UIL CALCULATOR APPLICATIONS DRILL MANUAL FOR STATED AND GEOMETRY PROBLEM PRACTICE

1200 Thematically Organized Stated and Geometry Problems

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PREFACE

This Drill Manual is offered as an aid to students preparing to compete in the UIL Calculator Applications Contest. The practice problems treat stated and geometry problems. A separate manual provides practice materials for the numerical or "number cruncher" problems. Together, these manuals offer an enormous amount of practice material covering the three problem types. It is our hope that these manuals will contribute to student progress and serve as a spring-board for establishing or enhancing the contestant-coach relationship.

This contest underwent a major revision starting with the 2004-05 contest year. Several new types of stated and geometry problems were added to the contest primarily to include pre-calculus and calculus. These problems include stated problems involving best-fit straight lines, limits, matrix algebra, derivatives, integrals, related rates, and maxima/minima. New geometry problems involve areas under curves and surfaces of revolution. Several problem forms have been formalized in the revised contest, including acceleration, trajectory and solver stated problems. The old approximation or starred "*" stated problems that allowed a ±10% in the final answer have been retired from the revised contest and are replaced by solver problems.

The primary goal in the production of this Drill Manual was to develop a tool which would be of use to contestants and their coaches. The more visible results of this effort are the thematic organization of problems for didactic purposes. Appendices to the companion Contest Manual include an exhaustive list of unit conversions and a formal formula set for geometry problems. It is our intent that these conversions and formulas will provide the assumed knowledge foundation for future stated and geometry problems, an exhaustive compendium of what we assume a student knows. This doesn't mean that we won't ask contestants on future contests to do unit conversions that are not on this list. It does mean that if we do, we will include the conversion factor explicitly or implicitly in the problem statement. While the formula list contains enough information to work geometry problems, this does not imply that some combination of these formulas might not be more useful for a specific geometry problem on a contest. The same is true for the unit conversions.

Last, I recognize the dedication and hard work of coaches all across this great state who have given their time, energy, resources and nurture to students who have chosen to compete in the Calculator Applications Contest. Whether you are a teacher, parent, friend or a combination of these, you perform a real service on behalf of your students. I hope that my effort in constructing these Drill Manuals is a similar investment of time and energy in service on your behalf and on behalf of the students you serve.

D.L.B.
January 15, 2004
Austin, Texas

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CHAPTER 1 - STATED PROBLEMS

INTRODUCTION

It is human to ask questions. Nowhere is this more apparent than in the myriad of questions little children ask, spanning the entirety of their experience. "When do we get to Granny's house?" "How long before bedtime?" "Can I have another donut?" As we mature, we don't grow out of this curiosity about the world around us. Perhaps our questions mature with us, or maybe the questions stay the same, and our ability to answer them improves with age. For example, the answer to the question, "When do we get to Granny's house?", approaches eternity to a small child! For an older sibling, reasonable answers might be, "A little while" or "About an hour". As some point, we knuckle down and do a calculation which may be based on all kinds of input depending on the accuracy we require, the car's velocity, how far away we are, whether in-transit stops are planned, the probability of a traffic jam, etc.

As our base of experience grows, so do the questions. We want to make sure that we get the correct change when we buy something. We stand in a long line and ponder how long it will take to get to the front. We want to get the best buy at the grocery store. Beyond this, we can hone our question-asking and question-answering skills further. What are the time-dependent locations of the sun, moon and planets? How much heat is generated in an electric utility powerline? How much load can a cable take before it breaks? How far it is to the opposite shore? At this juncture, we have moved through the portal of engineering, that discipline which deals with asking questions (problem stating) and answering them (problem solving).

There's a lot to this task of working with stated problems. Those who are involved with the discipline of engineering or the task of creating stated problems know that it's not easy to ask the right question, that is, one that can be answered. Formulation of an answerable question is an important part of the engineering endeavor. Furthermore, answering the question often requires a base of knowledge. For example, if I need to find the volume of a bucket, it helps to know the volume of a frustum. If I need to triangulate, it helps to know the rules of scalene and right triangles.

Probably the most challenging problems on the 70-problem UIL Calculator Applications Contest are the 21 stated problems. This notwithstanding, we are convinced that these problems are without a doubt the most interesting and satisfying problems as well. The 35 "number crunchers" require lots of skill and practice but relatively little thought, and the 14 geometry problems are generally worked in the abstract. What teaches more, figuring 3.75 + 4.99 - 2.68, or calculating the number of blue moons in a year? Which is more interesting, calculating the volume of a cone or figuring the capacity of a reservoir, or the volume of Mt. Fiji in Japan?

TYPES OF STATED PROBLEMS

Without getting too philosophical, one factor contributing to stated problem difficulty is that the approaches used to obtain answers often appear as broad and varied as the life experiences upon which the stated problems are based. The challenge of stated problems is converting or "translating" the written words into a mathematical equation which can then be solved. This requires lots of practice and lots of guidance. In the Contest Manual are detailed methods for approaching stated problems on the UIL Calculator Applications Contest. In summary, it involves reading the stated problem, quickly classifying it into a broad type of problem (like “unit conversion” or “related rate”), following the specific approach for that type to quickly obtain a solution, and writing the answer in the appropriate form. These problem types include: translation, unit conversion, rate, function, geometry, scaling, solver, best fit straight lines, matrix algebra, and calculus. In reality, many stated problems are combinations of two or more types, and all involve translation. However, the most successful approach almost always involves working the problem according to the method of just one of these types.

Translation problems involve an almost word-for-word switching from English to elements of a mathematical expression. "Is" becomes "=", "Thirty percent of what number" becomes "0.3x", etc. In unit conversion problems, the trick is to treat units (e.g., ¢, gallon, mile) as part of a numerator or denominator, and to multiply the fraction by "1/1" in the form of unit conversions such as "\$1/100¢", "128 oz/1 gal", "5,280 ft/1 mi", etc. Rate problems use some form of the rate equation, "distance = velocity times time". Sometimes we work with real distances, velocities and time, but as often as not these terms take on a nonconventional flavor. "Distance" could be a painted fence, a typed manuscript or a lawn to be cut. "Velocity" could be a typing speed, the flow of oil in a pipeline or the wattage of a light bulb. Two sub-groups of rate problems are acceleration problems and trajectories. Acceleration problems involve usually a constant acceleration instead of a constant velocity. Trajectories are acceleration problems applied to objects traveling without propulsion in the earth’s gravitational field. Function problems are comprised by equations describing a functional relationship between two or more items. Examples are compound interest, inflation rate calculations, exponential and geometric growth and decay, linear interpolation and extrapolation, percent, using logarithmic methods to deal with extremely large or small numbers, and problems dealing with the intersection of lines and curves on a two-dimensional coordinate plane. Geometry problems involve modeling something as a geometric figure. The earth becomes a sphere, a spotlight throws a cone of light, rooms have rectangular surfaces, and poles with cast shadows form legs of right triangles. Scaling problems rely on relationships between geometrically similar figures, or more exactly on obtaining answers using equations for which the constant of proportionality is not known. Solver problems exercise the calculator’s ability to solve transcendental equations, problems that have no direct algebraic solution. Best-fit straight line problems deal with (x,y) data and mean values of x and y, predicted values of y, best-fit straight line slope and intercept through the data and the correlation coefficient, a term that quantifies how close data points lie overall to the best-fit line. Matrix algebra problems deal with addition and multiplication of matrices and calculation of

determinants. There are several types of calculus problems, including derivatives, integrals, related rates, maxima and minima, and solids of revolution.

Here are typical examples of each stated problem type:

Translation — A positive number is doubled when it is added to 3.64 times its reciprocal. What is the number?

Unit Conversion — One omer is 1/10 ephah, and 10 ephahs make one homer. If a homer is 400 liters, how many omers are 2 quarts of flour?

Rate — My fountain fills in 4 hours with a garden hose. However, it takes 6.5 hours to drain by siphoning. How long would it take to fill if the siphon were operating?

Function — In 1970 the number of electrical engineering students at UT Austin was 1050, but was growing at a rate of 11 percent per year. During what year did the number of students pass 2,000?

Geometry — The Great Pyramid, constructed between 2590-2570 BC, is built from more that two million stone blocks, each of them twice the weight of a modern car. The base covers 13 acres and the height when built was 146.59 meters. Find the angle the face of the pyramid makes with the ground.

Scaling — A Mickey Mouse balloon has ears 2 inches in length after blowing into 8 times. How long will the ears be after 30 blows?

Solver — When does $3 \sin(x^2+7)$ equal $19x-6$ (x in radians)?

Best-Fit Straight Line — John loves to read books. The time (hr) needed to read a book with P pages is given for recent books read: (4 hr,212), (6 hr,325),(2.5 hr,125), (3.3 hr,175), (1.5 hr,80), (9.2 hr, 400). How long will it take John to read a 450 page book?

Matrix Algebra — . If $[\mathbf{A}] = \begin{bmatrix} 3 & 9 \\ 9 & 3 \end{bmatrix}$ and $[\mathbf{B}] = \begin{bmatrix} -2 & 6 \\ 6 & 1 \end{bmatrix}$, what is the value of C_{12} if $[C] = -2[A] + 3[B]$?

Calculus — A spherical balloon is inflated at a constant rate of 5 in^3/s. At what balloon diameter is the surface area changing at 3 in^2/s?

LAYOUT OF THE STATED PROBLEMS IN THIS MANUAL

This Drill Manual contains virtually all the stated problems from the years 2005 through 2009. They have been grouped by problem type. Because the most rapid path to a solution involves identifying the type of stated problem, it is important for contestants to be able to recognize and differentiate between the various types. Some problems are hybrid mixes of several problem types. One may be a rate and geometry problem, or there may be an integer function problem. These have been sorted into one category based on the primary emphasis of the problem.

Following all stated and geometry problems is a compilation of answers in chronological order. Stated problem answers are given in three-significant-digit, fixed notation, except occasionally when the answer is

exceptionally large or small. In most cases, equivalent rendering of the answer in scientific notation with three significant digits is equally acceptable. Exceptions are:

- Integer problems, in which the answer must be given in fixed format accurate to the "ones" place digit . Integer problems have "(integer)" in the answer blank.
- Dollar sign problems, where the answer must be written to the last cent. Dollar sign problems have "$" at the beginning of the answer blank.
- Significant digit problems, in which both fixed and scientific notation are allowed, but the number of significant digits may vary from the conventional three. Significant digit problems have "(SD)" in the answer blank.

The rules allow ±1 in the last significant digit in all cases, excepting integer problems. For more information on these various forms of stated problems, the reader is referred to the Contest Manual for the UIL Calculator Applications Contest.

LAYOUT OF THE STATED PROBLEMS ON THE CONTEST

Since 2005, there are ten problems on each of seven contest pages. On each page, stated problems are the sixth through eighth problems. Certain stated problems are placed in specific locations on the contest according to this format:

Page 1	6-8	Easy General Problems*
Page 2	16-18	Medium General Problems
Page 3	26-28	Medium General Problems
Page 4	36-38	Hard General Problems
Page 5	46	Scaling
	47	Best Fit Line
	48	Solver
Page 6	56	Calculus Basics
	57	Calculus Applications
	58	Matrices
Page 7	66-68	Problems from the Study List**

*General problems are translation, unit conversion, rate, function and geometry problems.
**The Study List is a compilation of 30 stated problems available from the UIL at the beginning of each contest year. They are generally the more challenging general problems from Page 4 of previous tests.

CHAPTER 2 - GEOMETRY PROBLEMS

INTRODUCTION

Geometry is probably the most visual branch of mathematics. It is as well perhaps the easiest way to model the world around us. We see a window and visualize a rectangle. We can find triangles in our sliced toast, hemispheres in our morning eggs (sunny-side up, of course), circles in our pancakes and a cylinder in the frozen orange juice container. All this, and we haven't even left the house yet! With a little perseverance, we can discover frustums of cones in our garbage cans, trapezoids in the neighborhood swimming pool, and cones on our pencil tips. We see a rectangle in the state map of Wyoming, an ant hill becomes a cone, and Nevada forms a trapezoid.

Best of all, we can use our knowledge of geometry to prick our intuitive curiosity about the world around us. For example, isn't a baseball "diamond" really a square? How much wall paper do I need to paper my bedroom? How much wood is needed to frame the picture I just bought? How much dirt is needed to fill a hole? How long does a goat leash have to be to give the goat an adequate grazing area? How far away is the horizon as a function of how high I am off the ground? We use geometry to find the height of buildings and trees, the span of rivers, the distance to the moon and sun, the capacity of grain elevators and storage tanks and an approximation for pi.

Geometry pervades engineering and the sciences since these fields particularly are given to understanding the world we live in and to altering our environment for the benefit of all. Therefore, it is fitting that geometry plays an important role in the Calculator Applications Contest, the "pre-engineering" vehicle of the UIL academic contests. This compilation of practice materials is designed to enhance contestant proficiency in quickly and accurately solving geometric problems as they appear on UIL Calculator Applications Contests.

FORMAT OF GEOMETRIC PROBLEMS IN THIS MANUAL

Coverage includes trigonometry, plane geometry, solid geometry, and calculus. The geometry practice problems in this Drill Manual were reproduced from the 2005 through 2009 UIL contests. The problems in this drill manual are grouped by the type of geometric figure involved. Starting with simple figures such as circles and right triangles, the problems progress to solid geometric figures and combined, multiple plane and solid shapes. Towards the end, there are two types of geometry problems new to the contest in 2005 that involve calculus. These involve mainly areas under curves and volumes of solids of revolution.

FORMAT OF GEOMETRIC PROBLEMS ON THE CONTEST

Each Calculator Applications Contest contains 14 geometry problems, the last two problems on each contest page. Geometry problems follow a specific format described in detail in Chapter 5 of the companion Contest Manual and reproduced here. The two Page 7 geometry problems are similar in difficulty to the non-calculus Page 6 problems (Problem #60). They come from an annually produced study list available from the UIL which consists of 20 geometry problems.

Page 1	9-10	Simple, One-Step Non-Triangular Shapes
Page 2	19-20	Right Triangles
Page 3	29-30	Simple, One-Step Solid Geometry
Page 4	39	Triangles with Inscribed or Circumscribed Circles
	40	Law of Sines and/or Law of Cosines
Page 5	49-50	Medium Solid Geometry
Page 6	59	Calculus
	60	Difficult Plane Geometry
Page 7	69-70	Problems from the Study List*

*The Study List is a compilation of 20 geometry problems available from the UIL at the beginning of each contest year. They are typically the challenging Page 6 plane geometry problems from previous years' contests.

Translation Problems

05A-6. What is the average of 45.7, 93.2 and 14.9? ----- 6=

05B-6. What is the square root of the product of 34.6 and 6.3^3? ---------- 6=

05D-6. What is 24.9 minus e^2? ---------- 6=

05E-6. What is 35.6% of the sum of 12.8, 21.4 and 16.5? ---------- 6=

05H-6. If 18.4 times the cube of a number equals -345.9, what is 3 times the number? ---------- 6=

06A-6. What is 753 divided by -3.75? ---------- 6=

06B-6. What is the remainder of 5,620 divided by 18.7? ---------- 6=

06C-6. What is the average of 465, 35 and 905? -------- 6=

06D-6. What is the sum of 0.224, 0.328 and π? --------- 6=

06E-6. What is the product of 3.96 and 736? ---------- 6=

06G-6. What is the positive difference between 412 and 215? ---------- 6=

06H-6. What is the sum of 2.52, 5.64 and 25.1? -------- 6=

06I-6. What is the product of 7.62, 46.6 and 13.4? ---- 6=

07B-6. What is the average of 80.4, 883 and 913? ------- 6=

07C-6. What positive number equals 0.0595 times its reciprocal? ---------- 6=

07F-6. What is the positive difference between 21.1 and 6.06? ---------- 6=

08A-6. What is the remainder of 8410 divided by 6.61? ---------- 6=

08B-6. What is the reciprocal of the product of -86.4 and 76.7? ---------- 6=

08C-6. What is the positive square root of the product of 597 and 3.65? ---------- 6=

08D-6. What is the average of 39.4, 81.7 and -54? ----- 6=

08E-6. What is π^{π} divided by 77? ---------- 6=

08G-6. What is the reciprocal of the square of the product of 0.0748 and -8080? ---------- 6=

08H-6. What is 596 times $4.96^{2.07}$? ---------- 6=

09B-6. What is 100 subtracted from 25 times pi? ------- 6=

09E-6. What is the square of the product of 4.56 and 7.65? ---------- 6=

09F-6. What is 3 minus the product of 0.36 and pi? ---- 6=

09G-6. What is the result of multiplying 38 and the square root of 945? ---------- 6=

05G-7. On October 14, 1947, Chuck Yeager was the first person to break the speed of sound. He flew 700 mph, which is 6% higher than the speed of sound

at the altitude of his flight. What was the speed of sound at this height? ---------- 7= ft/s

05H-7. A talent is 75 pounds. If King Solomon's annual receipts on gold were 666 talents and gold is worth $380/troy ounce, what is his income in millions of dollars/year? 175 troy ounces equals 12 lbs. ------- 7= M$

05I-7. What is the result of subtracting seven from the reciprocal of five pi? ---------- 7=

06A-7. What is the positive square root of the product of 52.9 and 6.22? ---------- 7=

06B-7. What is the product of 302 and $(7\pi - 4)$? -------- 7=

06C-7. What is the cube of the product of 9.2 and 0.869? ---------- 7=

06D-7. What is the average of the positive $\sqrt{5350}$, 8.46 and 3.35? ---------- 7=

06E-7. What is 59 minus the cube root of 51.3? --------- 7=

06F-7. Calculate the absolute value of the difference between -1.7 and 2.46. ---------- 7=

06G-7. Given 0.873 and 12.6, what is the product of these numbers minus their sum? ---------- 7=

06H-7. Calculate the average of $\ln(25\pi)$, $8.1^{1.7}$ and 69.7. ---------- 7=

06I-7. What is the remainder of 6150 divided by $(2\pi-0.96)$? ---------- 7=

07A-7. What is the sum of 3π, π^{π}, and π^3? ---------- 7=

07C-7. What is the square root of the product of 47.4 and 3.02π? ---------- 7=

07H-7. What is the remainder if 5620 is divided by 69.2? ---------- 7=

08A-7. Fred purchased $3.29 worth of tuna salad at $4.99/lb. How much did he buy? ---------- 7= oz

09A-7. Barry averaged 86.4 on the first three of five tests. If each test is weighted equally, what must he average on the last two tests to get a 90 average overall? ---------- 7=

05A-8. The birth rate in Bulgaria was 42 per 1000 in 1908, was 35 per 1000 in 1923, and was 21 births/1000 in 1962. Based on these data, predict the births/thousand in 1980. ---------- 8= birth/1000

05B-8. By what amount does the cube root of one thousand need to be increased to equal the square root of five hundred? ---------- 8=

05C-8. Find the average of 101^2, 102^3 and 103^4. ------ 8=

05D-8. Munich in 1961 has a population of 2,754,704 and an area of 6,308 sq. miles. What is the average area per person? ---------- 8= ft^2/pers

05F-8. A string 10 meters long is cut such that the ratio of the pieces is 1:π. What is the positive difference between the shorter piece and half the longer piece? ------- 8= _____ m

05G-8. What is the average of the four digits in 2005? ----- 8= _____

06A-8. A loaded filing cabinet has four drawers and weighs 175 lbs. What is the average weight of each loaded drawer? ---------- 8= _____ lbs

06F-8. What percentage of a deck of cards with jokers is spades? ---------- 8= _____ %

07A-8. What is 65% of the sum of 386 and 5(19.7)? ---------- 8= _____

07D-8. What is Mary's test average if her test scores were 95, 65, 83, 89 and 90? ---------- 8= _____

07F-8. What is the remainder after dividing 7340 by 31.8? -- 8= _____

07G-8. Find x (positive) if x equals the reciprocal of πx. ---------- 8= _____

08A-8. Joey and his friends each estimate the number of seats in the school cafetorium to be 275, 350 and 225. What is the average of their estimates? ---------- 8= _____

09B-8. An ipod costs $249 on-line and weighs 5.7 oz. What is the ratio of the cost per unit mass of an ipod and silver, which is $17.50/oz? ---------- 8= _____

09F-8. Estimate the weight of the Mitchell-Hedges Crystal Skull of Lubaantun. It measures 5 in high, 5 in wide and 7 in long and is made of pure quartz which has a density of 0.0957 lb/in^3. Assume that the skull occupies 70% of the rectangular volume. ---------- 8= _____ lbs

09H-8. A popular cookie has 50 calories. If there are 66 cookies in a package, and 3500 calories intake equals one pound of weight, how much extra weight would a person put on by consuming an entire package? ---------- 8= _____ lbs

05C-16. What negative number is 6.8 times the negative square root of the negative of its reciprocal? ---------- 16= _____

05D-16. What number greater than one, when added to its reciprocal equals 10? ---------- 16= _____

06B-16. A highway sign read, "Austin 117 miles, Temple 186 miles". Later, a sign showed Austin to be 84 miles away. How far was Temple from this second sign? ---------- 16= _____ mi

06C-16. Mike has scores of 75 and 68 on two of three tests. What must he make on the third test to have an average test score of 80? ---------- 16= _____

06E-16. What number must be added to the numerator and subtracted from the denominator of 457/1390 to obtain 1/π? ---------- 16= _____

06I-16. In a group of 250 people, 108 were women, and 15 were left-handed men. Of the men in the group, what percent are left handed? ---------- 16=_____ %

07A-16. If Amanda has test scores of 88, 92, 89 and 85, what must she make on the last test to average 90? ---------- 16=_____

08D-16. A school class meets 45 minutes daily, and there are 75 meetings in a semester. If a teacher is 2 minutes late each class period getting class started, how many class periods are effectively lost in a semester? ---------- 16=_____

08G-16. What number when added to the numerator and denominator of 3/8 yields $-\pi$? ---------- 16=_____

09F-16. The world population in 2007 was 6,602,224,175. Assuming you weren't born on a leap day, how many people on average share your birthday? -- 16=_____

05B-17. A hearing aid battery lasts 20 days. Knowing that a hearing aid is turned off 8 hours at night, how many hours is the lifetime of such a battery? ------ 17=_____ hr

05C-17. In my Bible, the Old Testament begins on page 6 and ends on page 1429, and the New Testament begins on page 1439 and ends on page 1950. What percent of the Bible is in the Old Testament? ---------- 17=_____ %

08G-17.Robert bought a car. Insurance is $120/mo, and gas is $3/gal. If he gets 18 mi/gal, how far can he drive each week if his annual budget for driving is $2500? ---------- 17=_____ mi

08H-17.Assuming 365 days per year with 5 work days per week, how many work days on average are in a year? ---------- 17=_____ days

09A-17. If Jessica works a 40-hour week, what is her work time divided by the total elapsed time of a week? ---------- 17=_____ %

05B-18. A "semester credit hour" is the standard unit of college credit and consists of meeting in class one hour/week for 17 weeks plus a three hour final exam. If the students must spend two hours out of class study for each hour in class, and the preparation time for the final exam is 10 hours, how many hours of the student's life are spent to gain one semester credit hour? ---------- 18=_____ hr

05H-18. We are doing organic gardening by spraying natural pesticides on the plants. I just sprayed 4 fl. ozs of homemade citrus oil added to 1/2 gallon of water, to control mosquitoes. What is the percent of the active materials in the spray if 90% of the citrus oil is water? ---------- 18=_____ %

06I-18. "Star Wars: Episode III - Revenge of the Sith," grossed $50 million dollars in 3700 theaters on its opening day. If the average ticket price was $7.50, how many people saw the movie in a single theater? ---------- 18=_____

08E-18.A home owner can buy an air conditioner compressor for $500 that costs $350 to run annually. If a high efficiency air conditioner costs $1000 and saves $160 annually in operating costs, what is the break-even time for these units based on cost? -------- 18=_____ yr

09G-18. Israel became a nation in modern times on May 14, 1948. How old was Israel on January 1, 2009? ----- 18=_____ days

09I-18. Pet Rocks were a 1970s fad conceived by Gary Dahl. In the six months of the fad, Dahl netted one million dollars. If the rocks sold for $3.95 each and the cost to produce them was $1.55, how many were sold? ---------- 18=_____

07C-26. What number, when added to the numerator and denominator of 37/54, changes the value of the fraction to $-\pi$? ---------- 26=_____

09B-26. If xy = 19 and x-y = 15, what is the absolute value of x+y? ---------- 26=_____

05A-27. The newsstand price of a certain magazine is 60% higher than the price on the basis of a one year subscription, but the five-year subscription price is 30% less than the on a one-year basis. What is the newsstand price divided by the annualized five-year subscription price? ---------- 27=_____

08C-27. A backpacker is advised to carry 6 quarts of water for each day of her trip. If the trip is 3 days, and her backpack weighs 50 lbs, what fraction of her pack weight is water? ---------- 27=_____ %

06B-28. A restaurant claims to have sold 100 billion hamburgers. There are 4 oz of beef on each hamburger. If there are 450 lbs of usable meat on a cow, how many cattle were slaughtered to get this much beef? ---------- 28=_____

08E-28. The moon makes 1 cycle around the earth in 28 days. On average, how many “blue moons” are there in a non-leap year? A blue moon is a second full moon in a calendar month. ---------- 28=_____

05C-36. Interstate 20 has three lanes for traffic and the speed limit is 70 mph. If cars are on average 12 ft long, and the “two second” rule is obeyed (the distance between cars corresponds to two seconds at the velocity they are traveling), what is the maximum road occupancy for vehicles driving the speed limit? --- 36=_____ veh/hr

08B-36. For what value of z does the sum of the natural and base ten logarithms equal 125? ---------- 36=_____

06G-38. On average, a family fills a 2 ft by 2 ft by 5 ft trash container every week. If an average family is 3.7 people, and a town has a population of 5000 people, what is the town’s annual volume of uncompacted trash? ---------- 38=_____ ft^3

Unit Conversion Problems

05F-6. A barrel of oil is 4.211 cubic feet. How many gallons is that? ---------- 6= _____ gal

05G-6. What is the span of a football field (100 yards) if a span is 9 inches? ---------- 6= _____ span

07B-7. If a digital song is on average 5.4 megabytes, how many songs fit on a 40 gigabyte ipod? Assume that a gigabyte is 1000 megabytes. ---------- 7= _____ songs

07F-7. How many hours are in a week? ---------- 7= _____ hr

07G-7. How many inches are in a mile? ---------- 7= _____ in

08I-7. A circular field occupies 6 acres. What is the radius? ---------- 7= _____ ft

09F-7. Diane gained 31 lbs during her 40-week pregnancy. What was her average daily weight gain? --- 7= _____ oz

06C-8. What is 36 inches divided by 1 meter? ---------- 8= _____

06E-8. How many millimeters are in a mile? ---------- 8= _____ mm

07H-8. If a moon cycle is 28 days, how many moon cycles are in a non-leap year? ---------- 8= _____ cycles

08C-8. How many cm are in 1 mi? ---------- 8= _____

09A-8. Machu Picchu is a pre-Columbian Inca site located 2,400 meters above sea level. What is this elevation in feet? ---------- 8= _____ ft

09I-8. The Tangjiashan “quake” Lake in China was created by the devastating earthquake of 2008. The lake swelled to 170 million cubic yards which, according to one news source, was 50,000 Olympic-sized swimming pools. Based on this, what is the capacity of one Olympic-sized swimming pool? ---------- 8= _____ ft^3

05A-16. A dog barks once every 2.3 minutes during 45% of a day. How many times does the dog bark in a week? ---------- 16= _____

05B-16. A virus is 22 Angstrom units long. If there are 10 Angstroms in 1 nanometer, what is this length in micro-inches? ---------- 16= _____ µin

07H-16. What is the area covered by a 12 ft by 15 ft rug? ---------- 16= _____ m^2

08E-16. If an average tree covers 130 ft^2, how many trees are in a 100 acre forest? ---------- 16= _____

08H-16. The largest tea party was 14,718 people who drank green tea in Nishio, Japan on October 8, 2006. If a serving was 6 oz, how much tea was needed? ------- 16= _____ gal

06A-17. 3950 reams of letter-sized (8.5 in x 11 in) paper can be produced from one tree. How many legal-sized (8.5 in x 13 in) reams could be produced from the same tree? ---------- 17= _____ reams

06B-17. A rectangular field is 3.6 acres. One side is 450 ft long. What is the length of the other side? ---------- 17= _____ ft

06C-17. A fingernail grows 1 cm in 26 weeks. How much growth is this in one hour? ---------- 17=_____ µm

09E-17. If a light-second is 186,000 miles, how many nanometers are there in a light-second? ---------- 17=_____ nm

09I-17. A can of root beer is 12 oz. How many cans could a person get from a 3-liter bottle? ---------- 17=_____

06H-18. If a penny weighs 2.4875 grams, what is the weight of $10,000 worth of pennies? ---------- 18=_____ lbs

07D-18. There are 20 minims in a scruple. If a minim is 0.0592 cm^3, how many scruples are in a gallon? ---------- 18=_____ scruples

09E-18. In May 2008, a wildfire burned 4,000 acres near Santa Clara, California. How many Super-Walmarts does this area equate to if a Super-Walmart is 100,000 square feet? ---------- 18=_____

05I-26. On November 11, 1935, Captains A. Stevens and O. Anderson of the US Army set a new altitude record for balloons, reaching a height of 13.71 miles in a balloon of volume 3,700,000 cubic feet. What is the height of the ascent divided by the diameter of the balloon, considered a sphere? ---------- 26=_____

07B-26. Bulk aluminum sells at $0.85/lb. A roll of aluminum foil has 75 ft^2, is 0.0008 in thick and sells for $4.09. If the density of aluminum is 2.86 g/cm^3, what is the ratio of the foil cost/lb to the bulk cost/lb? ---------- 26=_____

07F-26. An ingot of aluminum weighs 10,000 lbs. How many rolls of aluminum foil can be made from this ingot? Rolls are 2 ft wide and 100 ft long, and the foil is 0.0008 in thick. The density of aluminum is 2.86 g/cm^3. --- 26=_____

09H-26. If one hectare is 10,000 m^2, how many acres are there in one hectare? ---------- 26=_____ acres

09G-27. The average annual consumption of chocolate in the US is 6.5 kg per person. This amounts to a person eating a standard 1.55 oz chocolate bar once in how many days? ---------- 27=_____ days

08H-28. Highway center stripes are 8 in wide, 10 ft long and 30 ft apart. If a gallon of paint covers 250 ft^2, how many gallons of paint are needed to paint the 48 mi long road center stripe between Big Springs and Snyder? -------- 28=_____ gal

Rate Problems

The Rate Equation

07E-6. How far does a car traveling at 48 mph travel in 2.5 hours? ---------- 6=_____ mi

05F-7. On December 17, 1903, the Wright brothers achieved powered flight by flying 120 ft. The airplane was in the air 12 seconds. What was the average speed of the aircraft? ---------- 7=_____ mph

08B-7. Beth decides to grow out her nails. If the growth rate is 1 cm/26 weeks, how long will it take her nails to extend by 0.3 in? ---------- 7= weeks

08C-7. Human reaction time is about 150 microseconds. How far does light travel in this time if its velocity is 186,000 mi/s? ---------- 7= mi

08H-7. Alison took 8 hr to read a 230 page book. How long did it take to read one page? ---------- 7= min

09G-7. Josie averaged 58 mph on her 200 mile trip. How long did the trip take? ---------- 7= min

06D-8. How far does a car traveling at 55 mph go in 2.5 hrs? ---------- 8= mi

06G-8. A CD spins at 500 RPM. What angle is swept out in 10 milliseconds? ---------- 8= deg

07B-8. How many 8-hour shifts must Gabby work to earn $500 if she makes $7.50/hr? ---------- 8= shifts

08B-8. Marsha works 14 hours per week at $6/hr. She gets a new job making $6.50. How many hours per week should she work at the new job if her income does not change? ---------- 8= hr

08D-8. A car tire is 28 inches in diameter. What is its rotational velocity when the car is traveling at 35 mph? ---------- 8= RPM

09E-8. Frank runs a mile in 7 min 25 sec. What is his time in a 26.22 mile marathon if his velocity decreases by 10%? ---------- 8= hr

05I-16. Lake Buchanan near Austin filled during the rains of June 2004. The lake volume was 843,065 acre-ft, and the elevation was 1018 ft. The dam release was 3268 cubic ft/sec. How long would it take to completely drain the lake? ---------- 16= hr

06H-16. Light travels at 186,000 mi/s, and human reaction time is about 200 msec. How far does light travel in this time? ---------- 16= mi

07C-16. A runner burns 704 calories/hr running at 6 mph and 1056 calories/hr at 9 mph. What is the percent error in the interpolated energy consumption rate at 8 mph if the actual value is 950 calories/hr? -- 16= %

09H-16. A song lasts 5 min 35 sec at a tempo of 90 beats per minute (bpm). What is the new tempo if the song needs to be finished in exactly 5 minutes? ------- 16= bpm

07A-17. If a bicycle tire is 28 inches in diameter and a biker travels at 28 mph, what is the tire rotational velocity? ---------- 17= RPM

07D-17. Sam works 18 calculator problems in an hour, and Elisa can work 24 problems in an hour. How long does it take them to work 560 problems if Elisa worked alone for the first 2.5 hrs? ---------- 17= hr

07G-17. How much soccer must a person play, consuming 704 calories/hr, to compensate for eating two donuts if each has 295 calories? ---------- 17= min

07H-17. Marissa biked at 20 mph for 42 min and then hiked 2 hours at a 12 minute mile pace. How far did she travel? ---------- 17=_____ mi

08A-17. If the average heart rate is 75 beats/min, how far does sound travel in one heartbeat? The speed of sound is 769 mph. ---------- 17=_____ ft

08I-17. If the average heart rate is 80 beats/min, how many times has the heart beat for a teenager on her 16th birthday? Assume that the heart starts beating 33 weeks prior to birth. ---------- 17=_____ beats

09G-17. Don breathes 22 times every minute, and his rest pulse is 64 beats per minute. How long does it take for his heart to beat 1000 times more than the number of breaths he took in the same time interval? ---------- 17=_____ hr

05F-18. In driving between Austin and Dallas, 80% of the distance has a 70 mph speed limit, 15% has a 65 mph speed limit, and the rest is 60 mph speed limit. If the distance is 192 miles and a driver drives 5% over the speed limit, what is the travel time? ---------- 18=_____ hr

06F-18. How far from the center of a wheel spinning at 200 RPM must an ant stand if its speed is 15 mph? --------- 18=_____ in

07E-18. Joey runs at 6.8 mph, and Jane runs 1 mile in 9 min 35 sec. How far apart are they in 35 min if they run away from each other? ---------- 18=_____ mi

08G-18. The shutter on a digital camera moves 0.05 inches to open and 0.05 inches to shut when a photo is taken. At an exposure of (1/4000) second, 10% of the exposure is associated with opening and closing of the shutter. What is the average velocity of the shutter? ---------- 18=_____ mph

09B-18. The tortoise crawls at 2 ft/min and the hare hops at 5 ft/sec. If the tortoise just wins a mile-long race, what fraction of the race time did the hare stop and rest? ---------- 18=_____ %

05F-26. The lamp on a lighthouse rotates one revolution every 40 seconds. What is the velocity of the light spot 0.83 mi from the lighthouse? ---------- 26=_____ mph

06B-26. A roulette wheel is 30 inches in diameter. Several people play the game inside a van moving at 20 mph. The speed of the wheel edge relative to the ground is higher on the left side of the van than the right side since the wheel is spun clockwise. What is the wheel RPM if the ratio of maximum ground speed to minimum ground speed is 2.2? ---------- 26=_____ RPM

06E-26. Wanda walks a mile in 15 minutes but runs one in 7.5 minutes. How far does she walk if she covers one mile in 10.7 minutes? ---------- 26=_____ ft

05C-27. When the “changes” are rung on a group of bells, the number of changes is the factorial of the number of bells, n!. If a change can be rung on 4 bells in 1 minute, how long does it take the ring the changes on 8 bells? ---------- 27=_____ hr

06G-27. Betty drove to her mom's house at 55 mph and returned home at 70 mph. What was her average velocity for the trip? ---------- 27=_____ mph

07A-27. Two cars have a relative velocity of 85 mph when driving directly toward each other. If one car's velocity is 45% of the others, what is the faster car's velocity? ---------- 27=_____ mph

07G-27. A high-pressure water sprayer operates at 2 gal/min. If the diameter of the opening on the nozzle is 0.025 in, what is the velocity of the spray? ---------- 27=_____ mph

08A-27. In Longview TX, water evaporates at the average rate of 56 nanometers per second. The average annual rainfall is 47.8 in. How much water must be added (positive) or subtracted (negative) annually to maintain a constant level in a rain gauge? ---------- 27=_____ in

09A-27. Ursula can walk to school in 58 min. When she rides the bus, it takes 13 min. If the bus average velocity is 17 mph, how long on average does it take Ursula to walk 1 mi? ---------- 27=_____ min

05E-28. If we drive IH35 at an average speed of 65 mph, it takes one hour and fifty minutes to reach our kid's house. We prefer the back roads, which are 20% longer, even if it takes us 45 minutes more. What is our average speed on the back roads? ---------- 28=_____ mph

05H-28. A Hunter fan has 4 blades that are 52 inches long (from the axis) and turns 50 rpm. What is the relative speed between the tips of opposite blades? ---- 28=_____ ft/s

06D-28. Roger proofs 2 pages/min, and Ruth Ann proofs 2.6 pages/min. Roger started proofing a 800-page manuscript. After an hour, Ruth Ann joined him and they finished together. How long did they work together? ---------- 28=_____ min

06G-28. How long after exactly 5 O'clock do the hour and minute hands of a watch align? ---------- 28=_____ min

07C-28. Beth types 60 words per minute (wpm), and there are 350 words on a page. She typed for 4 hours on a 150 page book before being joined by Sandy. They finished the book working together for 6 additional hours. What is Sandy's typing speed? ------- 28=_____ wpm

07G-28. A clock face reads exactly 3:45. How long will it take the minute hand to align with the hour hand? ---------- 28=_____ min

08D-28. Vasilii Hazkevich covered 13,172 miles on an unmodified tractor between April 25 and August 6, 2005, starting and finishing in Vladimir, Russia. Assuming he rode 30% of the time, what was his average speed? ---------- 28=_____ mph

09A-28. Bradley leaves Brownfield traveling north at 66 mph. After 42 min, Brenda leaves Brownfield

traveling east at 55 mph. How far apart are they when Brenda gets to Tahoka, 28 mi from Brownfield? ---- 28=_____ mi

05E-36. A 4-ft high picket fence is being built. The builder adds 5 ft^2 in 20 minutes. When the fence is 20 ft long, a painter starts painting the fence at a rate of 8 linear feet of fence per hour. How long does it take for the painter to catch up with the builder? ---------- 36=_____ hr

05F-36. Driving from Austin to Dallas, we got 28 mpg at 70 mph due to a 30 mph wind from the south, but on the return trip we got only 20 mpg at 70 mph because we went directly into that wind. If $mpg = c_1 + c_2 v^2$ where c_1 and c_2 are constants and v is the speed of the automobile relative to the air, what is the mileage at 70 mph in still air? ---------- 36=_____ mpg

05G-36. The distance from the pitcher's mound to home plate on a baseball diamond is 60 ft 6 inches and the ball is released 24 inches in front of and 60 inches above the pitcher's mound, which is 10 inches above the playing field. If the pitch travels 90 mph, how long does it take from release to the middle of the strike zone, 36 inches above the home plate? ---------- 36=_____ s

06C-36. Ants add 10 in^3 of dirt to their conically shaped mound every 3 hr. The mound diameter is twice its height. How long would it take to grow the mound from a height of 5 in to a height of 8 in? ---------- 36=_____ days

06G-36. Light travels at 186,000 mi/s, and sound travels at 1130 ft/s. A thunderclap was heard 6 seconds after seeing the lightning strike. How far away was the lightning strike? ---------- 36=_____ mi

07I-36. The moon makes a complete cycle around the earth every 28 days. If the moon rose at 8 PM one day, how long after 8 PM does it rise the next day? ---- 36=_____ min

08E-36. A painter needs to paint a building in 8 hr, but working alone takes 12 hr. How long after starting the job should he bring in a second painter working at the same pace? ---------- 36=_____ hr

08H-36. How long after exactly 7:44 PM do the minute and hour hands align? ---------- 36=_____ min

05E-37. An hourglass is turned over, and it would take an hour for all the sand to move from the top to the bottom chamber. At what time should it be turned back such that all the sand is back in the original chamber in 100 minutes? ---------- 37=_____ min

05F-37. An hourglass is shaped as two identical inverted cones, and sand fills half of the hourglass volume. What is the rate at which the level of sand is increasing in the bottom chamber if the level of the sand in the top chamber is decreasing at a rate of 0.5 inch/hour? ---------- 37=_____ in/hr

06E-37. The burn rate of a candle is 0.7 in^3/hr. If a tapered candle is 0.25 inches in diameter at the top, 1 inch in diameter at the bottom and 10 inches long, how long does it take to consume 80% of the length? ---------- 37=_____ hr

07B-37. In a dodgeball game, a player throws a ball in an attempt to hit a person 30 ft away. If the ball is thrown at 38 mph and a person's move reflex takes 150 ms to initiate, how much time does the person have to "dodge" the ball? ---------- 37=_____ ms

07F-37. It is exactly 6:05 PM on a clock. How much time has elapsed when the minute hand lines up the third time with the hour hand? ---------- 37=_____ hr

07H-37. Don peels an orange in 45 s, and Daniel can peel one in 56 s. Don starts peeling 500 oranges at 8 AM, and after a time t, Daniel joins him. They work together, finishing peeling all oranges at 2 PM. What is t? ---------- 37=_____ min

08E-37. A hiker and a jogger start out together on a 5 mi long trail. The jogger runs a mi in 8 min 10 s, and the hiker travels at 2.5 mph. When the jogger got to the end of the trip, she turned around and ran back to the hiker. She then reversed direction again, heading back towards the end of the trail. This continued until the hiker finished the trail. How far did the jogger run? ---------- 37=_____ mi

08F-37. Marie starts a project at a rate to finish in 5 hr. After 2 hr, her rate decelerates such that she finishes 6.3 hr after starting. What was the deceleration rate, a negative number? ---------- 37=_____ $proj/hr^2$

09A-37. How long after 7:30 are a clock's minute hand and hour hand 50° apart? ---------- 37=_____ min

05C-38. On an analog watch, the minimum and maximum distances between the tips of the hour and minute hands are 0.1 and 0.96 inches, respectively. What is the distance between the tips at 1:15 PM? ---------- 38=_____ in

05I-38. It takes me 25 minutes to walk home, but my riding time home is only 10 minutes if my wife comes and picks me up in the car. If I start walking and she starts driving 5 minutes later, how long before I get home from the time she meets me en route? ---------- 38=_____ min

06B-38. It takes Sam 12 hr to scrape the paint from a fence, but Harold can do the job in 9 hr. How long does Sam work alone before being joined by Harold if they finish the job working 3 hr together? ---------- 38=_____ hr

06F-38. A slow runner runs a 1/4 mi lap in 2.5 min, while a fast runner covers that distance in 1 min 38 sec. Once, they started running from Point O on an oval track in opposite directions. When the fast runner met the slow runner, he immediately reversed direction and raced back to Point O. There, he again reversed direction, running until he met the slow

runner again. This continued until the slow runner completed one lap, returning to Point O. How far did the fast runner run? ---------- 38=_____ ft

08F-38. A non-stop flight leaves Tokyo, Japan at 11:30 AM (Japan time) and arrives in Dallas at 9:05 AM (Dallas time) the same day (!). Dallas is 9 time zones later than Tokyo, but you have to subtract one day since the International Date Line was crossed. If the distance between cities is 6461 mi, what is the plane's average ground speed? ---------- 38=_____ mph

09H-38. A 6-ft board pivots like a seesaw but with the pivot 12 in from one end. The board end closest to the pivot is threaded and screwed on to a vertical threaded shaft which is fixed to the ground and rotates at 130 RPM. If the other end of the board moves with a velocity of 2 in/sec when the board is horizontal, what is the shaft thread (thd) pitch? ----- 38=_____ thd/in

09I-38. How long after 10:55 does the minute hand of a watch cross the hour hand the second time? ---------- 38=_____ min

Acceleration

07F-18. The Leaning Tower of Pisa is 55.9 m tall. How long did it take for Galileo's stone to fall to the ground? ---------- 18=_____ sec

08B-26. Toni steps off a 10 meter board and falls into a swimming pool. What is her (positive) velocity at impact? ---------- 26=_____ mph

05C-37. The velocity of a car increases with time at $v(t) = 12t$ mph, where t is in seconds from the time the car began moving. How long before the car is 100 ft from where it began? ---------- 37=_____ sec

05D-37. The velocity of a car can be approximated by the equation $v(t) = 60\left(1 - (t - 20)^2 / 400\right)$ mph where t is in seconds. What is the acceleration at t = 0 in ft/s^2? ---------- 37=_____ ft/s^2

08D-37. The 2007 Ford Mustang accelerates from 0 to 60 mph in 7.6 s. Assuming constant acceleration, how long would it take to accelerate from 0 to 30 mph? ---- 37=_____ s

09B-37. A water park has diving platforms that are 20 ft and 5 ft above the water. How long after a person steps off the tall platform should a person step off the short platform if they hit the water simultaneously? ---------- 37=_____ sec

05F-38. Sam wants to drive the speed limit but when he gets to talking, his speed creeps up. If he starts at 60 mph and his speed creeps steadily up to 70 mph in 30 seconds, how much distance does he cover in those 30 seconds? ---------- 38=_____ ft

07E-38. A new riveter on an assembly line "pops" or installs rivets starting at 40 rivets/hr. They speed up as they become more proficient, popping 48 rivets/hr after one hour's work. Assuming constant

acceleration, how many rivets are popped by a new riveter in their first 8-hour day? ---------- 38=_____ rivets

08A-38. A car accelerates from rest, drives a certain distance at 60 mph, and then decelerates to rest. Acceleration and deceleration have equal magnitude but opposite sign. If the total distance traveled was 18 mi and the total elapsed time was 20 min, what was the (positive) acceleration? ---------- 38=_____ ft/s^2

08B-38. A red car accelerates from rest at 900 mph/hr to velocity of 35 mph. Three seconds later, a blue car accelerates from the same point in the same direction at 450 mph/hr, to a velocity of 45 mph. How long must the blue car travel at 45 mph to catch up with the red car? ---------- 38=_____ min

09G-38. During a footrace, a fast runner runs at a 6 min/mi pace, and a slow runner runs at a 7 min/mi pace. The fast runner passes the slow runner. After a 2 sec delay, the slow runner initiates an acceleration, catching up with the fast runner in 968 ft. What is this acceleration? ---------- 38=_____ ft/s^2

Trajectory Problems

05I-8. A baseball player throws a ball with a release velocity of 110 ft/s from deep center field to home plate. The ball travels horizontally 350 ft and is in the air 3.75 s before striking the ground to bounce to the catcher. What is the angle at which the ball was thrown relative to the ground? ---------- 8=_____ deg

08H-26. The world record height for a jump by a pig is 70 cm. How long was the pig aloft? ---------- 26=_____ s

08I-36. A projectile's maximum vertical elevation is 57 ft and it lands 250 ft away. What is the angle of release relative to the ground? ---------- 36=_____ rad

09G-36. In an egg toss, a strategy is to throw the egg with the lowest possible velocity but still cover the distance to the catcher. If the catcher is 25 ft from the thrower, what is this velocity? ---------- 36=_____ ft/s

08C-37. A municipal firework is fired, traveling 350 ft into the air. It then free falls to an elevation of 250 ft, at which point it is detonated. If the fuse is 6 in long and burns at a rate of 0.4 in/s, how long after lighting the fuse should the firework be fired? ---------- 37=_____ s

08G-37. A firework travels straight up to a maximum height of 270 ft before exploding. What was the release velocity? ---------- 37=_____ mph

08H-37. A projectile is fired at 50 ft/s and hits a target 60 ft away. The firing angle may be either less than 45° or greater than 45°. What is the positive difference in time of flight for these two paths? ---------- 37=_____ s

09H-37. Erica stands 20 ft away from a 10 ft tall wall. She throws a ball at a release height of 4 ft that just clears the wall. What is the ball release velocity? ----- 37=_____ fps

05B-38. A No. 5 iron (golf club) launches the ball at an angle of 32° relative to the horizontal, and a No. 9 iron at 78°. If the launch velocity is in the ratio 3:1, what is the ratio of horizontal, first-bounce distances for the flight of the balls on level ground?---- 38=_____

07C-38. A gun fires a bullet at 500 mph. What is the bullet's maximum range, the farthest horizontal distance it can travel? ---------- 38=_____ mi

08E-38. Dan runs away from Dana at 14 mph. Dana throws a ball at 40 mph with a release angle of 28° relative to the ground. How long after Dan starts running should she throw the ball if he catches it in full stride?---------- 38=_____ s

09B-38. A basketball court is 84 ft long, and the basket is 10 ft off the ground. If a person 80 ft from the basket releases the ball 5 ft off the ground at an angle of 28° and makes the basket, what is the time of flight of the ball? ---------- 38=_____ sec

Geometric Modeling

07A-6. What is the circumference of a circle that has a diameter of 7.4 in?---------- 6=_____ in

07D-6. What is the area of a rectangle whose side dimensions are 37.6 and 86.5?---------- 6=_____

07G-6. A goat on a leash grazes a circular area of 814 ft^2. What is the length of the leash?---------- 6=_____ ft

05B-7. A shed has a south wall that is 12 ft. high and a north wall that is 8 ft high. What is the angle of the roof relative to the ground if the walls are 10 ft apart?---------- 7=_____ deg

05D-7. A male African elephant weighs 16,500 lbs. A person on average weighs 140 lbs. Arlington's Ballpark stadium seats 43,521 people. How many elephants would this be if the stadium was designed to accommodate a certain weight? ---------- 7=_____

07D-7. A ream of 500 sheets of paper is 48 mm thick. What is the thickness of a single sheet of paper?--------- 7=_____ μm

08E-7. A yard stick is 36 in long and 1.25 in wide. What is the distance across the diagonal? ---------- 7=_____ in

08F-7. What is the ratio of the light gathering area of a 50 mm diameter monocular lens and the pupil of a human eye, 3.5 mm in diameter? ---------- 7=_____

08G-7. The diameter of a golf ball is 1.68 in, and a beachball is 1.22 ft in diameter. What is the dimensionless ratio of their diameters, a number greater than one? ---------- 7=_____

07I-8. A rectangular park is 450 ft by 820 ft. What is its area? ---------- 8= ft^2

08H-8. An 8.5 in x 11 in sheet of paper is reduced by 35% on a copier. What is the length of the diagonal of the reduced image? ---------- 8= in

05A-17. A tent is 40 ft x 200 ft. If we assume that we required from 10 to 12 sq. ft/person for a BBQ dinner, what is the maximum number we can accommodate? ---------- 17= integer

05D-17. A balloon has a spherical shape with a diameter of 52 ft. What is the volume of gas required to fill this balloon? ---------- 17= yd^3

05G-17. The volume of a rubber band is constant, so it must get smaller in cross section as it is stretched. If the cross section is 2 mm^2 when stretched to a length of 20 cm, at what distance is the cross section 1.5 mm^2? ---------- 17= cm

06D-17. A candle 0.75 inches in diameter and 8 inches long burns completely in 4.8 hours. How long must a 0.5 inch square candle be if it burns completely in 2.7 hours and the burn rates are identical? ---------- 17= in

06F-17. The elevation change of a wheelchair ramp is one inch for every horizontal foot of distance. What small acute angle does this represent? ---------- 17= deg

06G-17. Hole 1 at the Walnut Cove Course is 448 yards long, and the hole cup is 5 inches in diameter. What is the angle of the sector the ball must travel in if the golfer hits a hole in one? ---------- 17= deg

06H-17. Arnold can comfortably read a computer screen character in 8 point font at a distance of 20 inches. There are 72 points in an inch. How tall should a character be for Arnold to read it comfortably on a marquee across Times Square at 900 ft away? ---------- 17= ft

06I-17. What is the area of one side of a credit card if it is 85 mm by 54 mm with a corner radius of 4.4 mm? ---------- 17= mm^2

07I-17. The side dimensions of a cube shrink uniformly from 36 mm to 32 mm. If the starting density was 4 g/cm^3, what is the ending density? Assume the mass is constant during shrinking. ---------- 17= g/cm^3

08C-17. If it takes 22 s to drill a hole directly through a “4x4” piece of wood, how long would it take to drill the hole across the diagonal? A 4x4 is actually 3 5/8 in on a side, and assume constant drill feed rate. ---------- 17= s

07A-18. The Iron Pillar of Delhi is 8.3 m tall. The diameter is 48 centimeters at the foot, tapering to 29 cm at the top. What is its volume? ---------- 18= cm^3

07C-18. Human hairs are 600 microns apart in a square array. If a human head is approximated by a sphere 8

inches in diameter and 35% of the surface is hair, how many hairs are on a human head?---------- 18=_____

07G-18. What fraction of the earth's surface is land area if oceans occupy 1.395×10^8 mi^2?---------- 18=_____ %

07I-18.A cord of wood is 128 ft^3. The wood is cut into 3 ft lengths. How high is a stack of 3 cords of wood if the width of the stack is 5 times the height?--- 18=_____ ft

08D-18. A roll of paper towels is 6.5 inches in diameter with a spool of diameter 1.25 in. What is the ratio of angular velocities of a full roll and almost empty roll, assuming the pull velocity is constant? ---------- 18=_____

08F-18. Texas lies roughly at 30 degrees north latitude. What is the width of the Central Standard Time zone here, assuming that it represents 1/24th of the circumference of the earth at this latitude? ------- 18=_____ mi

09F-18. To get diagonally across a square 5-acre field Fred can walk straight across or follow along two edges. What is the positive difference in these two travel options? ---------- 18=_____ ft

05B-26. A watershed is 150 sq. mi. If all the water drains into a lake that spans 30,000 acres, what is the vertical rise in water level from a 2 inch rain?---- 26=_____ in

05D-26. What is the ratio of the apparent volume of a wad of paper 5 inches in diameter and the sheet of paper before wadding if the sheet was 23in x 25in x 0.0025in?---------- 26=_____

05E-26. A school once collected one million pennies as a fund raiser. A penny is 0.75 inches in diameter and 0.05 inches thick. If the density is 8.9 g/cm^3, how much does one-million pennies weigh?---------- 26=_____ lbs

05G-26. A barbed wire fence has three rows of barbed wire. What length of barbed wire is needed to fence in a 50 acre square plot?---------- 26=_____ mi

06A-26. A ten acre square plot was fenced using 4 rows of barbed wire. The owner calculated the length of barbed wire needed, but he forgot to include that the barbed wire was looped once around the fence posts that were 12 ft apart. Each looping turns a diameter of 2 inches. How much extra fencing is needed? -------- 26=_____ ft

06D-26. A string is cut into three sections with length ratios 2:8:9. What is the measure of the largest interior angle? ---------- 26=_____ rad

06F-26. At what latitude north of the equator is the average length of a time zone such as the Central Time Zone equal to 800 mi? ---------- 26=_____ deg

07G-26. A screw must advance into a workpiece 0.05 in when the screw is rotated 3/8 of a turn. How many threads per inch (tpi) are needed? ---------- 26=_____ tpi

09A-26. The Nile River is 4132 mi long. What fraction of the earth's circumference is this? ---------- 26=_____ %

05B-27. A stack of five identical plates is 8 cm tall and a stack of 9 is 13 cm tall. What would be the height of a stack of four plates if all plates nest within each other? ---------- 27=_____ cm

05E-27. An igloo is shaped like a hemisphere with a base area of the inside of 100 sq. ft, and a wall thickness of 1 ft. What is the volume of ice required to construct this igloo if the entrance removes 8% of the volume? ---------- 27=_____ ft^3

05F-27. A kettledrum is a hemisphere and the drumhead has an area of 7 sq. ft. If the drum is made of copper, which has a density of 8.96 g/cm^3 and weighs 30 pounds, what is the thickness of the copper? -------- 27=_____ in

05I-27. The span of the moveable parts of a 2-section symmetric drawbridge is 100 ft. If the angle of the sections of the bridge in the up position is 20°, what is the distance between the highest parts? -------- 27=_____ ft

06A-27. What is the roaming area of a goat on a 20 ft leash tied to the corner of a shed that is 8 ft by 12 ft? ---------- 27=_____ ft^2

06B-27. A plane leaves Yokum at 2 PM, traveling north at 170 mph. At 2:15 PM, another plane leaves Yokum traveling slightly east of north at 210 mph. If they are 50 miles apart at 3 PM, what is the compass bearing of the second plane? The compass bearing is an angle in degrees measured clockwise from north. ---- 27=_____ deg

07E-27. What is the roaming area of a dog on a 30 ft leash if it is tied to a fence with a 6 ft wide opening 20 ft away? ---------- 27=_____ ft^2

07F-27. A 440-yd track around a football field has two straight 120 yd sections connected by semicircles. The football field playing area is 100 yd long and 160 ft wide. What is the area between the track and the football playing area? ---------- 27=_____ ft^2

08D-27. A sphere is 13 cm in diameter initially. Its volume was reduced by 18%. What is the new radius? --- 27=_____ cm

09H-27. A wheelchair ramp must have one inch of vertical drop for every foot of horizontal run. It must also have a 5 ft long, non-slanting landing every 15 ft of horizontal run. What is the horizontal run for a wheelchair ramp with a 4 ft vertical drop? ---------- 27=_____ ft

09I-27. A tall round building is 150 ft in diameter with a 10 ft wide sidewalk immediately surrounding it. What is the largest distance two people can be apart on the sidewalk if they can see each other? ----- 27=_____ ft

05C-28. A cube, 12 inches on a side, is painted and then sawn into 1728 smaller cubes, 1 inch on a side.

What percent of the cubes have one or more painted sides? ---------- 28=_____ %

06A-28. Three tennis balls are sold in a cylindrical container of nominally equal diameter. What is the volume of the cylinder divided by the volume of one tennis ball? ---------- 28=_____

06C-28. Compass bearing is the angle in degrees measured clockwise from north. If Hank hikes 5 mi at a bearing of 110° and then hikes another 8 mi at 210°, how far is he from where he started? ---------- 28=_____ mi

06E-28. The top of a US flag is attached to the top of a flagpole at an elevation of 10 ft; the bottom of the flag is attached at 8 ft elevation. The ratio of flag length to width is 4:3. What is the closest distance between the flag and the ground when there is no wind? ---------- 28=_____ ft

07A-28. Gold leaf is 4 millionths of an inch thick. What area can be gilt with 1 g of gold leaf if its density is 19.2 g/cm^3? ---------- 28=_____ ft^2

07D-28. A basketball basket is 18 in wide, and the three-point line is 20 ft 6 in from the center of the basket. If the basket is 3 ft above the point of release of the basketball, what shooting angle from the three-point line does this represent if the 9-in diameter ball does not hit the rim as it goes in? ------ 28=_____ deg

07H-28. How far apart are Moscow (37°36′E) and Copenhagen (12°34′E) if both lie at 55°43′ N latitude? Calculate the distance along a line of constant latitude. ---------- 28=_____ km

07I-28. A barbed wire fence encircles an 18 acre square field. The fence is four strands of barbed wire at different heights attached to posts. How much wire is needed? ---------- 28=_____ mi

09B-28. What is the barrel minimum inside diameter of a 10 gauge shotgun? The ‘gauge’ is the number of spherical projectile balls equal to the barrel size, made from a pound of lead. The density of lead is 11.35 g/cm^3. ---------- 28=_____ in

05A-36. Beaumont, Texas and Cairo, Egypt lie on a latitude of 29°53′ and longitudes of 94°1′ West and 31°20′ East, respectively. What is the length of the line of constant latitude between these two cities? ---- 36=_____ mi

05B-36. The aspect ratio of US flag dimensions are 10:19. If a large flag has stripes at the bottom running 30 ft, what is the shortest acceptable flagpole if the flag comes no closer to the ground than 15 ft? ---------- 36=_____ ft

05D-36. A block is placed on a table tied with a string extending 18 inches perpendicular to the table edge. The block is nudged over the table edge causing it to fall. How long after this does the

block come into closest direct approach to the end of the string? ---------- 36=_____ sec

06B-36. Two ships were traveling in a straight line 10 mi apart. The leading ship, traveling at 25 knots, executed a circular maneuver to completely circle to a point 0.25 mi behind the trailing ship which was going 16 knots. If a knot is 1.15 mph, what is the radius of the circle? ---------- 36=_____ mi

06D-36. Four marbles are stacked touching to make a triangular pyramid. What is the highest point on the top marble divided by the marble radius? ---------- 36=_____

07C-36. An equilateral triangle is overlaid by a circle. The center of the circle is a corner of the triangle, and the other two corners lie on the circle circumference. What is the circle circumference divided by the triangle perimeter? ---------- 36=_____

08D-36. What percent of the earth's surface can be seen in an airplane flying at 30,000 ft elevation? Neglect refraction. ---------- 36=_____ %

08G-36. Two boats leave each other, one traveling northeast at 8 knots and the other traveling east at 12 knots. How long does it take them to be 100 mi apart if a knot is 1.15 mph? ---------- 36=_____ hr

09E-36. The volume of water in the world's oceans is 317 million cubic miles which is 97.24% of the total water on the earth. What fraction of the earth's volume is water? ---------- 36=_____ %

09H-36. A 36-in piece of string is used to form a triangle with sides in the ratio 4:5:8. Find the triangle area. ---------- 36=_____ in^2

05A-37. The combs that a honeybee builds to hold their honey are hexagonal. If a sheet of honeycomb is 12 inches x 20 inches, the width of the wax accounts for 10% of the area, and the honeycombs are 3 mm on a side, how many cells are there in the honeycomb? ---------- 37=_____ cells

05B-37. A hoola hoop is 36 inches in mean diameter and 1 inch diameter in cross section. What is the volume of the hoop? ---------- 37=_____ in^3

06A-37. A thin-walled circular cylinder is filled 85% with water, closed up and then tipped over on a table so it would roll if pushed. What is the height of the water level over the tabletop divided by the cylinder diameter? ---------- 37=_____

06B-37. A 2 meter long piece of dental floss is pulled tight 1 meter above the ground. It is then relaxed by moving one end 175 mm towards the other end. Assuming the sagged floss forms a circular arc, how far above the ground is the midpoint of the floss? ---------- 37=_____ cm

07E-37. Two ships travel east at 25 mph, one exactly 15 mi behind the other. They simultaneously change

course, one heading 20° northward, and the other heading southward at the same angle. How far apart are the ships after 2 hr? ---------- 37=_____ mi

07I-37. If a person were approximated to be a right circular cylinder of height h, what would his diameter be? Assume the person's height h is 5 ft 10 in, his weight is 195 lb, and his density is 1.1 g/cm^3. -------- 37=_____ in

08I-37. Two ships are 2 mi apart and traveling at 25 knots. The lead ship executes a turn 25° to port (left) at the same time that the trailing ship executes a 25° turn to starboard (right). How long does it take them to be 100 mi apart? One knot equals 1.15 mph. ---------- 37=_____ hr

09F-37. A pipe has an outside diameter of 1.25 in and an inside diameter of 0.75 in. If Kelly hacksaws the pipe in two, what fraction of the pipe cross sectional area is sawn when the blade breaks through to the inside? ---------- 37=_____ %

05E-38. Consider a cube that can be stretched in one direction while the square cross section decreases in such a way as to keep the volume constant. What is the length to side ratio if the cube final area divided by the original area equals the natural logarithm of pi? ---------- 38=_____

05H-38. The height of Mount Everest is 28,973 ft, and the height of K2, the second highest mountain in the world, is 8,614.27 m. These mountains are 772 miles apart. How far apart are the horizons seen by the two mountains (assuming a spherical earth) on a straight line between them? ---------- 38=_____ mi

06E-38. A 4.5 ft cord is sectioned into three pieces to form a right triangle. If the hypotenuse is 2.1 ft, what is the ratio of the lengths of the other two pieces, a number greater than 1? ---------- 38=_____

07A-38. On a Texas ranch, a pond is 285 ft in diameter and the land slopes at 4° (from horizontal) away from the pond. What is the pond diameter after a 1.5 in rain if 40% of the rain runs into the pond, and the rain gathering area is 3 acres? ---------- 38=_____ ft

07I-38. Three bowling balls are pushed together on the floor and a fourth is stacked on top. If bowling balls are 8.5 inches in diameter, what is the vertical distance from the floor to the top of the fourth bowling ball? ---------- 38=_____ in

08C-38. A large circle is drawn inside a square and tangent to the sides. Four smaller circles are drawn in the corners inside the square but outside the large circle, such that each is tangent to the large circle and also to two edges of the square. What is the diameter ratio of one of the small circles and the large circle, a number less than one? ---------- 38=_____

08G-38. A large amount of dough is rolled out and as many circular cookies as possible are cut from the rolled-out dough. The remaining dough is piled together, rerolled and more circular cookies are similarly cut. What percent of the original amount of dough is left over? ---------- 38=_____%

08I-38. The end of a 15-ft long dog leash slides along a taut 75-ft long clothesline. What is the height of the clothesline if the roaming area is 1800 ft^2? ---------- 38=_____ft

Functions

Features on a Graph

09G-8. What is the slope of the line passing through the points (6,7) and (13,-5)? ---------- 8=_____

06A-16. How far is the point (25,-18) from the origin? ---------- 16=_____

08A-16. What is the distance between the origin and the intersection of the lines y = 8x-7 and y = -x/3+5? ---------- 16=_____

07B-18. What is the length of the line segment of the line y = 4x+7 between x = -5 and x = 7? ---------- 18=_____

07E-26. What is the distance from the point (37, -41) to the intersection of the lines y = 7x-3 and y = -4x+2? ---------- 26=_____

06C-27. What is the distance from the intersection of the lines y = 7x+9 and y=-x/4+13 to the origin? ------- 27=_____

06D-27. What is the distance between the intersections of the circle $x^2+(y-5)^2 = 2500$ the line y = 3x-7? ---------- 27=_____

07B-28. What is the shortest distance from the line y = -2x+7 to the circle $x^2+y^2 = 6$? ---------- 28=_____

08B-28. A line 150 units long spans from the origin to a point (a,b) on the parabola $y = 4x^2$. What is (positive) a? ---------- 28=_____

09B-36. What is the length of the line segment on y = 4x+3 intersecting the inside of the circle $x^2 + y^2 = 20$? ---------- 36=_____

09F-36. What is the y value of the intersection of the line y = 7x-10 and y = -5x+20? ---------- 36=_____

08A-37. What is the length of the line segment created by the intersections of the line y = 4x-7 and the parabola $y = 4x^2-25$? ---------- 37=_____

08H-38. What is the distance between points of intersection of the parabola $y = 6x^2+2$ and the circle $x^2+(y-2)^2 = 29$? ---------- 38=_____

09A-38. If $x^2 + y^2 = 152$ and $x^2 - y^2 = -49$, what is the smallest value of $(x+y)^2$? ---------- 38=_____

Equation Writing

08I-8. In 2006, the US birth rate was 14.16 people per 1000 population; the death rate for the period was 8.26 per 1000. If the population at the start of 2006 was 300 million people, what was the annual increase in population for 2006? ---------- 8=_____ people

06F-16. A temperature expressed in Fahrenheit is 0.9 the temperature in Centigrade. What is the Fahrenheit temperature? ---------- 16=_____ °F

09B-16. A 28-in diameter tire has a 50,000 mile warranty. How many times does it rotate in its expected lifetime? ---------- 16=_____

09G-16. A laser was set to output 50 watts, but the measured output was only 42 watts. What is the laser setting if it is desired to actually produce 30 watts? ---------- 16=_____ watts

05E-17. What is the sum of the series $5 + 5^2 + 5^3 \ldots + 5^{10}$? ---------- 17=_____

05I-17. The area that can be viewed from a height h increases in proportion to the height if the terrain is perfectly spherical but varies as the 0.8 power with a certain type of rough terrain. A fire observational tower that is 80 ft high in rough terrain can view an area of 500 square miles. How high should the tower be to view 1000 square miles? ---- 17=_____ ft

08D-17. An ipod weighs 2 oz and costs $249. What is the ratio of the cost per unit weight for an ipod and gold given that the latter costs $671.05 for 31.1 g? -- 17=_____

05C-18. The GPA of a student is the total number of grade points divided by the total number of hours. If a student has a 3.26 GPA on 90 hours and makes a 3.69 GPA on 13 hours the next semester, what is the overall GPA after that semester's grades are considered? ---------- 18=_____

05I-18. To protect garden plants from the heat of the sun, a flat shelter of screen wire is placed over the plants. This screen absorbs 70% of the sun's rays and passes 30%. Over the most tender plants an additional layer of screen is added. What percentage of the sun's heat reaches these doubly shielded plants? ---------- 18=_____ %

08B-18. The Toyota Prius hybrid automobile costs $23,070 and gets 50 mi/gal. It uses both gasoline and a battery that is charged when braking. What is the break-even driving distance for a Prius compared to a $18,000 car that gets 30 mi/gal if gasoline costs $3.03/gal? ---------- 18=_____ mi

06G-26. Ten tablespoons of dye are added to a gallon of water to make dyestock. How much dye is needed to make twenty 55-gallon drums of diestock? ---------- 26=_____ gal

07I-26. Two gears mesh and counter-rotate. One has 35 teeth and the other has 8 teeth. What is the ratio of their rotational velocities, a number less than one? ---------- 26=_____

08A-26. If a stick 1 meter long casts a 9.4 in shadow, what is the length of the shadow cast by a 273 cm long stick? ---------- 26=_____ mm

09F-26. Teletubbies was produced by BBC and ran four years in the late 1990s. If each of the four Teletubbies ate one piece of Tubby Toast per episode, there were 40 episodes per year and there were 20 slices in a loaf, how many loaves of Tubby Toast were consumed? ---------- 26=_____ loaves

05D-27. The height of a clothesline follows the equation $h(x) = 3 + 0.005(x - 20)^2$ ft. What is the minimum height of the line above the ground? ---------- 27=_____ ft

07C-27. How many paper clips can be made from a 100-lb spool of 0.03 in diameter steel wire? The density of steel is 7.87 g/cm^3, and an unfolded paper clip is 3.75 in long. ---------- 27=_____

08G-27. The Rankine absolute temperature scale is approximately the Fahrenheit temperature plus 459.67. What temperature in Rankine equals the negative of the temperature in Centigrade? ---------- 27=_____ °R

08I-27. A tire manufacturer wants to offer a warranty on their tires of 50,000 mi or x years. The desire is for the life in years to associate with 50,000 mi travel. If the average car drives 1.5 hr daily at 30 mph, what is x? ---------- 27=_____ yr

06F-28. Barbara Jean makes $6/hr working at the Dairy Queen. In a 5-hr shift, how many regular "Blizzards" must she sell on average to earn enough for the owners to break even? A Blizzard costs $1.89 and the profit is 45% of the cost. ---------- 28=_____

07F-28. On Day 1, you get an entire pie On Day 2, you get one third of an entire pie. On Day 3, you get a third of a third of an entire pie. If this continues indefinitely, how many pies do you receive altogether? ---------- 28=_____

08A-28. Sandy made an 8-cup pot of coffee. After taking one cup out, she found it was too strong and topped off the pot with hot water. She took a second cup and it was too strong, so she repeated the process. The third cup was still too strong so she refilled the pot with hot water a third time. What is the final strength of the coffee divided by the original strength? ---------- 28=_____

06H-36. One gallon of salt water solution is 12% salt. Water is added to make a 3.7% solution. How much 3.7% solution is there? ---------- 36=_____ gal

08A-36. A towel weighs 3.5 lbs soaking wet but only 1.1 lbs when 80% of the water is wrung out. What does it weigh after it dries completely? ---------- 36=_____ lbs

05G-37. A juggler juggles two balls with one hand. Both balls are in the air 20% of the time with one ball in the air 100% of the time. If he throws a ball every second, how high is the ball thrown relative to the point of release? ---------- 37=_____ ft

05H-37. A piece of lava cools according to the formula $T(t) = 1000e^{-0.006t} + 100$ where 100° is the final temperature, 1100° is the initial temperature, and *t* is the time in months measured from the time of the eruption. How many years before the temperature of the rocks is 200°? ---------- 37=_____ yr

05I-37. The intensity of light varies as the inverse of the square of the distance from the source. How far from a 60 watt bulb is there adequate light for reading if the distance from a 75-watt bulb is 12 ft? Assume that light output is proportional to wattage. ---------- 37=_____ ft

07A-37. At what depth below sea level (a positive number) is the fresh water pressure equal to 100 psi? Neglect air pressure contributions. ---------- 37=_____ ft

08B-37. Five oz of dye is needed to make one gallon of dye stock. How much dye is needed to convert 15 gallons of water to dye stock? ---------- 37=_____ cups

07F-38.A 4 ft by 8 ft sheet of 0.75 in thick wood was 40% moisture by weight before drying and 5.3% moisture by weight after drying. What was its original weight if it weighed 95 lbs after drying? ---------- 38=_____ lbs

07G-38. A screen transmits 35% of incident light and reflects the rest. What fraction of incident light passes through two screens stacked together? ---------- 38=_____ %

08D-38. How much 10% salt solution must be added to 2 gallons of a 25% salt solution to dilute it to 21%? ----- 38=_____ qt

Compound Interest, Exponential Growth and Decay

08C-16.How many years must $1000 be invested at 3.5% annual interest to yield $1500 (principal plus $500 interest)? ---------- 16=_____ yr

09B-17. Sweet Adelines, a female barbershop singing organization, grew from 1500 members in 1949 to 30,000 in 2007. What was the average annual growth in membership? ---------- 17=_____ %

05D-18. In 1955, I bought regular gas in Waco for 19.9 cents per gallon. In 2004, I am paying 179.9 cents per gallon. What inflation rate does that represent? ------ 18=_____ %

06H-26. If bacteria count doubles every 10 hours, and there are initially 100,000 bacteria, how many bacteria are there in 4 days? ---------- 26=_____

08C-26. The half life of radioactive uranium(230) is 20.8 days, the time required for half to disappear

through conversion to another isotope or element. What percent of an amount of this material remains after 15 weeks? ---------- 26=_____ %

09E-26. Gene invests $100 at 4% annual interest. How long will it take to double his money? ---------- 26=_____ yr

08F-28. AOL reported 24 million US subscribers in 2001, a doubling over the previous 2.5 years. Based on this exponential growth rate, how many subscribers are there in 2008, 7 years later? ---------- 28=_____

08G-28. An insect pest population doubles every 18 days. If an insecticide kills 90% of the insects, how often should it be applied to keep in insect population in check? ---------- 28=_____ days

06A-36. At what annual interest rate must Fran invest $5000 to make a total cumulative profit of $500 in 4 years if interest is compounded monthly? ---------- 36=_____ %

07E-36. Fred invests $10,000 for 2 years. He would make $200 more if the interest was compounded monthly instead of annually. What is the annual interest rate? ---------- 36=_____ %

09A-36. The half life of Uranium 230 is 20.8 days, the time needed for 50% to decay. How long would it take for 20% of Uranium 230 to decay? ---------- 36=_____ days

06C-37. An insect population, if unchecked, would triple every 15 days. What fraction of the original population must be annihilated every 7 days to keep the population in check (i.e., to keep it from growing)? ---------- 37=_____ %

07D-38. Rich deposits six, consecutive monthly payments of $100 each at 3% annual interest compounded monthly. How long after the last payment will he have a total of $1000? ---------- 38=_____ yr

Linear Interpolation and Extrapolation

05A-18. A flashlight battery has a voltage of 1.57 volts when new but the voltage decreases to 1.45 volts as the battery is fully discharged. What is the voltage when the battery is 78% discharged, assuming a linear relation? ---------- 18=_____ volts

06E-27. Worldwide, there were 3955 RP machines at the start of 2003. 803 new machines were made that year. Assuming the number of new machines is proportional to the total number of machines at the start of the year, how many new machines will be made in 2007? ----- 27=_____

Percent Problems

05C-7. What is the percent difference in time required to travel 20 miles at 30 mph and to travel 30 miles at 20 mph? ---------- 7=_____ %

09H-7. What is the percent difference in the number of letters in a state with the longest name, Massachusetts, and the number of letters in a state with the shortest name, Iowa? ---------- 7=_____ %

05E-16. What is the percent difference between π^{π} and π times π? ---------- 16=_____ %

07D-16. In 'Seasons of Love' from the musical *Rent*, there are 525,600 minutes in a year. What is the percent error in this number compared to an average year that accounts for leap years? ---------- 16=_____ %

07I-16. What is the percent difference between the mass of a Honda Civic CR-X automobile (1977 lbs) and that of an African bull elephant (5500 kg)? ---------- 16=_____ %

08B-16. What is the percent difference in the Texian estimate of 1500 Mexican casualties in the Battle of the Alamo and the modern historical estimate of 200? --- 16=_____ %

09E-16. A plane flies to a destination in 38 minutes but it takes a car 3.4 hr to get there. What is the percent difference in the average traveling speed of a car and a plane? ---------- 16=_____ %

09I-16. What is the percent difference in the number of words and letters in this sentence? ---------- 16=_____ %

07B-17. What is the percent difference between a walking rate of a 10 minute mile and 10 mph? ---------- 17=_____ %

07C-17. What is the percent difference in the weight of an Asian (4000 kg) and an African (4500 kg) elephant? ---------- 17=_____ %

07E-17. A Red Bull drink has 80 mg caffeine, and a cup of coffee has 110 mg. What is the percent difference in the amount of caffeine? ---------- 17=_____ %

09F-17. A tuba costs $1000 and weighs 24 lbs. A piccolo costs $350 and weighs 13 ozs. What is the percent difference in the cost per pound? ---------- 17=_____ %

08A-18. What is the percent difference between the area of a legal-sized sheet of paper (8.5 in by 13 in) and a letter-sized sheet (8.5 in by 11 in)? ---------- 18=_____ %

08C-18. George thought he could wash the dishes in 35 min, but it actually took him 43 min. What is the percent error in his estimate? ---------- 18=_____ %

08H-18. A baseball is 9 inches in circumference and weighs 5 oz. A bowling ball is 27 inches in circumference and weighs 16 lbs. What is the percent difference in density of a baseball and bowling ball? -- 18=_____ %

08I-18. The Old Testament has 592,439 words and 23,214 verses, while the New Testament has 181,253 words and 7956 verses. What is the percent difference in the average number of words per verse in the Old and New Testaments? ---------- 18=_____ %

09A-18. What is the percent difference in the number of potatoes produced in 2006 in the United States (20 million) and in Russia (39 million)? ---------- 18=_____ %

05A-26. Lance Armstrong won the tour de France in 2001, a 2,146-mile race by bicycling for a total of

86 hours 17 minutes 28 seconds. He beat Jan Ullrich of Germany by 6 minutes 44 seconds. What is the percent difference between Lance's average speed and Jan's? ---------- 26=_____%

05H-26. Sue sleeps 8 hours each night and Sam sleeps 6 hours. What is the percent difference in their sleep-to-awake ratios? ---------- 26=_____%

07H-26. What is the percent error in approximating cos80° by linearly interpolating between cos70° and cos85°? ---------- 26=_____%

08D-26. John arrived at the airport on time to fly from New York to Austin. His time in transit was supposed to be 8 hr 48 min, but after he arrived at the New York airport, his departure was delayed 2 hr 20 min. What is the percent difference between his original and actual transit time if transit time is calculated from the time he arrived at the New York airport until the time he arrived in Austin? ---------- 26=_____%

08E-26. What is the percent error in 5cos(37°) by linearly interpolating between 5cos(30°) and 5cos(42°)? ---------- 26=_____%

08F-26. Josh completes a job in 4 hr, but Jane can do it in 3.3 hr. What is the percent difference in the total time to complete the job if Josh does it alone, and if Jane joins Josh after 2 hr? ---------- 26=_____%

07B-27. What is the percent difference in distance to the horizon for a 5 ft tall person standing on the ground and the same person standing on a 50-ft tall platform? ---------- 27=_____%

08B-27. The height and diameter of a cone are equal in length. What is the percent difference in total and lateral surface areas? ---------- 27=_____%

08E-27. Between 1980 and 2007, the birth rate in Greece decreased from 15.4 per thousand to 9.6 per thousand. What is the annual percent change in birth rate? ---------- 27=_____%

08F-27. A pane of glass is 24 in x 36 in x 0.125 in thick. It is shattered into square pieces 0.25 in on a side. What is the percent increase in total surface area of glass? ---------- 27=_____%

05F-28. A long life 100-watt bulb lasts 1500 hours, puts out 1530 Lumens of light, and costs $3.29 for four. An ordinary 100-watt bulb lasts 750 hours, puts out 1710 Lumens of light, and costs $2.88 for four. What is the percent difference in single-bulb cost on a Lumen-hour basis? ---------- 28=_____%

05H-36. A fresh "1.5" volt battery is 1.57 volts. When the voltage drops to 1.45 volts the battery is exhausted. What is the percent difference between the percent error in these voltages, considering the 1.5 as "correct"? ---------- 36=_____%

06I-36. A plane flew at 37,000 ft and 590 mph from over Dallas to over Oklahoma City. A car drove between the same locations. What is the percent difference in their travel distances? ---------- 36=_____%

09I-36. A dog is tied to a 16 ft square shed with a 25 ft long leash. What is percent difference in the dog's roaming area if it is tied in the middle of one side or on a corner? ---------- 36=_____%

06F-37. Shakespeare used 14,376 words only once in a sample of his complete works. He used 364 words ten times. The number of words W used n times is $W = An^b$ where A and b are constants and W is rounded to the nearest integer. What is the percent error in the estimate for words used 6 times if there were actually 837 words? ---------- 37=_____%

Logarithmic Solutions (Large and Small Numbers)

06H-28. Calculate $457000^{(13900)}$. ---------- 28=_____

06I-28. Calculate $0.881^{(-86800)}$. ---------- 28=_____

08I-28. What is $45{,}678^{98{,}765}$? ---------- 28=_____

07H-36. What is $986{,}164^{855{,}230}$? ---------- 36=_____

08C-36. Calculate $90{,}745^{101{,}730}$. ---------- 36=_____

08F-36. What is $53{,}197^{-93{,}461}$? ---------- 36=_____

07D-37. What is $1{,}309{,}284^{-124{,}321}$? ---------- 37=_____

09G-37. Calculate 0.0942^{-48285}. ---------- 37=_____

09I-37. Calculate 72057^{5912}. ---------- 37=_____

06C-38. What is $(0.0035)^{-10{,}753}/(9654)^{25{,}345}$? ---------- 38=_____

06D-38. What is $(50{,}369)^{50{,}369}$? ---------- 38=_____

06H-38. What is $(0.000063)^{95{,}433}$? ---------- 38=_____

07B-38. What is $(615^{224})^{1320}$? ---------- 38=_____

Solver Problems (Transcendental Equations)

05A-48. (deg) What is d if $\sin(d+5) = d$? ---------- 48=_____

05B-48. Find t if $5t^5+120t = 200+60t^3$. ---------- 48=_____

05C-48. (rad) For what value of y between 0 and 1 does $5\cos(3y)=6\sin(3y^2)$? ---------- 48=_____

05D-48. (rad) For what value of m between 0 and pi does $\sqrt{\sin(m)} = (m + 2)\cos(m)$? ---------- 48=_____

05E-48. For what nonzero value of g does $\sqrt{\exp(-g / 2)}$ $= 6g^2+1$? ---------- 48=_____

05F-48. What is w if $(2w-3)^{3.5} = 3.5w^{w/100}$? ---------- 48=_____

05G-48. Find k if $\log(k)+\sqrt{k} = 0$. ---------- 48=_____

05H-48. What is r if $3[\ln(r)]^3 = 3r$ and $r>10$? ---------- 48=_____

05I-48. (deg) What is a if $\cos(a/100) = a^3+0.4$? ------- 48=_____

06A-48. What is x (rad) if $\sin(0.3x^2-2) = \log(5x)$? --- 48=_____

06B-48. For what value of z does $(4z^3-3z^2+20z+467)^{1/2}$ $= 1/z$? ---------- 48=_____

06C-48. What is t (deg) if $(8t)\sin(t^2/600) = 6-11t$? --- 48=_____

06D-48. For what value of y greater than 1 does $6y^6 - 3(y-3)^3 = y+50$? ---------- 48=_____

06E-48. What is s if $\log(s) - \ln(s) = s$? ---------- 48=_____

06F-48. What is the distance between the intersections of the curves $y = 5x^4 +3x^3$ and $y = 20 - x^2/10$? ---------- 48=_____

06G-48. What is m (deg) when $\cos(m) = e - m - 1/2$? ---- 48=_____

06H-48. For what negative value of d does $28 - d^2 = (3-7d^2)^2$? ---------- 48=_____

06I-48. What is g if $24\log(6g)-2 = 500-2g$? ---------- 48=_____

07A-48. For what positive value of k does $(k-4)(3k+2)+\ln(6k) = 0$? ---------- 48=_____

07B-48. For what value of y does $y\log(y)+y^3 = 7.8-4y$? ---------- 48=_____

07C-48. For what value of d does $\log(d^2-3)+\sqrt{d} = 20-9.6d$? ---------- 48=_____

07D-48. What is j (rad) if $0<j<0.5$ and $\cos(j+2)/\sin(5j-6) = 3\cos(j)+40j-10$? ---------- 48=_____

07E-48. Solve real m for $m^m = (5-m)^{(5-m)}$. ---------- 48=_____

07F-48. Solve for r (rad) if $3r/\cos(r^3) +7(r+2) = 100r-6$ if r is greater than 0 and less than 1. --------- 48=_____

07G-48. Find the negative value of z (rad) for which $z\cos(\sin(5z)) = 5/(z-2.5)$. ---------- 48=_____

07H-48. Solve for positive g if $5g^{-5} -2g^{-2} +g = g^2+5$. ---------- 48=_____

07I-48. What is x if $0.5<x<1$ and $0.3x^{3.1} -7(x-.5)^{2.2} = 3x-2$? ---------- 48=_____

08A-48. (rad) What is b if $\sin(b)/b = 2b+0.1$? --------- 48=_____

08B-48. (deg) For what smallest positive value of x does $9x\tan(x-32) = (2+x)\log x$? ---------- 48=_____

08C-48. For what positive value of y does $\log(y+7) = y^2-3\ln(2^y)$? ---------- 48=_____

08D-48. Solve for $u>1$ if $8u^{-1} = 5u^{-2}+\ln u$. ---------- 48=_____

08E-48. (rad) What is the negative value of t if $\cos(t) = 3t^2+5/t$? ---------- 48=_____

08F-48. What is p if $p>5$ and $3(p-7)^6+3^p = (400-p)+7(p+10)$? ---------- 48=_____

08G-48. (rad) Solve for negative k if $(9-k)^{-5}\cos(k) = 6-k^2$. ---------- 48=_____

08H-48. What is the positive value of x for $x^{2x} = 10-3x^2$? ---------- 48=_____

08I-48. Solve for (real) q if $7.5q^{5.8}-3 = 5q^2-2q$. ----- 48=_____

09A-48. (rad) Solve for negative u if $\text{Log}(u + 5) = 6\cos\left(\frac{u}{2}\right)$ if $-4<u<0$. ---------- 48=_____

09B-48. Solve for the negative value of w if $5w^2 = w^6 + \frac{3}{w}$. ---------- 48=_____

09E-48. (rad) What is the value of x between 0 and 2 if $\sin(x + 7) = x^3\cos(5 - 2x)$? ---------- 48=_____

09F-48. What is z if $z + \sqrt[5]{z - 17} = \pi^3$? ---------- 48=_____

09G-48. (rad) Solve for q if $q^2 + \cos(5q + 3) = 17\sqrt{q}$. ---- 48=_____

09H-48. Solve for y less than -1 if $\frac{1}{6y + 3} = \frac{8y^5 - 6y^3 + 2}{15y^2}$. ---------- 48=_____

09I-48. (rad) Solve for d if $\frac{\sin d}{6d} = 4 + d$. ---------- 48=_____

Scaling Problems

05H-17. A size 10 shoe uses 2.1 ft^2 of leather. How much leather does a size 11-1/2 shoe require, assuming all length dimensions scale according to size? ---------- 17=_____ ft^2

05G-27. The members of the violin family are the violin, viola, cello, and double bass. Linear dimensions are scaled roughly in the ratio 1:1.44:3:6. Assuming all dimensions are scaled according to these ratios, what is the ratio of the weight of a violin and a double bass? ---------- 27=_____

05H-27. The members of the violin family are the violin, viola, cello, and double bass. Linear dimensions are scaled roughly in the ratio 1:1.44:3:6. Assuming all dimensions are scaled according to these ratios, what is the ratio of the area of the back plate of a viola and a cello? --------- 27=_____

09E-37. The Colossus of Rhodes, one of the seven wonders of the ancient world, stood 100 ft. It was clad with bronze plate averaging 0.5 in thickness. The surface area of a man 6 ft tall is 1.9 m^2. Based on this, estimate the weight of bronze used in the Colossus. The density of bronze is 8.75 g/cm^3. ------- 37=_____ lb

05A-46. A 5-in long bag holds 88 candies. How many candies are in a 14-in long sack of identical shape? --- 46= _____

05B-46. A scaled copy of the Eiffel Tower is 7.5 in tall. If the actual Eiffel Tower is 300 meters tall and has a base area of 15,620 m^2, what is the base area of the scaled copy? ---------- 46= _____ in^2

05C-46. If the volume of a hemispherical solid is to be increased by 45%, by what percentage must the diameter increase? ---------- 46= _____ %

05D-46. Shirt size is the nominal neck circumference in inches. If a 80-lb person wears a size 12 shirt, what is the weight of a person who wears a size 16 shirt? ---------- 46= _____ lbs

05E-46. If a 12-ft tall tree has a trunk circumference of 9.5 in, what is the height of a tree with a 3.8 ft circumference? ---------- 46= _____ ft

05F-46. If a 2-in diameter cookie has a volume/base area ratio of 0.5 inch, what is the volume/base area ratio for a 5-in diameter cookie of identical shape? --- 46= _____ in

05G-46. Mitch ices a 8-in chocolate cake in 8 minutes. How long will it take him to ice a 12-in cake? ---------- 46= _____ min

05H-46. Mary paints the exterior of a 10-ft tall, 200 ft^2 detached garage in 2 hrs. How long does it take her to paint the exterior of a 12-ft tall, 1800 ft^2 house of similar proportions? ---------- 46= _____ hr

05I-28. The volumetric rate of evaporation is proportional to the exposed surface area. If a pan of water that is square and 11 inches on a side evaporates 1 mm of water in 2 hours, how long would it take to evaporate 0.1 inches of water out of a round 11-inch diameter cake pan? ---------- 28= _____ hr

05I-46. Josh can paint a dozen 2.5-in long Easter eggs in 45 minutes. How long would it take to paint four 6-in diameter ostrich eggs? ---------- 46= _____ hr

06A-46. A company makes all their saucepans using 0.03 in thick sheet metal. If an empty 2 qt saucepan weighs 2.7 lb, how much does a 4 qt saucepan filled with water weigh? ---------- 46= _____ lb

06B-46. An architect's model house has 16.5 in^2 of floor space and weighs 3 lb. If scaling principles apply, how much does a 3000 ft^2 house weigh? ---------- 46= _____ lb

06C-46. If it takes 10 blows to fill a 6 in diameter balloon, what is the diameter of a balloon that requires 73 blows to fill? ---------- 46= _____ in

06D-46. If a 5-ft long yard sign can be completely painted in 7 min, how long would it take to paint a 75-ft long billboard of equivalent shape using the same brush? ---------- 46= _____ hr

06E-46. A recipe calls for 3 cups flour and makes 4 dozen 3-in diameter cookies. How much flour is needed to make 7 dozen 2.5-in diameter cookies if all cookies have the same shape? ---------- 46= cups

06F-46. A map of New Mexico is scaled at 1 in = 15 mi. If the map area of the state is 538 in^2, what is the actual area of New Mexico? ---------- 46= mi^2

06G-46. Ants add dirt to a mound at a constant rate. If the mound is 5-in tall in 8 hr, how much longer is needed to make the mound 10-in tall? ---------- 46= hr

06H-46. A 55-gallon barrel is 45 in tall. What minimum number of 12-in tall buckets of similar shape to the barrel are needed if the contents of 3 barrels are transferred to the buckets? ---------- 46= integer

06I-46. Barbells in a set have the same shape and are the same metal. What is the ratio of diameters of the 10 lb and 25 kg barbells, a number less than 1? ------- 46=

07A-46. If it is 1400 miles from Dallas to New York, what is the distance between these cities on a 12-inch diameter globe? ---------- 46= in

07B-46. Picture frames have the same height-to-width ratio and are made by cutting shaped moulding at a 45° angle. If a small 22 in^2 frame requires 18.5 in of moulding, how much moulding is needed for a 259 in^2 frame? ---------- 46= in

07C-46. A set of cook pots has the same shape. If a 1-quart pot is 5 inches tall, how tall is the 4-quart pot? ---------- 46= in

07D-46. If 0.4 “yards” of cloth are needed to make a woman’s purse, how much cloth is needed to make a child’s purse? The woman’s purse holds 2.5 times as much as the child’s purse, and cloth is measured off a 54-in wide spool by its length in yards. ---------- 46= yds

07E-46. Kacie peels 50 3-in apples in 25 min. How long would it take her to peel 25 5-in apples? -------- 46= min

07F-46. If the surface area of a balloon is 18 in^2 after 12 blows into it, what is the surface area after an additional 20 blows? ---------- 46= in^2

07G-16. A cake feeds 24 people and the recipe calls for 2 1/4 cups flour. How much flour is needed if 504 people are fed? ---------- 16= cups

07G-46. Sneakles and snarks have the same shape. If the volume of a 5 tweeny tall snark is 150 queezies, and the volume of a sneakle is 3820 queezies, how tall is a sneakle? ---------- 46= tweenies

07H-46. A creole recipe calls for 2 cups onion and feeds 8 people. How much onion is needed to feed 95 people if each serving was cut down to 75% of the recipe amount? ---------- 46= cups

07I-46. A person 5 ft 8 in tall occupies a volume of 2.67 ft^3. What is the volume of the person's statue if the statue is 98 ft tall? ---------- 46=_____ ft^3

08A-46. A recipe calls for the meat of 12 large lemons. If a large lemon is 4.3 in long with a 0.25 in thick rind, how many 3 in long medium lemons are needed to substitute? The rind on a medium lemon is also 0.25 in. ---------- 46=_____integer

08B-46. Russian Matryoshka nesting dolls have the same shape and fit inside each other. If the largest of a set of 6 dolls weighs 1.5 lbs, and the height of each doll is 20% reduced, what is the weight of the set? ---------- 46=_____lbs

08C-46. A 4-in tall limestone model of the Rock of Gibraltar weighs 1.9 lbs. What is the weight of the Rock of Gibraltar if it is limestone and stands 1396 ft? ---------- 46=_____lbs

08D-46. If Quincy can peel 350 3-in long potatoes in 5 hr, how long will it take him to peel 500 4-in long potatoes? ---------- 46=_____hr

08F-46. The old city wall of York, England forms a square 3 miles in perimeter. If a 4 meter by 4 meter scaled model of the old city were constructed, how tall on the model would a 10 meter tall building be? -- 46=_____in

08H-46. Light intensity varies as the inverse square of distance from the source. If 50 watt bulbs are strung on a line 15 ft apart, at what distance should 100 watt bulbs be strung if the minimum light intensity along the line remains the same? ---------- 46=_____ft

09A-46. How many 36-in waist jeans have equivalent fabric to 100 30-in waist jeans? ---------- 46=_____

09B-46. A 2-layer cake is 9 inches across, and 4 cups of flour were used. How far across is a 3-layer cake made using 7 cups of flour if the layers are geometrically similar? ---------- 46=_____in

09F-46. A bucket is filled with marbles of diameter D. Each marble's cost is proportional to the square of its volume. If a bucket of 0.5 in diameter marbles costs $25, what is the marble diameter for which the bucket cost is $50? ---------- 46=_____in

09H-46. If one adds 22.5 to a woman's shoe size, the sum is proportional to the inside length of the shoe. If a woman who is 5 ft 2 in tall wears a Size 7, how tall is a person who wears a Size 9? ---------- 46=_____ft

09I-46. The time required for a casting to solidify is proportional to the square of the ratio of the casting volume and its surface area. If a 3-in long casting solidifies in 3.8 hr, how long is a casting that solidifies in 13 hr? ---------- 46=_____in

Best Fit Lines

05A-47. We have the following data for the elevation and average January temperature for Wurzburg, Nurnberg, Munich, and Zugspitze, respectively: (587 ft, 32°), (1050 ft, 31°), (1736 ft, 28°), and (9721 ft, 12°). Based on these data, what is the rate at which the temperature decreases with increasing altitude in °/ft, a positive number? ---------- 47= _____ °/ft

05B-47. Jim tosses a ball, trying to throw it 15 ft first and then in subsequent throws to increase the distance by 5-ft increments up to 40 ft. His actual distances were 14 ft, 18 ft, 27 ft, 32 ft, 35 ft and 41 ft. What is the correlation coefficient for these data? ---------- 47= _____

05C-47. Values of the acceleration due to gravity (cm/s^2) and escape velocity (km/s) for four of Jupiter's moons are (7.28,0.112), (5.61,0.087), (1.67,0.025) and (0.73,0.0117). What is the escape velocity of the moon Pan whose gravity is 1.00 cm/s^2? --- 47= _____ km/s

05D-47. The acceleration due to gravity varies with distance from the earth's surface. Values are (0 km, 9.8 m/s^2), (40 km, 9.7 m/s^2), (80 km, 9.57 m/s^2), (120 km, 9.45 m/s^2), (160 km, 9.32 m/s^2) and (200 km, 9.2 m/s^2). What is the best-fit estimate of the elevation at which the gravitational acceleration is 9.5 m/s^2? ---- 47= _____ km

05E-47. The electrical resistivity of tungsten at 100 degree increments between 1100K and 1500K are 27.9, 31.1, 34.0, 37.3, and 40.3 μohm-cm. What is the percent error in the best-fit estimate of the resistivity at 1800K and the exact value, 50.05 μohm-cm? ---------- 47= _____ %

05F-47. A paper cutter has a load measuring device. When 20 sheets are sheared, the load is 16 lbs. Other data are (50 sheets, 45 lbs), (100 sheets, 74 lbs), (130 sheets, 100 lbs), (190 sheets, 162 lbs), (230 sheets, 175 lbs), (400 sheets, 300 lbs). What is the best-fit estimate of the number of sheets sheared using 220 lbs? ---------- 47= _____ sheets

05G-47. A room is heated on a cold day. The temperature is a function of heating time. Measured values are (0 min, 38°F), (10 min, 43°F), (20 min, 58°F) and (30 min, 72°F). What is the average heating rate? ---------- 47= _____ °F/min

05H-47. A company sells partially filled one-gallon containers of water. The cost varies with the amount of water: (8-oz, $0.55), (12-oz, $0.70), (24-oz, $1.08), (48-oz, $1.80), (128-oz, $4.50). What is the best-fit estimate of the container cost? ---------- 47= $ _____

05I-47. The height of an originally 2-ft tall stalk of bamboo was measured daily. Values were 2.9 ft,

4.2 ft, 4.7 ft, 5.9 ft and 7.4 ft. What is the average daily growth rate? ---------- 47=_____ in/day

07A-47. Amanda tried to select books in a library that were 50, 100, 150,… pages long. Her actual selections were 82 pages, 92 pages, 121 pages, 165 pages, 208 pages and 261 pages. What is the best estimate page size for Amanda's attempt to select a 400 page book? ---------- 47=_____ pages

07B-47. Metal is cast into molds to make ingots in 100 lb increments starting at 200 lbs. What is the correlation coefficient if the actual weight of a group of castings was 210 lbs, 294 lbs, 420 lbs, 540 lbs, 591 lbs and 715 lbs? ---------- 47=_____

07C-47. A material's strength is inversely proportional to the square root of grain size. If grain size-strength measurements are (5 μm, 375 MPa), (25 μm, 195 MPa), (60 μm, 150 MPa), (95 μm, 78 MPa) and (350 μm, 40 MPa),what is the strength of a material with no grains (i.e., grain size becomes infinitely large)? ---------- 47=_____ MPa

07D-47. What is the slope of the best-fit line through the data (8,-6), (-6,3), (-4,-1), (-2,-9) and (0,-15)? ---------- 47=_____

07E-47. A plant's height was measured to be 1 in after having been planted for 2 weeks. It was then measured in 3 day intervals: 1.4 in, 1.9 in, 2.5 in, 3.3 in, 3.8 in. Estimate the plant height 5 weeks after planting. ---------- 47=_____ in

07F-47. Josey attempted to throw a ball at 5 ft increments. Her actual distances were measured to be 4.9 ft, 9.1 ft, 17 ft, 20.5 ft, 26 ft and 29.2 ft. What is the best estimate distance for an attempted throw of 45 ft? ---------- 47=_____ ft

07G-47. Megan's scores on a video game improve as she plays. The first time, she scored 8536. The second through fifth game scores were 9218, 9837, 10,591 and 11,322, respectively. On which game will her score be expected to break 15,000? ---------- 47=_____ integer

07H-47. Calculate the correlation coefficient for the data set (7,14), (8,16), (9,20), (10,24) and (11,30). ---------- 47=_____

07I-47. A 150 cm tall test tube was filled with water to measure evaporation. After one day, the water height was 147 cm. On consecutive days, the level fell to 145 cm, 140 cm, 138 cm, 135 cm and 131 cm. How long after filling the test tube will it take to evaporate the water completely? ---------- 47=_____ days

08A-47. A candle is made by dipping a starter in molten wax multiple times. What is the best-fit estimate for the weight of the starter if these measurements were made: (10 dips, 20 g), (20 dips, 33 g), (30 dips, 41 g), (40 dips, 50 g), (50 dips, 55 g)? ---------- 47=_____ g

08B-47. What is the correlation coefficient for the data: (1,57), (2,100), (3,141), (4,258), (5,410)? ---- 47=_____

08C-47. A patient starts to take an antibiotic. After the first day, the germs in the blood count totaled 3052. On succeeding days, the germ count was 2400, 2150, 1500 and 1300. Based on a linear regression, how many total days should the patient take the medicine to kill off all the germs? ------------------- 47=_dy(integer)

08D-47. According to Petsmart, the following are daily food recommendations in ounces for dogs of a given weight: (6 lbs, 2.5 oz), (10 lbs, 3.5 oz), (20 lbs, 5.5 oz), (30 lbs, 7.25 oz), (35 lbs, 8.25 oz). What is the best-fit food allocation for a 160 lb Great Dane? ---------- 47=_____lbs

08E-47. Frank practices “putting” or throwing the 12-lb shot for a track and field event. He aims in multiples of 2-meters. His measured throws were 2.4 m, 4.8 m, 5.1 m, 8.3 m, 9.1 m and 12.5 m. What is the regression coefficient for his throws? ------------ 47=_____

08F-47. Paula collected rocks for a project. She intended to collect a set of rocks increasing in size by 1 in increments. Her actual rocks measured 0.95 in, 1.92 in, 3.2 in, 4.15 in and 4.9 in. What is the best-fit rock size estimate for her attempt to find a 7 in rock? ---------- 47=_____in

08G-47. The number of tree leaves scales with the square of its height. What is the best-fit estimate for the number of leaves on a 40-ft tree based on these (height, leaves) data: (5 ft, 3000), (10 ft, 15,000), (15 ft, 27,000), (20 ft, 52,000), (25 ft, 77,000)? ---------- 47=_____leaves

08I-47. A toy dinosaur is 1.25 in long and grows enormously when placed in water. Its length was measured after placing in water at 10 minute intervals: 1.6 in, 2.2 in, 2.9 in, 3.4 in, 4.5 in and 6.25 in. What is the best-fit average linear growth rate? ---------- 47=_____in/min

09B-47. Five 100 gram samples of iron at room temperature received separate heat inputs of 50 to 250 calories in 50 calorie increments. The sample temperatures increased by 5, 10, 12, 16 and 25 Kelvins, respectively. What is percent error in the best fit specific heat of iron if the actual value is 0.106 cal/gK? ---------- 47=_____%

09E-47. Jon is writing a book. He started keeping track of his daily writing after 78 pages were written. On consecutive days, he wrote 5 pages, 8 pages, 3 pages, 9 pages and 6 pages. Estimate the total time required for Jon to completely write the book if the finished book is 478 pages. ---------- 47=_____days

09G-47. Tensile strength is the load a part can carry divided by its cross sectional area. Aluminum cylindrical parts carried loads as a function of

their diameter: (0.25 in, 1800 lbs), (0.5 in, 9000 lbs), (0.75 in, 16,500 lbs), (1 in, 32,000 lbs), (1.25 in, 50,000 lbs). Based on these results, what is the diameter required to carry a load of 22,000 lbs? ---------- 47=_____ in

09H-47. A supervisor assessed daily the total progress made on a home construction at the end of each day. On “Day Zero”, the house was 0% complete. On the first day, the house was 1.5% complete. On Days 2 to 5, the percent of total completion was 3%, 5.5%, 7% and 9%. What is the total time required for the home construction? ---------- 47=_____ days

09I-47. A golfer practices her distance accuracy by attempting to hit balls at 50 yd increments starting with 50 yd. Her actual distances were 40 yd, 120 yd, 180 yd, 130 yd and 240 yd. What is the correlation coefficient for her attempts? ---------- 47=_____

06A-58. What is the correlation coefficient for the line through the points (150,287), (75,160), (20,45) and (205,453)? ---------- 58=_____

06B-58. In golf putting, Georgia tried a 10-ft putt and missed the intended spot by 1 ft. At 20 ft, she missed by 1.7 ft, and at 30 ft she missed by 2.8 ft. What is the best-fit estimate of missing for a 45-ft putt? ---------- 58=_____ ft

06C-58. The actual temperature of a stove was measured in 30° increments starting at a stove knob setting of 100°. The measured values were 98°, 136°, 169°, 200°, and 233°. What is the best-fit estimate stove knob setting for an actual temperature of 350°? -- 58=_____ °

06D-58. What is the best-fit y-intercept for the points (0.33,0.411), (0.98,1.1), (1.3,1.88) and (2.1,2.1)? ---------- 58=_____

06E-58. The daily growth of an organism was monitored. On Day 1 it was 100 μm. On Day 2 through Day 5, the length was 130 μm, 155 μm, 183 μm, and 202 μm. What was its best-fit size on Day 7? ---------- 58=_____ μm

06F-58. The land area and population for several cities are 1000 mi^2, 800,000; 500 mi^2, 350,000; 1500 mi^2, 1,300,000. What is the best-fit diameter of a circular land-area town with a population of 1,000,000? ---------- 58=_____ mi

06G-58. A company’s shipments for Monday through Thursday, respectively, were 2500, 2900, 3700 and 4100. What is the best-fit estimate for the entire work week’s total shipments (Monday through Friday)? --- 58=_____

06H-58. In shuffleboard, Kim tried to push the puck in 10-ft increments starting at 5 ft. His actual measurements were 5 ft, 14.9 ft, 27 ft, 33 ft, 49 ft and 51 ft. What is the estimated best-fit percent error in trying to push the puck 50 ft? ---------- 58=_____ %

06I-58. The mass and volume of various spheres was measured. They were (10 lb, 92 in^3), (30 lb, 330 in^3), (50 lb, 480 in^3) and (100 lb, 1090 in^3). What is the best-fit estimate for the diameter of a sphere that weighs 75 lb? ---------- 58=_____ in

Matrix Algebra

06A-47. What is the Det**B** if $\mathbf{B} = \begin{bmatrix} 35 & 16 & 3 \\ 14 & 7 & 22 \\ 2 & 22 & 16 \end{bmatrix}$? ---------- 47=_____

06B-47. What is a if Det(**AB**) = 28, $\mathbf{A} = \begin{bmatrix} 3 & a \\ 6 & 9 \end{bmatrix}$, **B** = $\begin{bmatrix} 14 & 25 \\ 31 & 19 \end{bmatrix}$? ---------- 47=_____

06C-47. What is the positive value of b if Det**A** = 25 and $\mathbf{A} = \begin{bmatrix} b & -35 \\ -7 & b \end{bmatrix}$? ---------- 47=_____

06D-47. Evaluate Det(**AB**) - Det**A** if $\mathbf{A} = \begin{bmatrix} 95 & 63 \\ 71 & 31 \end{bmatrix}$ and **B** = $\begin{bmatrix} 5 & 9 \\ 2 & 6 \end{bmatrix}$. ---------- 47=_____

06E-47. What is Det**A**/Det**B** if $\mathbf{A} = \begin{bmatrix} 37 & 3 & 9 \\ 3 & 51 & 17 \\ 9 & 17 & 76 \end{bmatrix}$ and **B** = $\begin{bmatrix} 37 & 17 \\ 17 & 76 \end{bmatrix}$? ---------- 47=_____

06F-47. What is b if **C** = **AB**, C_{12} = 9, $\mathbf{A} = \begin{bmatrix} b & 9 \\ 4 & 7 \end{bmatrix}$ and **B** = $\begin{bmatrix} 16 & 11 \\ 3 & 19 \end{bmatrix}$? ---------- 47=_____

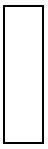
06G-47. If **C** = **B**Det**A**, $\mathbf{B} = \begin{bmatrix} 27 & 14 \\ 61 & 31 \end{bmatrix}$ and $\mathbf{A} = \begin{bmatrix} 9 & 3 & 6 \\ 5 & 7 & 4 \\ 7 & 8 & 1 \end{bmatrix}$, what is C_{22}? ---------- 47=_____ integer

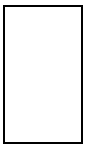
06H-47. If **B** = 5**C**-2**A**, B_{13} = 27, $\mathbf{C} = \begin{bmatrix} -7 & 4 & x \\ -5 & 16 & -5 \\ 6 & 7 & 4 \end{bmatrix}$ and **A** = $\begin{bmatrix} 13 & 5 & 4 \\ 4 & 17 & 6 \\ 6 & 5 & -21 \end{bmatrix}$, what is x? ---------- 47=_____

06I-47. What is B_{11} if **B** = **C**/Det**C** and **C** = $\begin{bmatrix} 29 & -17 \\ 6 & 31 \end{bmatrix}$? ---- 47=_____

05A-58. What is the determinant of  ? -------- 58=_____

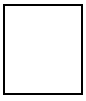
05B-58. For what value of F_{12} does the determinant of the matrix  equal -2500? ---------- 58=_____

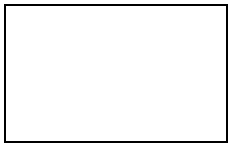
05C-58. If [A] =  and [B] =  , what is C_2 if [C] = [A][B]? ---------- 58=_____

05D-58. [A] =  and [B] =  and [C] = [A][B]. For what value of B_2 does C_3 equal zero? ------ 58=_____

05E-58. What is s_{23} if [s]=3[E]+4[R], [E] =  , and [R] =  ? ---------- 58=_____

05F-58. For what value of x does the determinant of [A][B] = 20 if [A] =  and [B] =  ? ---------- 58=_____

05G-58. What is C_1 if [C] = 5[V][Y], [V] =  and [Y] =  ? ---------- 58=_____

05H-58. What is the determinant of the matrix  ? ---------- 58=_____

05I-58. For what value of y greater than one does the determinant of [A][B] = 2700 if [A] =  and [B] =  ? ---------- 58=_____

07A-58. What is Det**G** if **G** = $\begin{vmatrix} -4 & 9 & 3 \\ 1 & 19 & 2 \\ 7 & -5 & 10 \end{vmatrix}$? ---------- 58=_____

07B-58. For what value of t does $C_{12} = 0$ if **C=AB, A** = $\begin{vmatrix} -2 & t \\ 5 & 1 \end{vmatrix}$ and **B** = $\begin{vmatrix} 9 & 12 \\ -7 & 6 \end{vmatrix}$? ---------- 58=_____

07C-58. What is W_3 if **W** = 15**B**+3**AB**, **A**= $\begin{vmatrix} 8 & -9 & 4 \\ 6 & 13 & 1 \\ 2 & -3 & 8 \end{vmatrix}$ and

B= $\begin{vmatrix} 5 \\ -7 \\ 9 \end{vmatrix}$? ---------- 58=_____

07D-58. For what negative value of h does Det**C** = 99 if **C** = $\begin{vmatrix} 17 & h \\ h & 9 \end{vmatrix}$? ---------- 58=_____

07E-58. Write the value of F_{12} if **F** = -6**G**+9**H**, **G** = $\begin{vmatrix} 9 & 13 \\ 14 & -7 \end{vmatrix}$ and **H** = $\begin{vmatrix} 15 & -7 \\ 6 & 8 \end{vmatrix}$. ---------- 58=_____

07F-58. Calculate L = 6Det**J** if **J** = $\begin{vmatrix} 8 & 9 & 2 \\ 11 & 17 & 11 \\ 5 & 6 & -19 \end{vmatrix}$. ------- 58=_____

07G-58. For what value of x does (7x)Det**N** = 19 if **N** = $\begin{vmatrix} 5/x^3 & 3/x \\ -7/x & 6x \end{vmatrix}$? ---------- 58=_____

07H-58. Calculate $\mathbf{B}_{32}$ if **B** = **AC-C**, **A** = $\begin{vmatrix} 7 & 1 & 3 \\ 6 & -5 & 0 \\ 2 & 9 & 4 \end{vmatrix}$ and **C**

= $\begin{vmatrix} 9 & 2 & -6 \\ 3 & 4 & 7 \\ -5 & 1 & 8 \end{vmatrix}$. ---------- 58=_____

07I-58. For what value of p does Det**Q** = 60p if **Q** = $\begin{vmatrix} 9 & -4 & 6 \\ -4 & p & 8 \\ 6 & 8 & 9 \end{vmatrix}$? ---------- 58=_____

08A-58. What is Det[**A**] if $\begin{bmatrix} -5 & -28 & 79 \\ 47 & 80 & -70 \\ -26 & 70 & -62 \end{bmatrix}$? ---------- 58=_____

08B-58. What is x if $A_3 = 87$, [**B**]= $\begin{bmatrix} 79 \\ -11 \\ 2x \end{bmatrix}$, [**C**] = $\begin{bmatrix} 31 \\ -95 \\ 46 \end{bmatrix}$

and [**A**] = 3[**C**]+5[**B**]? ---------- 58=_____

08C-58. Solve for C_3 if [**C**] = [**A**][**D**]+[**D**], [**A**] = $\begin{bmatrix} 5.2 & -2.5 & -1.7 \\ -6.7 & 9.8 & -0.7 \\ 1.9 & 7.3 & -4.6 \end{bmatrix}$ and [**D**] = $\begin{bmatrix} -20 \\ -10 \\ -38 \end{bmatrix}$. ---------- 58=_____

08D-58. What is C_{12} if [**C**] = [**A**][**B**]-3[**B**], [**A**] = $\begin{bmatrix} -8 & 2 \\ 6 & -9 \end{bmatrix}$ and [**B**] = $\begin{bmatrix} 10 & 17 \\ -7 & 9 \end{bmatrix}$? ---------- 58=_____

08E-58. For what positive x does Det $\begin{bmatrix} -13 & 20 & x \\ 6.3 & 4 & 20 \\ x & 29 & -7 \end{bmatrix}$ = 7,500? ---------- 58=_____

08F-58. What is Det[[**C**][**E**]] if [**C**] = $\begin{bmatrix} 6 & -7 \\ -1 & 6 \end{bmatrix}$ and [**E**] = $\begin{bmatrix} -3 & 7 \\ 9 & 7 \end{bmatrix}$? ---------- 58=_____

08G-58. If [**A**] = $\begin{bmatrix} 8 & 5 & 5 \\ 8 & -9 & 4 \\ -4 & 7 & 9 \end{bmatrix}$ and [**B**] = $\begin{bmatrix} -5 & 6 & 6 \\ -8 & 8 & 2 \\ 4 & 9 & 3 \end{bmatrix}$, solve Det[**C**] if [**C**] = 5[**A**]+9[**B**]. ---------- 58=_____

08H-58. What is d if [**C**] = $\begin{bmatrix} 2 & 7 & 1 \\ 7 & d & 8 \\ 1 & 8 & -5 \end{bmatrix}$, [**B**] = $\begin{bmatrix} 2 & 9 & -6 \\ 9 & 6 & 1 \\ -6 & 1 & 2 \end{bmatrix}$, [**Y**] = [**B**][**C**] and Y_{12} = 0. ---------- 58=_____

08I-58. What is r if Det[**C**] = 0 and [**C**] = $\begin{bmatrix} 4 & -6 & 9 \\ -6 & 7 & r \\ 9 & 3 & 3 \end{bmatrix}$? ---------- 58=_____

09A-58. What is x if **A** = $\begin{bmatrix} 98 & 40 \\ 50 & 91 \end{bmatrix}$, **B** = $\begin{bmatrix} 9 & x \\ 35 & 6 \end{bmatrix}$ and Det(**AB**) = 0? ---------- 58=_____

09B-58. For what value of L_2 does N_2 = 5 if **L** = $\begin{bmatrix} 17 \\ L_2 \\ 13 \end{bmatrix}$, **M** = $\begin{bmatrix} 29 \\ 17 \\ 24 \end{bmatrix}$ and **N** = 6**L** + **M**? ---------- 58=_____

09E-58. Calculate p given that $B_3 = 263$, $\mathbf{C} = \begin{bmatrix} 25 & 16 & 18 \\ 4 & 3 & 3 \\ 6 & 27 & 20 \end{bmatrix}$ and $\mathbf{D} = \begin{bmatrix} 8 \\ 5 \\ p \end{bmatrix}$ and $\mathbf{B} = \mathbf{CD}$. ---------- 58=_____

09F-58. Calculate U_2 if $\mathbf{U} = \mathbf{VW}$, $\mathbf{V} = \begin{bmatrix} 3 & 5 & 1 \\ 4 & 7 & 7 \\ 9 & 2 & 8 \end{bmatrix}$ and $\mathbf{W} = \begin{bmatrix} 2 \\ 0 \\ 5 \end{bmatrix}$. ----- 58=_____

09G-58. Calculate Q_{13} if $\mathbf{R} = \begin{bmatrix} 4 & 16 & 12 \\ 7 & 28 & 22 \\ 22 & 7 & 2 \end{bmatrix}$, $\mathbf{S} = \begin{bmatrix} 24 & 25 & 9 \\ 29 & 28 & 7 \\ 19 & 29 & 4 \end{bmatrix}$ and $\mathbf{Q} = \mathbf{R} + \mathbf{S}$. ---------- 58=_____

09H-58 What is f if $\text{Det}\begin{bmatrix} 23 & 14 & 23 \\ 6 & 21 & f \\ 22 & 0 & 25 \end{bmatrix} = -35$? ---------- 58=_____

09I-58. What is negative h if $\mathbf{J} = \begin{bmatrix} 11 & h \\ h & 27 \end{bmatrix}$, $\mathbf{K} = \begin{bmatrix} 24 & 28 \\ 11 & 19 \end{bmatrix}$ and Det(**JK**) = -9472? ---------- 58=_____

Calculus Fundamentals

Differential Calculus

06A-56. What is the slope of the curve $y = 5x^3 - 3^x$ at x=4? ---------- 56=_____

06B-56. At what value of x does the curve $y = 50\ x^2 - 200x + 20$ have a slope equal to x? ---------- 56=_____

06E-56. For what value of x does the slope of the curve $y = 30x^2 - 10x$ equal 8? ---------- 56=_____

06G-56. At what positive value of x does the function $f(x) = 6x^3\exp(-2x)$ take on its maximum value? ---------- 56=_____

07A-56. What is the smallest positive value of x on the curve $y = 6\tan(\pi x)$ [rad] where the slope equals 2x? ---------- 56=_____

07E-56. What is the maximum value of y for the function $y = -2x^2 - 21x + 7$? ---------- 56=_____

07G-56. What is the value of b if the slope of the function $y = 6x^2 + bx - 9$ equals 25 at x = 3? ---------- 56=_____

07H-56. For what value of x does the slope of the curve $y = -7x^2 + 20x - 7$ equal 5x+3? ---------- 56=_____

08A-56. What is the slope of $y = 4(x-2)^3+16(x+7)^2-24x$ at x = 13? ---------- 56=_____

08B-56. What is the minimum value of y for the function $y = 35x^2-17x+20$? ---------- 56=_____

08C-56. For what value of b does the slope of $y = bx^3+8x^2+b$ equal b at x = 9? ---------- 56=_____

08D-56. At what value of x does the slope of the function $f(x) = 8e^x-7x$ equal 10? ---------- 56=_____

08F-56. At what value of x does the slope (dy/dx) equal -3 for $xy^2-5 = 0$? ---------- 56=_____

08H-56.(rad) What is the slope of the function $f(x) = x\sin(2x-\pi)$ at $x = \pi$? ---------- 56=_____

08I-56. (rad) What is the maximum value of y for $y = 30\sin x - x^2$? ---------- 56=_____

09A-56. At what value of x does the slope of the curve $y = 7^{4x}$ equal 17? ---------- 56=_____

09E-56. What is the minimum value of x for the ellipse $3x^2-5x+y^2 = 238$? ---------- 56=_____

09F-56. For what non-zero value of x is the slope of the curve $y = 8x^3-4x^2+17$ equal to x? ---------- 56=_____

09G-56. (rad) What is the maximum value y for the curve $y = 2x^2\cos(x)-4x\sin(x)$ over the region $0<x<10$? -- 56=_____

09H-56 What is the slope of the curve $y = \frac{7x^2 + x}{2x + 1}$ at x = 21? ---------- 56=_____

06G-57. A curve was drawn such that for all positive values of x, the slope was 1/x. For what value of x does y = 30, if y equals 0 when x = 1? ---------- 57=_____

Integral Calculus

06C-56. What is the integral of the curve $y = 50\sin(3x)$ [rad] between x = 0 and x = 4? ---------- 56=_____

06D-56. What is the area under the curve $y = 40\tan(x)$ [rad] between $x = \pi/8$ and $3\pi/8$? ---------- 56=_____

06F-56. The area under curve $y = 3x\exp(x^2)$ between x = 0 and x = b is 6. What is b, a positive number? ----- 56=_____

06H-56. What is the integral of $y = 6\tan(x/2) + 2$ between x = 0 and $x = 3\pi/4$ radians? ---------- 56=_____

06I-56. The area under the curve $y = (4x)\exp(5-2x^2)$ between x = 0 and x = b is 100. What is b, a positive number? ---------- 56=_____

07B-56. What is the area under the curve defined by $x = 3t-5$ and $y = 2t^2+15t-60$ over the interval $0 \le t \le 10$? ---------- 56=_____

07C-56. Calculate C if $7\int_0^C \left(t + 2^t\right) dt = 100$. ---------- 56=_____

07F-56. What is the area under the curve given by $y = 7\sec^2(3x)$ [rad] over the interval $0 \le x \le \pi/8$? -------- 56=_____

07I-56. Calculate the area under the curve $y = 7^{3x}$ between x = 0 and x = 0.3. ---------- 56=_____

08E-56. What is the integral of the function $f(x) = (5/x)-1$ between $x_0=1$ and x_1 where $f(x_1) = 0$? --- 56=_____

08G-56. What is the absolute value of the area bounded by the x-axis and $y = -6x^2+25x-17$? ---------- 56=_____

09B-56. What is the area under the curve $y = (1+6x^2)^{-1}$ between x = 0 and x = 1.5? ---------- 56=_____

09I-56. What is the area under the curve $y = \frac{x^5}{x^6 - 1}$ between x = 2 and x = 4? ---------- 56=_____

Calculus Applications

Differential Calculus

06D-57. The distance traveled by a jitterbug is given as d = 30tcos(t/40) + 20 where d has units of ft, t is given in seconds, and radian measure is used. If velocity is the derivative of distance, and acceleration is the derivative of velocity, what is the acceleration when the time is 40 seconds? --------- 57=_____ ft/sec^2

09B-57. An algae population was initially 1000 algae, and it doubled every 3 days. What was the growth rate after 6 weeks? ---------- 57=_____ algae/min

Integral Calculus

06B-57. A car accelerates from rest with an acceleration a = 0.3t mph/(hr sec), where t is time in sec. If velocity is the integral with time of acceleration, and distance is the integral with time of velocity, how far has the car traveled when t = 80 sec? ---------- 57=_____ ft

06E-57. Martha's weight w in pounds in her 6th year varied as w = 35+t[3sin(t/20)+20]/800 where t is time in days and radian measure is used. What was her average weight while 6 years old? ---------- 57=_____ lb

07G-57. Suppose an object's acceleration was linearly proportional to the object velocity at any point in time. If the acceleration was 1 ft/s^2 and the velocity was 5 ft/s when time t equaled zero, how far does the object travel in 10 seconds? ---------- 57=_____ ft

08B-57. A 2-in long rubber band is stretched. The required force F increases with increasing length L according to $F = 20(L-2)+2(L-2)^2$ where F is in lbs and L is in inches. If work is the area under the

F-L curve, how much work is needed to extend the rubber band from its original length to a final length of 5 inches? ---------- 57=_____ in-lbs

08C-57. (rad) A particle starts at the origin and moves along the x-axis at a velocity equal to [1/cos(πx/cm)]cm/s. How long does it take the particle to travel to x = 0.5 cm? ---------- 57=_____ sec

09I-57. (rad) A "wobbly" car has an acceleration a = 2t+0.5sin(πt) where t has units of seconds and a is in ft/s^2. How far does the car travel in 10 seconds if it is initially at rest? ---------- 57=_____ ft

Maxima and Minima

05C-57. Firemen at a training school run an obstacle course. They can run a mile in 8.5 min, and they can climb a 20 ft wall in 6 sec. If a fireman was running 50 ft behind another, and the first approaches a wall to climb, what is the closest approach of the two? ---------- 57=_____ ft

05D-57. A string is 1 meter long and forms the outline of a sector of a circle. What is the maximum area that can be obtained in this way? ---------- 57=_____ m^2

05E-57. A rectangle is initially 20 cm by 60 cm. The short dimension is increased by 3 cm/sec while the long dimension is decreased by 4 cm/sec. What is the maximum rectangular area during the process? ------- 57=_____ in^2

05F-57. A container is cylindrical, and the manufacturer wants the container area to be as small as possible for a given volume. What h/D ratio minimizes the container area? ---------- 57=_____

05G-57. A farmer wants to use 200 ft of fence to enclose a rectangular area. One side dimension is a barn wall. What is the largest area that can be enclosed? ---------- 57=_____ ft^2

05H-57. The sum of the diameter and height of a cylinder equals 8 in. What is the diameter that results in maximum cylinder volume? ---------- 57=_____ in

05I-57. If y = 25-(x-5)^2 + sin(πx/2), what value of x (rad) between 3 and 4 is associated with the maximum slope dy/dx? ---------- 57=_____

06F-57. More people buy an item when it costs less, but there is more profit on each item when it is expensive. The number of people buying a piece of furniture per day N is given by $N=200e^{-P/\$300}$, where P is the price in dollars posted on the sales tag. To maximize total income, what should the company charge for each item? ---------- 57= $_____

06I-57. The goal of shoveling is to move the most dirt in the shortest amount of time. The volume of dirt per scoop is 0.2 times w^3, where w is the shovel

width in inches. The number of scoops per minute equals 60exp(-w/4 in). What is the optimum shovel width? ---------- 57=_____ in

07C-57. A rectangle has a perimeter of 45 in, and the side dimensions may be varied. What is maximum volume obtained by rotating the rectangle about one of its edges? ---------- 57=_____ in^3

07D-57. Farmer Jones has 50 ft of fence. He builds a rectangular enclosure outside with one side being the barn and the remaining three sides being the fence. What is the width of the enclosure for which area is maximized? ---------- 57=_____ ft

07F-57. A manufacturer wants to package a constant volume of fluid in a cylindrical container, and he wants to spend as little as possible on the container (that is, minimize container surface area). What is the ratio of the container height to diameter that minimizes the total cylinder surface area? ---------- 57=_____

08A-57. An opened-top paper vessel holds 2 cups of liquid and has a square cross section. What is the vessel height if the least amount of paper is used? ------ 57=_____ in

08F-57. A right triangle with hypotenuse equal to 3 inches is rotated about a leg to produce a cone. What is the maximum volume of the cone? ---------- 57=_____ in^3

08H-57. Two numbers sum to 25 and multiply to P. What is the largest value of P? ---------- 57=_____

08I-57. A 5-in long string is cut into two pieces. One is used to form a circle and one a square. What is the length of the latter piece if the sum of the areas is minimized? ---------- 57=_____ in

09A-57. A triangle has a fixed side dimension of length 7 in, and the opposite angle is also fixed and equal to 37°. What is the maximum triangle area? ---------- 57=_____ in^2

09E-57. A backpacker is 2 miles away from a straight road and 10 miles away from a town. The road goes directly to the town. If the backpacker hikes at 3 mph off-road and 4 mph on the road, at what angle should she hike toward the road (directly towards the road is zero degrees) to get to the town as quickly as possible? ---------- 57=_____ deg

Related Rates

05A-57. Water is diverted from a river to fill a pond at a rate of 100 cubic ft/sec. The pond, initially dry, is frustum shaped with a bed diameter of 150 ft, a maximum depth of 12 ft and a bank diameter of 175 ft. At what rate is the water level changing when the pond is 6 ft deep?---------- 57=_____ fpm

05B-57. Icing is drizzled on top of a fresh-baked, 9-in diameter cake. It is poured on the top center of the cake at a rate of 1 cup/min and the icing thickness is constant. If the icing on the cake is

spreading radially at 0.5 in/s when it reaches the edge of the cake, what is the uniform icing thickness? ---------- 57= _____ in

06A-57. A fungus colony grows as a circle of increasing radius. The velocity of the edge at any time is 0.3 in/hr. What is the circle radius when the fungus area growth rate is 20 in^2/hr? ---------- 57= _____ in

06C-57. A cone 2 ft in diameter and 4 ft tall was inverted and filled with water at 1 ft^3/min. At what vertical height from the cone apex is the water level changing at 6 in/min? ---------- 57= _____ ft

06H-57. Ten people in a community came down sick. The disease then spread such that the number of ill people doubled every 4 days. After what time was the rate of disease contraction 100 people/hr? ---------- 57= _____ days

07A-57. A baseball diamond is a square 90 ft on a side. A batter hits the ball and runs toward first base at 13 ft/s. A first base runner leaves first base running toward second at the same time, moving at 18 ft/s. What is the distance of closest approach of the two runners? ---------- 57= _____ ft

07B-57. A water leak creates a circular puddle. The puddle area increases at a rate of 20 in^2/s. At what puddle diameter is the puddle edge velocity equal to 0.2 in/s? ---------- 57= _____ ft

07E-57. Oshkosh is 50 mi north and 30 mi west of Tallamazoo. A car leaves Oshkosh driving east at 40 mph. Another car leaves Tallamazoo at the same time heading north at 65 mph. What is the closest approach distance between the two vehicles? ---------- 57= _____ mi

07H-57. An inverted cone 18 inches tall and 12 inches in diameter is filled with water at a rate of 15 in^3/min. What is the water volume in the cone when the water level fill rate is 0.5 in/min? ---------- 57= _____ in^3

07I-57. A large, right isosceles triangular prism is placed on a table hypotenuse down. A 12 inch ruler is placed orthogonal to the prism with one end resting on the table 8 inches away from the prism and the other end resting on the prism slant surface. If the ruler end resting on the table moves at 2 in/s, what is the positive magnitude of the velocity of the other ruler end? ---------- 57= _____ in/s

08D-57. Sam pours molasses on the floor at a rate of 0.5 cup/min. Assuming the molasses puddle is circular and of constant thickness equal to 0.05 in, at what diameter is the circle diameter changing at 1 in/min? ---------- 57= _____ in

08E-57. Kim is 5 ft 4 in tall and walks toward a street light that is 18 ft off the ground on a pole.

If her speed is 3 mph, at what negative rate is her shadow changing when she is 12 ft from the light pole? ---------- 57=_____ in/s

08G-57. A cube originally with side dimension a= 3 cm begins to expand at 7 cm^3/s. At what rate is the surface area changing when a = 7 cm? ---------- 57=_____ cm^2/s

09F-57. A rescuer throws a life preserver tied to a rope to a person in the water. The rescuer pulls the rope at 3 ft/sec and stands 5 ft above sea level. How fast is the person in the water moving toward the boat when 10 ft of rope is out? ---------- 57=_____ ft/s

09G-57. A light sits on a pole 25 ft above ground. A ball is raised to the same height and is 35 ft away from the light. If the ball is dropped, at what ball elevation is its shadow moving at 500 ft/sec? --------- 57=_____ ft

09H-57. Sand falls onto a conical pile at a rate of 2 ft^3/min. The angle of restitution is the angle the pile makes with the ground and is 35°. At what pile height is the pile radius increasing at 1 ft/min? ----- 57=_____ ft

Integer Problems

05C-6. What integer is nearest the sum of $\pi^{1.3}$ and 35? ---------- 6=_____ integer

05I-6. The product of three consecutive odd integers is 328,233. What is their sum? ---------- 6=_____ integer

06F-6. How many times can 0.886 be divided by 0.092 with a positive remainder? ---------- 6=_____ integer

08F-6. How many times can 9850 be divided by 7.3 with a positive remainder? ---------- 6=_____ integer

09A-6. What is the remainder of 8361 divided by 6? ---- 6=_____ integer

09H-6. Two consecutive integers sum to 31. What is their product? ---------- 6=_____ integer

09I-6. What integer is closest to six times 9,575/31.4? ---------- 6=_____ integer

05A-7. The product of three consecutive integers is 1,815,726. What is their average? ---------- 7=_____ integer

07I-7. What is the closest integer to the product of e^3 and 28? ---------- 7=_____ integer

09E-7. What is the sum of the number of days in a week, the number of cards in a deck (no jokers) and the number of feet in the playing length of a football field? ---------- 7=_____ integer

05H-8. A 4x8 sheet of drywall has dimensions of 4 ft by 8 ft. If a gallon of paint covers 400 sq. ft, how many sheets of drywall can be painted with a gallon of paint? Assume only one side of the sheet is painted and that two coats are required. ---------- 8=_____ integer

06B-8. A printer prints 8 pages per minute. How many pages does it print continuously in an hour? ---------- 8=_____ integer

06H-8. What is the smallest value of n such that $8.1^n>2500$? ---------- 8=_____ integer

06I-8. What minimum number of 12-oz containers are needed to hold 2 gallons of liquid? ---------- 8= integer

07C-8. What is the sum of the integers between and including 1 to 20? ---------- 8= integer

07E-8. What is n if 9^n equals 387,420,489? ---------- 8= integer

08F-8. A ball recovers 91% of its height when it bounces. If it were dropped from a height of 30 inches, after what minimum number of bounces is the height less than 6 in? ---------- 8= integer

08G-8. According to the Americans with Disabilities Act, a wheelchair ramp is specified to have one inch of rise for every (horizontal) foot of run. How many 8-ft long sheets of plywood are needed to make a wheelchair ramp that makes a vertical rise of 4 ft 7 in? ---------- 8= integer

05H-16. A string is 100 ft. long. How many times does it have to be folded in half before the resulting length is just less than 2 ft? ---------- 16= integer

07E-16. At Schitterbahn it takes 6 min to walk to a ride, 25 min waiting in line and 13 min to ride the ride. How many rides can we ride if we arrive at the park at 10 AM and leave at 7 PM? Neglect meal time. --- 16= integer

07F-16. What is the largest number of 8.5 in by 11 in rectangular pieces that may be cut from a 2 ft by 3 ft sheet of poster board? ---------- 16= integer

08I-16. The product of two consecutive positive integers is 118,680. What is their sum? ---------- 16= integer

05F-17. Find the integer n such that $(10n)^{n/5}$ comes closest to 10^9. ---------- 17= integer

06E-17. A sheep pen is 75 ft long, 31 ft wide and is composed of barbed wire attached to vertical poles. If a pole must be at each corner, and poles must be no more than 8 ft apart, what is the fewest number of poles needed? ---------- 17= integer

08E-17. A three digit number is a multiple of 8 and 17. The sum of the digits is 13. What is the three digit number? ---------- 17= integer

05E-18. Lava cools slowly. In 1990, some lava had a temperature of 200° and in 2000 the temperature was 182°. The final temperature is 80°, the annual average temperature at the location of the lava. During what year is the lava 100° if the temperature approaches the limit exponentially? ---------- 18= integer

06C-18. The average of three consecutive integers is 38. What is their product? ---------- 18= integer

06D-18. A second, two-digit number is created by reversing the digits of the first two-digit number. The sum of these numbers is 77 and their product is 1,462. What is the smaller two-digit number? --------- 18= integer

06E-18. Marge has pennies, nickels and dimes. She has 30 coins valued at $1.39, and she has twice as many pennies as nickels. How many dimes does she have? ---------- 18= integer

06G-18. Peter is 5 years older than Paul, and Paul is half as old as Mary. If their ages sum to 73, how old is Mary? ---------- 18= integer

09H-18. The moon cycles through its phases every 28 days. If there was a full moon on April 19, on what day in May will it be full again? ---------- 18= integer

05C-26. A 16-oz. bottle of bug spray covers 16,000 square feet. How many bottles are needed to spray an area of 0.71 acres? ---------- 26= integer

06I-26. Sarah stands 8 ft from a wall. She jumps towards the wall, covering half the distance each jump. How many jumps does she make to move within one inch of the wall? ---------- 26= integer

07A-26. The product of two consecutive odd integers is 2499. What is the larger integer? ---------- 26= integer

06H-27. In a room with 300 people there were 18 left-handed women. If 9% of the population is left handed, how many right-handed men were in the room? --- 27= integer

07H-27. x and y are integers. If $x^2-y^2 = -2581$ and $x-y = -29$, what is y? ---------- 27= integer

07I-27. Megan has 49 coins. She has three times as many dimes as quarters, six times as many pennies as nickels and the total value is $4.18. How many dimes does she have? ---------- 27= integer

09E-27. The monthly payment MP equals $P\left[i + \frac{i}{(1+i)^n - 1}\right]$ where P is the principal, i is the annual interest rate divided by 12 and n is the number of months. If Harry can afford to pay $350 monthly for a car, and the annual interest rate is 5.4%, how many months will it take him to pay out a $19,900 loan? ---------- 27= mo(integer)

05B-28. The great pyramid of Khufu was constructed in 2589 BC with a height of 481.4 ft. Due to weathering, in 2004 its height was 449 ft. Estimate the year during which it will be 440 ft assuming a linear decrease. Note that the year following 1 BC is 1 AD. ---------- 28= integer

05D-28. When you sweep the floor, you get 91% of the dirt. How many times do you have to sweep to get 99.9% of the dirt? ---------- 28= integer

05G-28. A gardener plants 20 ft of a row with bean seeds spaced 3 inches apart. 80% of the seeds sprout and 60.9% of those are eaten by bugs. How many bean plants survive? ---------- 28= integer

08C-28. Tresa has 32 coins totaling $2.35. She has an equal number of nickels and quarters, and three times as many pennies as quarters. How many dimes does she have? ---------- 28= integer

05I-36. Prostate cancer doubles in mass every six years. If a cancer is 0.5 mm in diameter in the spring of 2004, in what year will it be 1 mm in diameter? ---------- 36= integer

07B-36. Three consecutive integers are selected. The percent difference between the smallest and largest integers is 2.5%. What is the middle integer? -------- 36= integer

07D-36. Rod letters a sign by hand in 11 minutes, but it only takes 2 minutes if he uses a stencil. If he needs 45 minutes to make the stencil, what is the number of signs for which using a stencil takes as much time as lettering by hand? ---------- 36= integer

06D-37. Oma Ruth is 3 times as old as her granddaughter, and in 6 years the difference in their age will be 48 years. How old is Oma Ruth? ---------- 37= yr(integer)

06I-37. A circular pie is sliced and served to 3 children. The amount each child received was proportional to their age. The largest piece was 3 times the size of the smallest. The angle of the middle piece was 120°. If the middle child was 4 years older than the youngest child, how old was the oldest child? ---------- 37= yr(integer)

05D-38. A shepherd shears two sheep to get exactly enough wool to clothe his two children, who are 4 and 6 years old. Five years later he has children that are 3, 9, and 11 years old. Assuming heights increase as $(age)^{0.8}$, how many sheep does he now need to shear to provide clothing for his children? ---- 38= integer

06A-38. A mathematical "cycle" involves cubing a number, dividing by 2 and then taking the square root of the result. What fewest number of cycles is needed to increase a starting number of 10 to a number exceeding 1000? ---------- 38= integer

09E-38. Lenny starts with a full, 2-cup container of 30% salt solution. He divides the solution in half. To one half, he adds water to double the volume and refills the original container, discarding the left-over mixture. How many times must this procedure be done to dilute the original 30% solution down to just less than 5%? ---------- 38= integer

09G-46. The thickness and width of a book are each proportional to its height. One shelf holds 28 9-in tall books, which is the capacity both of the shelf length and the shelf load bearing. What is the largest number of 12-in tall books the shelf can hold? ---------- 46= integer

08H-47. The population of Texas in ten-year increments starting in 1960 is 9.92 million, 12.1

million, 14.5 million, 17.2 million and 20.1 million. Based on these, predict the year in which the population will exceed 35 million. ---------- 47= integer

09A-47. Kayleigh's typing speed increased daily (words per min = wpm): 35 wpm, 42 wpm, 50 wpm, 56 wpm, 61 wpm. After how many more days will her typing speed break 100 wpm? ---------- 47= integer days

09F-47. A company produces a spinning top. Their consecutive monthly shipments of tops were 1000, 3500, 3800, 6500, 6500, and 7500. After how many more months will their estimated monthly shipments equal or exceed 30,000 tops? ---------- 47= integer mo

Dollar Sign Problems

07H-6. Joey used quarters to buy an item costing $29.38. How much change did he receive? ---------- 6= $

07I-6. Three friends go in together to buy a $35.49 game. If they split the amount equally, how much does each contribute? ---------- 6= $

08I-6. Uma buys a $15.75 book. After paying 8.125% tax, how much change does she receive from a $20 bill? ---------- 6= $

07E-7. Penny bought three non-taxable items costing $3.59, $4.99 and $9.50. How much change did she receive from a $20 bill? ---------- 7= $

08D-7. Mandy buys a blouse totaling $18.75. If the sales tax was 8.25%, what was the cost of the item before tax? ---------- 7= $

09B-7. Gas was $3.15/gal a month ago but jumped to $3.98/gal. How much extra does it cost to gas up a car with an empty 18-gallon tank? ---------- 7= $

09I-7. Megan bought four tax-free items costing $9.25, $8.50, $2.99 and $12.35. How much change did she get from a $50 bill? ---------- 7= $

05E-8. A cooperative store has a 100% markup on certain items like jewelry. If a coop member bought watch on sale that was originally $50 but was 30% off, what was the store's profit on the watch if they pay a year-end rebate to all members of 10% of profits? ---------- 8= $

08E-8. The postage rate for first-class letters recently increased from 39 cents to 41 cents. If 60% of the 302 million people in the US mail three first-class letters each month, what is the annual increase in income to the Post Office? ---------- 8= $

05F-16. Fred has 11 coins that are worth $1.85. If the coins are only quarters and dimes, what is the value of the dimes? ---------- 16= $

05G-16. Peter bought 4 items costing $3.59, $4.99, $2.50 and $3.49. If the tax rate was 8.25% and the last two items were not taxed, how much change does

Peter receive from a twenty-dollar bill? Tax is rounded up to the nearest penny. ---------- 16= $

06D-16. Stephanie works 30 hours per week for 50 weeks and grosses $19,000. What is her hourly income? ---------- 16= $

06G-16. Two kinds of bulk nuts cost $8.99/lb and $12.99/lb. Abby buys 0.8 lbs of each, and no sales tax is charged. How much change does she receive from $20? ---------- 16= $

07B-16. What is the interest earned from investing $20,000 for 8 years at 4.5% annual interest? ---------- 16= $

08F-16. Lana invests an amount x for 10 years at an average annual interest rate of 5.5%. If she yields $50,000 principal and interest at the end, what is x? ---------- 16= $

09A-16. In April 2008, The Austin newspaper increased its newsstand price from 50 cents to 75 cents. Assuming that 50,000 papers were sold daily before the price hike and that readership dropped by 20% after the hike, what is the total daily increase in income to the publisher? ---------- 16= $

09H-17. How much money should Julian invest today at 4% annualized interest to end up with $10,000 5 years from now? ---------- 17= $

05G-18. I just bought four tires for my car and paid $320.42. They gave me $50 before tax for one of my old tires and the sales tax was 8.25%. What was the original price for each of the four tires? ---------- 18= $

06A-18. Water costs $0.18 per gallon, and a container costs $0.29. If the profit is 90% of costs, what is the selling price for a 20 oz bottle of water? -------- 18= $

06B-18. What is the additional income gained by investing $5,350 at 3.5% annual interest for 6 years? ---------- 18= $

06C-26. What is the total cost for 32 people to spend a day at Fiesta Texas, including one meal? The group admission cost is $21.99 per person, and a meal ticket is $7.99 per person. Groups get one free admission for every 25 people. ---------- 26= $

09G-26. The monthly payment MP equals $P\left[i + \frac{i}{(1+i)^n - 1}\right]$ where P is the principal, i is the annual interest rate divided by 12 and n is the number of months. What is Sheila's monthly payment if she borrows $150,000 for a house at an annual interest rate of 6.47% and pays it out over 30 years? ---------- 26= $

07D-27. A game show awarded $50 to winning contestants in 1964. How much money would that be in 2007 if the inflation rate was 2.74%? ---------- 27= $

09F-27. Samantha is contemplating purchasing a car that costs $24,900. She can pay cash from savings or take out a loan. The loan requires a $2000 down payment and 48 monthly payments of $545.72. If she does the loan, how much total interest will she pay? -- 27= $

05A-28. A mechanic's time is charged at $45/hour, but the time is the time a repair manual says is required for the repair. If a good mechanic can complete the job in 80% of the book time, what is the true rate that the repair shop receives for an hour of the mechanic's time? ---------- 28= $

07F-36. Jessica wants to make $25 by selling 1 gallon of lemonade. She spends $1.25 on lemons, $2.50 on sugar, $1.19 on glasses and water was free. If the glasses are 10-ounce, and she drinks the leftover fraction of a glass, what must she charge per glass to just clear $25 profit? ---------- 36= $

07G-36. Kaitlynn makes four equal annual payments to a bank that pays 6% annual interest. At the end of the fourth year, she has earned $500. How much was one of the four payments? ---------- 36= $

08G-46. The cost of a pearl is proportional to the square of the diameter. If a 17-in long, single-strand pearl necklace with 7 mm diameter pearls costs $850, what is the necklace cost if 10 mm pearls were used? The necklace holds the maximum number of pearls, and pearls cannot be split. ---------- 46= $

09E-46. A stone mason stacks rectangular cut stones to build a wall of fixed height and length. The stones are available in different sizes but have the same shape. The cost of a stone is proportional to its volume. If the wall materials cost is $2000 when an 8-in stone is used, what is the cost of the wall when 10-in stones are used? ---------- 46= $

Significant Digit Problems

05E-7. Lake Buchanan near Austin filled during the rains of June 2004. The lake volume was 843,065 acre-ft, and the elevation was 1018 ft. The lake area is 22,335 acres. What is the average lake depth? ---------- 7= ft(SD)

07F-17. Sam Hornish, Jr. won the 2006 500-mile Indy 500 race with a driving time of 3 hr 58 min 45.54 sec. What was his average speed? ---------- 17= mph(SD)

08B-17. What is the volume of a bread box if a loaf is rectangular with dimensions, 14.39 in, 6.29 in and 5.88 in? Assume the bread box is 42% larger by volume than a loaf of bread. ---------- 17= in^3(SD)

08F-17.If there are 1,017,018 species of insects in the world and the land area of the earth is 148,939,100 km^2, how many different species are on average in Nacogdoches, Texas with a land area of 25.23 mi^2? ---------- 17= (SD)

07H-18. Mt. Everest is 29,003 ft above sea level and the greatest depth on earth is 34,219 ft. What is the distance from the highest point to the lowest point on earth expressed as a fraction of the earth's radius? ---------- 18=_____%(SD)

07D-26. The Leaning Tower of Pisa is 15.484 m in diameter. The tower is 55.86 m on the lowest side and 56.70 m on the highest side. At what angle relative to the vertical does the tower lean? ---------- 26=_____deg(SD)

08G-26. Abby hikes 3 mi in 33 min 48 s, but she runs this distance at a 7 min 57 s per mi pace. What is the percent difference in running and hiking time for 3 mi? ---------- 26=_____%(SD)

08I-26. The world 1-hr record for human powered vehicles was broken on July 6, 2006 by "Fast Freddy" Markham who pedaled 53.43 mi. The old record was 52.33 mi. What is the percent difference in these distances? ---------- 26=_____%(SD)

09I-26. The sun mass is 1.991×10^{30} kg, and it is composed mostly of hydrogen. The molecular weight of a hydrogen atom is 1.00794 g/mol, and there are $6.02214199 \times 10^{23}$ atoms/mol. Estimate the number of atoms in the sun. ---------- 26=_____atoms(SD)

06F-27. If a yard stick casts a shadow on the ground 20.6 in long, how tall is a tower casting a shadow of 957 ft? ---------- 27=_____ft(SD)

06I-27. Two cars leave La Feria driving in the same direction at 54.7 mph and 61.3 mph, respectively. How far ahead is the lead car after 5 hr 26 min? ------- 27=_____mi(SD)

09B-27. What is the percent difference in the total land area of Iowa, 55,875 mi^2, and Illinois, 55,593 mi^2? ---------- 27=_____%(SD)

07E-28. Hana leaves Albuquerque driving north at 65.8 mph, and Hank leaves Albuquerque at the same time driving east at 74.2 mph. How far apart are they after 2 hr 42 min? ---------- 28=_____mi(SD)

09E-28. NASA sent the Phoenix Probe to Mars in 2007/08. It traveled 423 million mi on the trip from Earth to Mars. If the mean orbital radii of the Earth and Mars are 1.496×10^8 km and 2.279×10^8 km, respectively, what is the percent difference in the average closest approach of the planets and the distance Phoenix traveled? ---------- 28=_____%(SD)

09F-28. In 2007, a popular drink manufacturer reduced the empty weight of their 330 ml capacity glass bottle to 210 g. What is the total weight of a six-pack of filled drink bottles? ---------- 28=_____lbs(SD)

09G-28. Irene chops 62 bell peppers in one hour, and Tim chops 45 bell peppers. Irene worked alone 1 hr, and then she was joined by Tim. How long did they

work together if a total of 550 bell peppers were chopped? ---------- 28=_____hr(SD)

09H-28. The amount of radioactive C^{14} in plants is constant at 1 part per trillion (ppt) until the plant dies. Then the C^{14} radio-decays with a half life of 5730 yr. If Aaron's Rod were now 3850 years old, what would be the C^{14} concentration? ---------- 28=_____ppt(SD)

09I-28. NASA sent the Phoenix Probe to Mars. It traveled 423 million mi, leaving earth on Aug. 4, 2007 and landing on Mars on May 25, 2008. What was the probe's average velocity divided by its maximum velocity, 74,000 mph? ---------- 28=_____(SD)

07A-36. A landowner 'steps off' a boundary and estimates a distance of 1152 ft. A surveyor measures the distance to be 1176.37 ft. What is the percent error in the landowner's estimate? ---------- 36=_____%(SD)

06G-37. A swimming pool fills in 5 hr 17 min and drains in 4 hr 35 min. How long would it take to fill a pool if the drain were half open? ---------- 37=_____hr(SD)

06H-37. A band piece lasts 5 min 35 s when played at a 63 beats/min tempo. What tempo is needed if the piece duration is 6 min? ---------- 37=_____Beats/min(SD)

07C-37. If the Sun were the diameter of a period on this page, 650 μm, then the nearest star, Alpha Centauri, would be 13.6 km away. If the sun diameter is actually 1.392×10^{9} m, and a light year (ly) is 5.87851×10^{12} miles, what is the actual distance between these stars? ---------- 37=_____ly(SD)

07G-37. A digital song lasts 2 min 23 sec and takes 2.20 megabytes of memory. How long would it take to play a fully loaded 29.8 gigabyte ipod digital music player? Assume 1 gigabyte equals 1000 megabytes. ------- 37=_____hr(SD)

05A-38. A pendulum has a period that is proportional to the square of its distance from the center of the earth and inverse proportional to its length. If a 24-inch pendulum has a 2 second period at sea level, what would be the period of a 20-inch pendulum at altitude of 1 mile? ---------- 38=_____sec(SD)

05G-38. The current accepted elevation of Mount Everest, 29,028 feet, was arrived at in 1954 by the Indian Surveyor B. L. Gulatee. Recent measurements using electronic methods give an elevation of 8,831.2 meters. What is the percent difference between the heights of Mt. Everest if the heights are measured from the center of the earth? ---------- 38=_____%(SD)

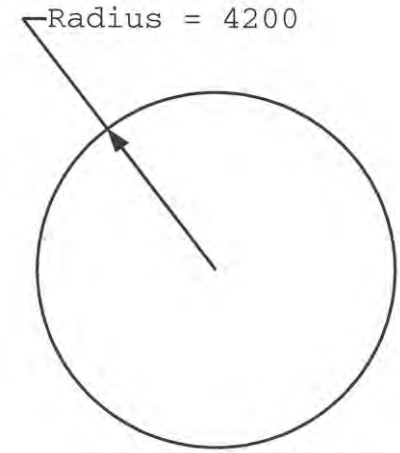
06I-38. Peter had two measuring tapes, one for long distances and one for short distances. He measured a length by combining both. One tape read 54.6 yards, and the other read 24.9 ft. What was the total length? ---------- 38=_____yd(SD)

07H-38. Kyle stands 30.4 ft away from a 9.4 ft tall wall. He throws a small ball and clears the wall by 7.2 ft. If the ball was released at arm-height, 4.6 ft, and the ball's maximum height was at the wall, what was the angle the trajectory made with the ground at release? ---------- 38=_____deg(SD)

08E-46. The area of Brazil on a 12.2-in diameter globe was estimated to be 7.25 in^2. What is the percent error in the actual land area estimate for Brazil from the globe if the actual land area is 8.45651×10^6 km^2? ---------- 46=_____%(SD)

08I-46. On a Texas map scaled at 1:1,100,000, the straight-line distance from San Antonio to Victoria is 5.77 in. In exactly the opposite direction, the distance from San Antonio to Pecos measures 18.9 in. What is the actual distance between Pecos and Victoria? ---------- 46=_____mi(SD)

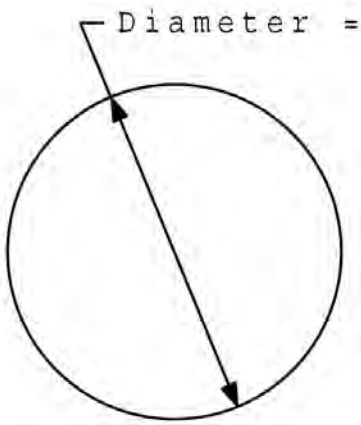
06I-9. CIRCLE



Diameter = ?

06I-9 = _____

05E-9. CIRCLE

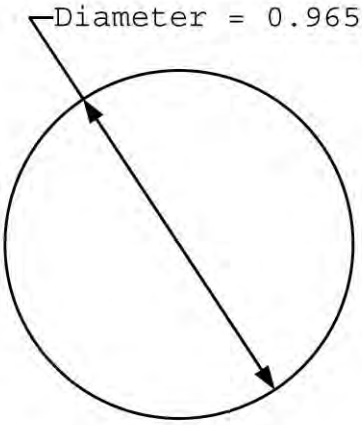


AREA = ?

05E-9 = _____

09A-9.

CIRCLE

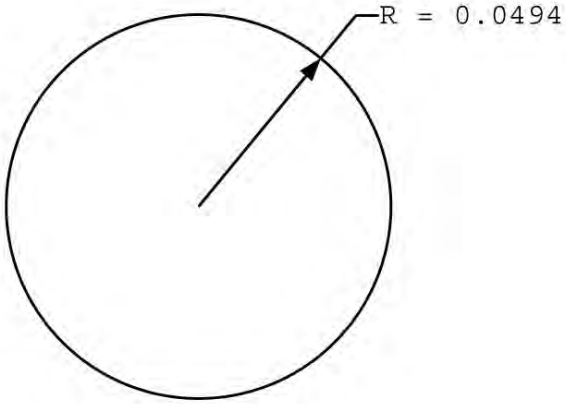


Area = ?

09A-9 = _____

08B-9.

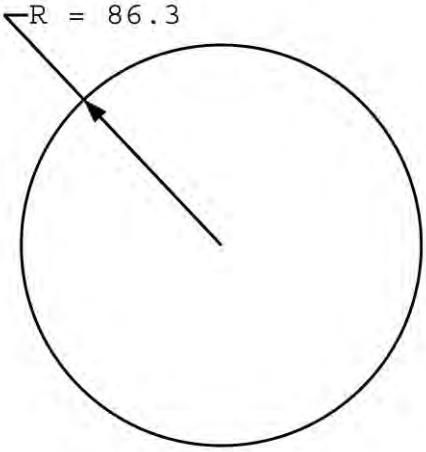
CIRCLE



AREA = ?

08B-9 = _____

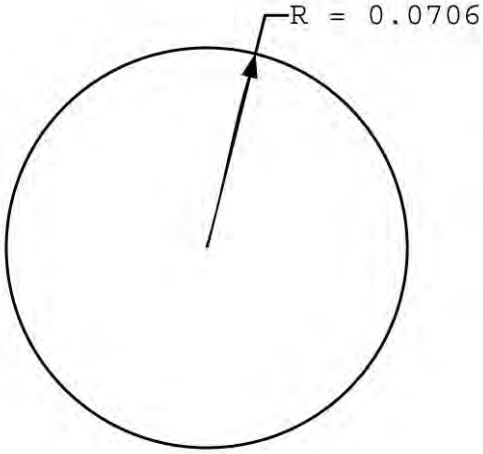
08F-10. CIRCLE



AREA = ?

08F-10 = _____

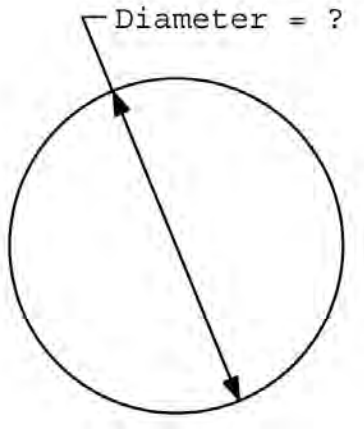
08I-9. CIRCLE



AREA = ?

08I-9 = _____

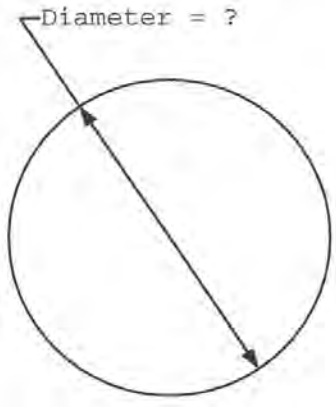
05H-10. CIRCLE



AREA = 0.264

05H-10 = _____

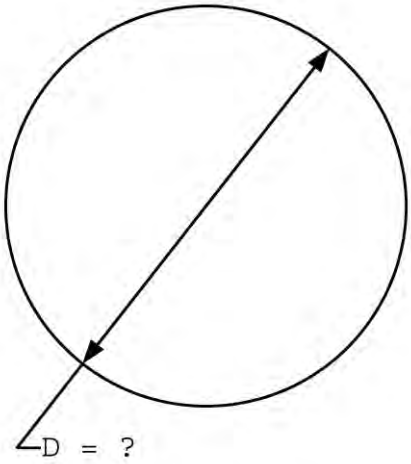
06D-10. CIRCLE



Area = 2.72

06D-10 = _____

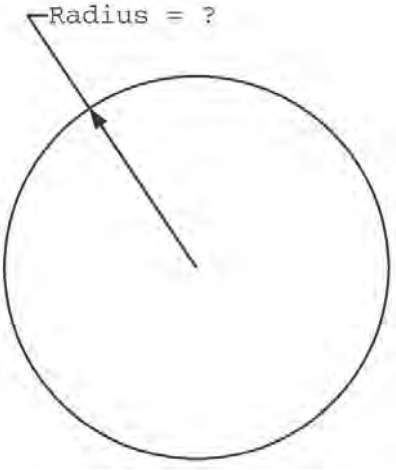
08H-9. CIRCLE



AREA = 85

08H-9 = _____

06C-9. CIRCLE

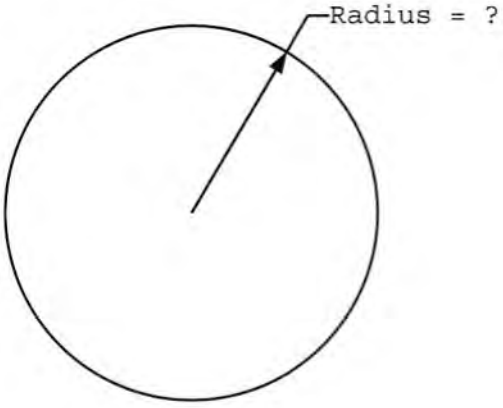


Area = 5.31

06C-9 = _____

07A-9.

CIRCLE

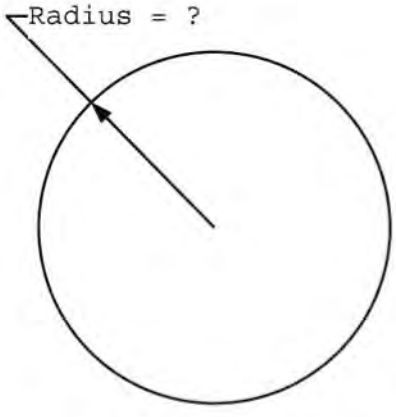


Area = 26.4

07A-9 = _____

07F-9.

CIRCLE

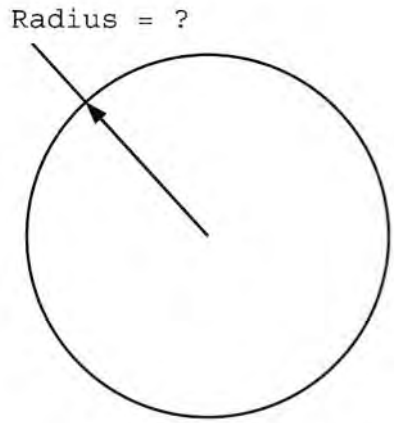


Area = 0.0647

07F-9 = _____

07I-10.

CIRCLE

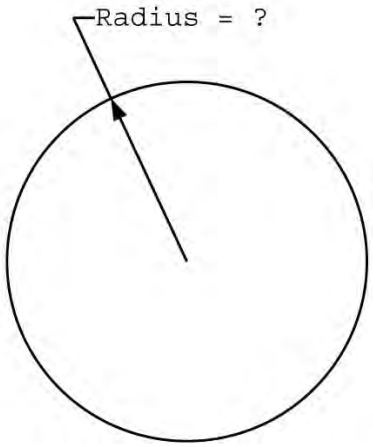


Area = 9.71

07I-10 = _____

09H-9.

CIRCLE

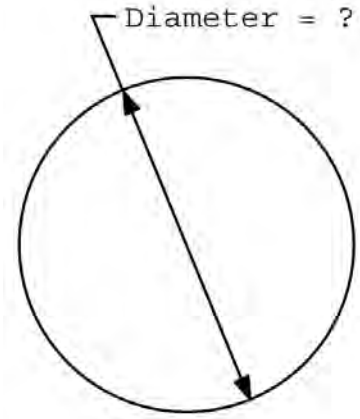


Area = 7420

09H-9 = _____

05B-10.

CIRCLE

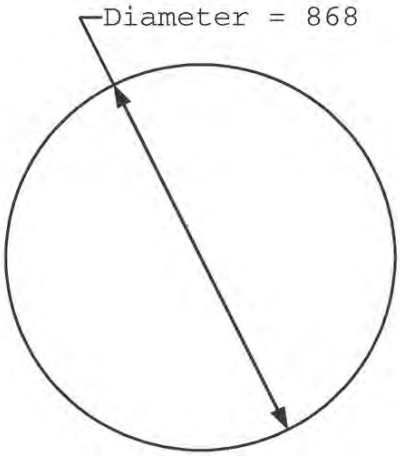


Circumference = 5560

05B-10 = _____

06B-10.

CIRCLE

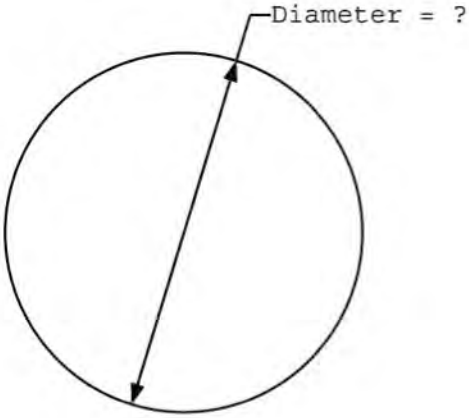


Circumference = ?

06B-10 = _____

07C-10.

CIRCLE

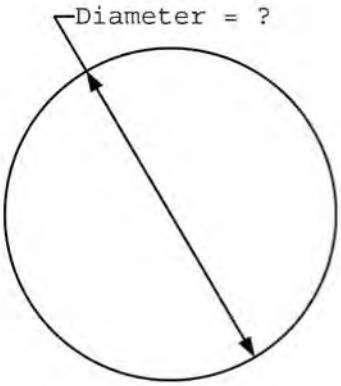


Circumference = 7.28

07C-10 = _____

07G-9.

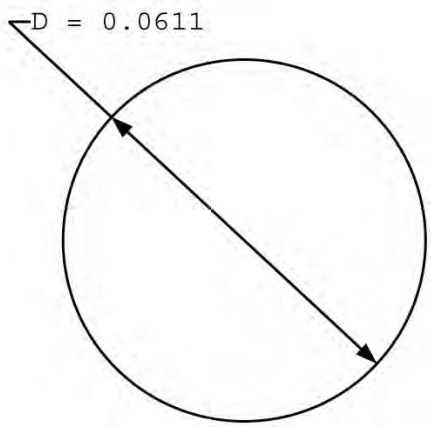
CIRCLE



Circumference = 0.451

07G-9 = _____

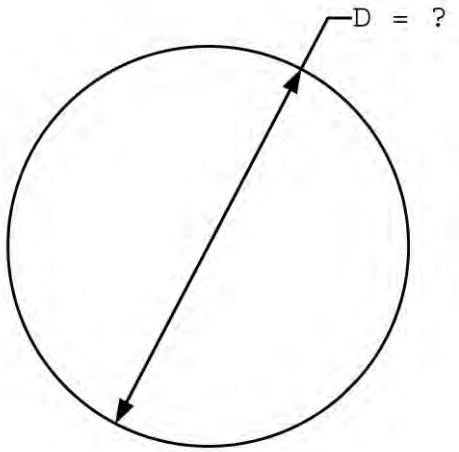
08A-10. CIRCLE



CIRCUMFERENCE = ?

08A-10 = _____

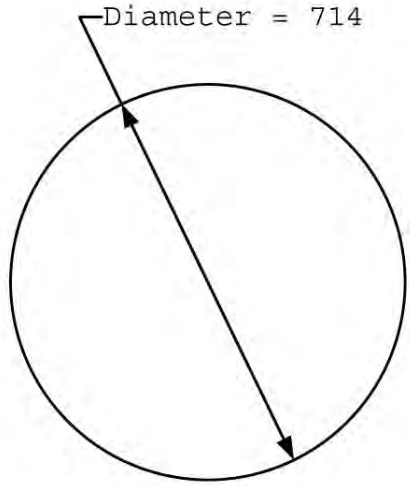
08E-10. CIRCLE



CIRCUMFERENCE = 0.643

08E-10 = _____

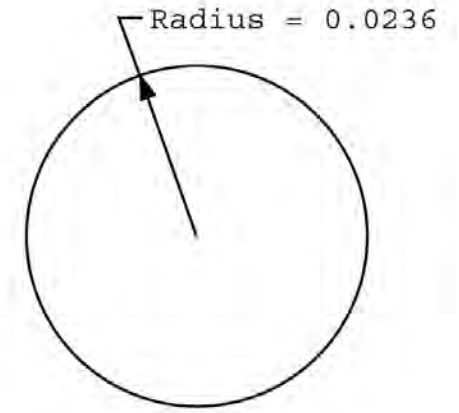
09I-10. CIRCLE



Circumference = ?

09I-10 = _____

05D-9. CIRCLE

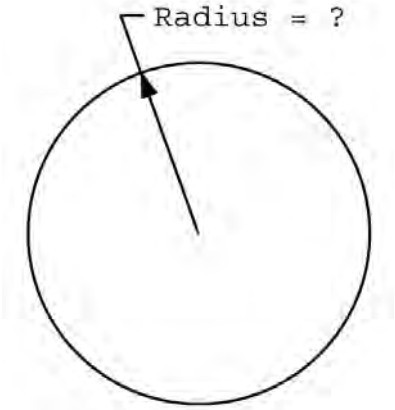


Circumference = ?

05D-9 = _____

05F-9.

CIRCLE

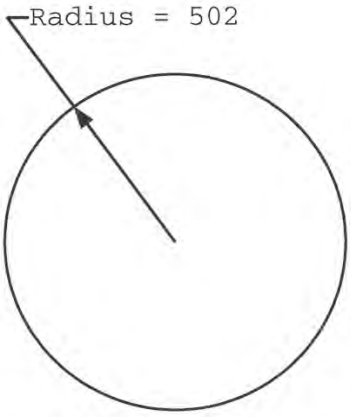


Circumference = 2790

05F-9 = _____

06F-9.

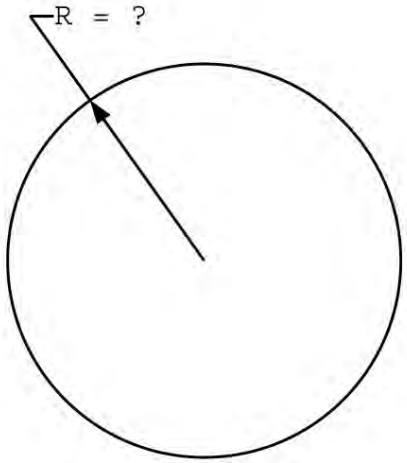
CIRCLE



Circumference = ?

06F-9 = _____

08D-10. CIRCLE

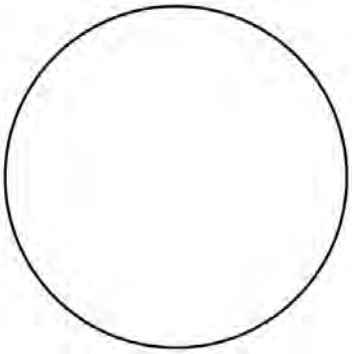


CIRCUMFERENCE = 3530

08D-10 = _____

05I-10. CIRCLE

AREA = 580



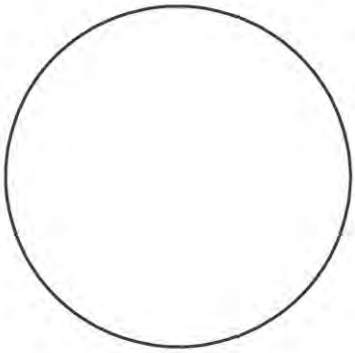
Circumference = ?

05I-10 = _____

06H-9.

CIRCLE

Circumference = 780

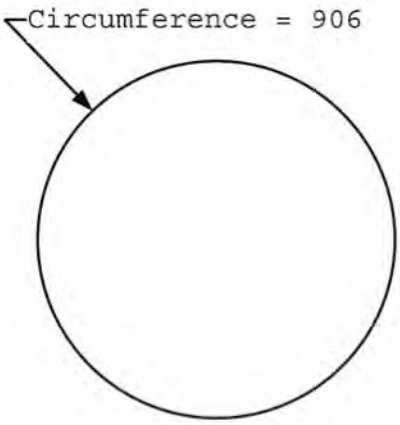


Area = ?

06H-9 = _____

07D-10.

CIRCLE

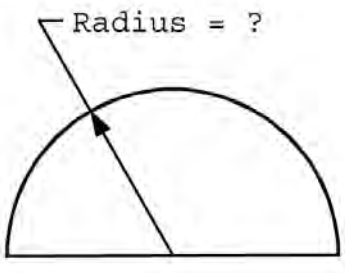


Are a = ?

07D-10 = _____

05A-9.

SEMICIRCLE

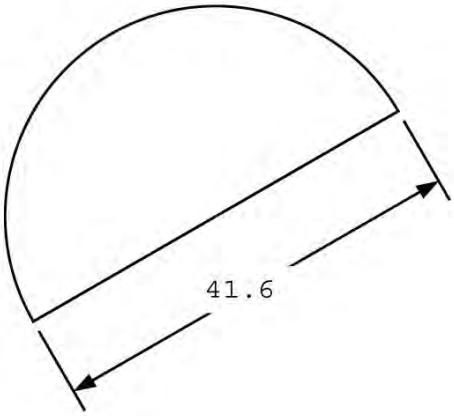


AREA = 0.259

05A-9 = _____

09G-10.

SEMICIRCLE

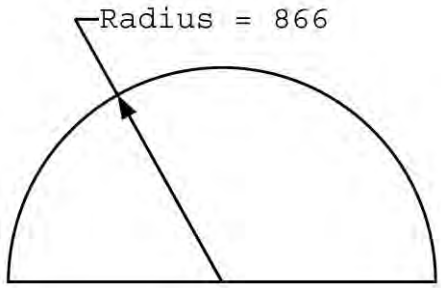


Area = ?

09G-10 = _____

09B-9.

SEMICIRCLE

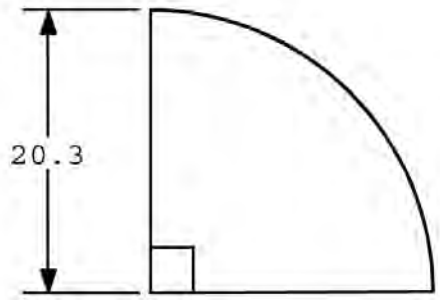


Perimeter = ?

09B-9 = _____

05C-10.

QUARTER CIRCLE

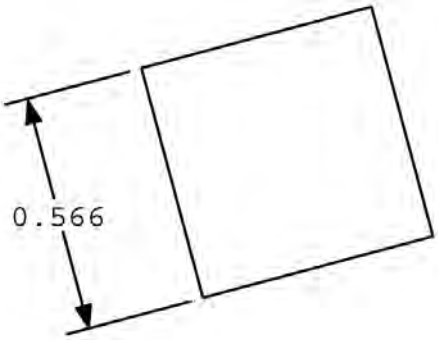


Perimeter = ?

05C-10 = _____

05F-10.

SQUARE

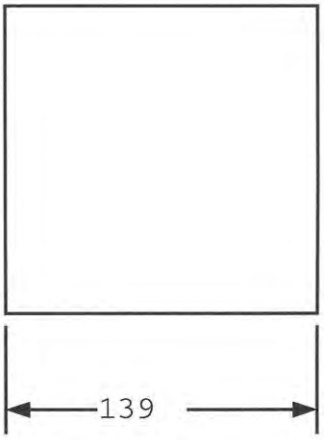


AREA = ?

05F-10 = _____

06A-10.

SQUARE

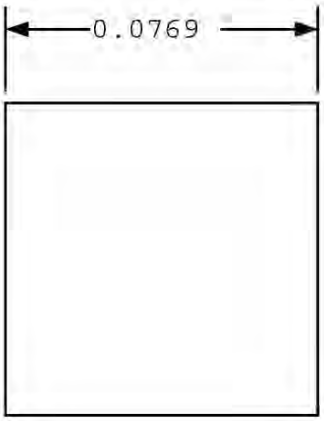


Area = ?

06A-10 = _____

09E-9.

SQUARE

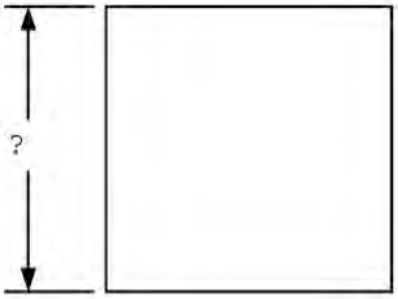


Area = ?

09E-9 = _____

07D-9.

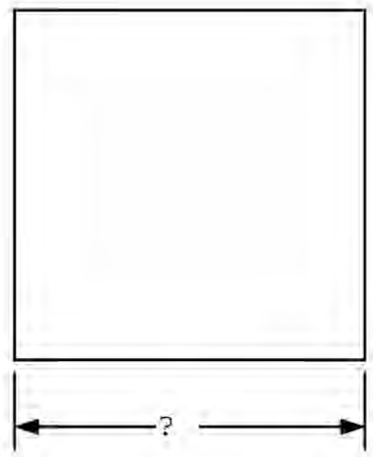
SQUARE



Area = 0.982

07D-9 = _____

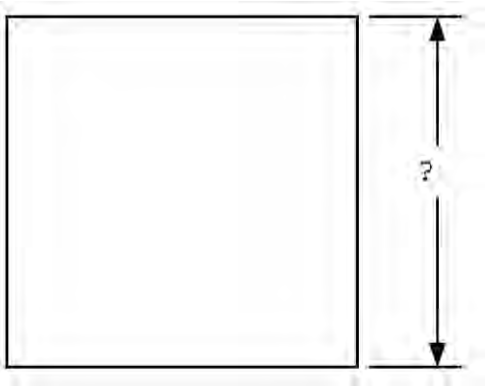
08F-9. SQUARE



AREA = 0.0936

08F-9 = _____

08G-9. SQUARE

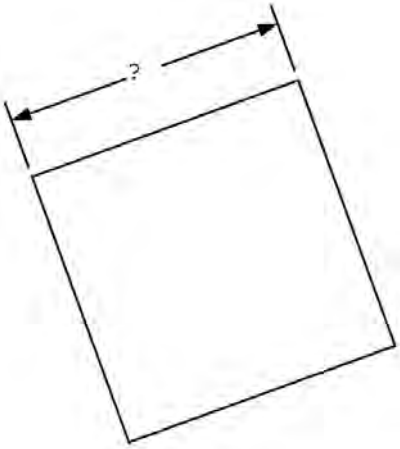


AREA = 34

08G-9 = _____

09I-9.

SQUARE

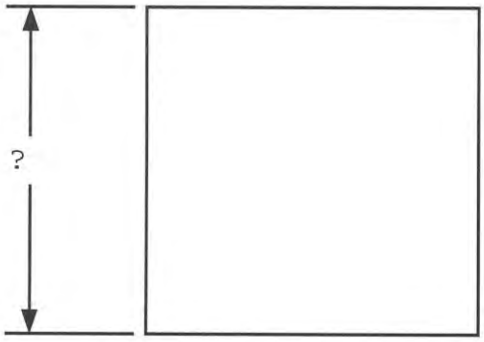


Area = 2770

09I-9 = _____

06G-9.

SQUARE

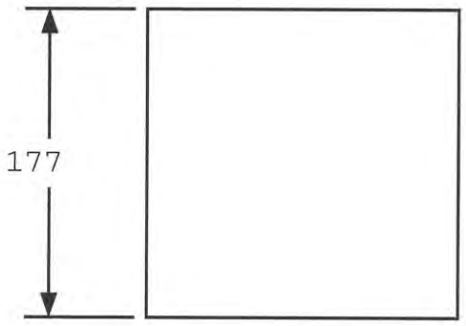


Perimeter = 0.355

06G-9 = _____

06H-10.

SQUARE

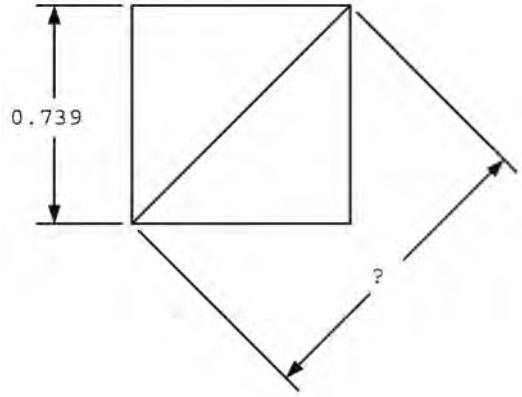


Perimeter = ?

06H-10 = _____

07E-10.

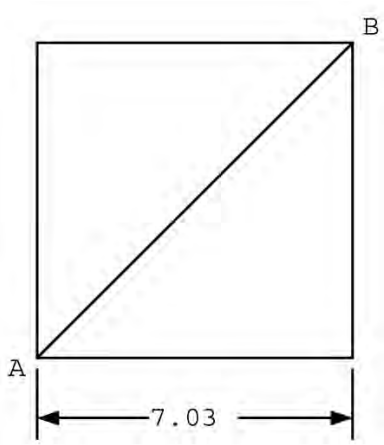
SQUARE



07E-10 = _____

08C-10.

SQUARE



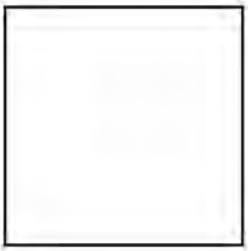
AB = ?

08C-10 = _____

05D-10.

SQUARE

Perimeter = 3.79



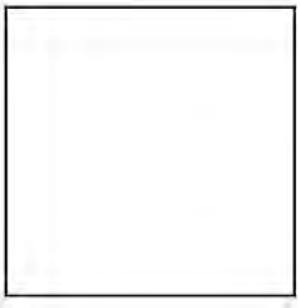
AREA = ?

05D-10 = _____

05G-10.

SQUARE

Perimeter = 0.094

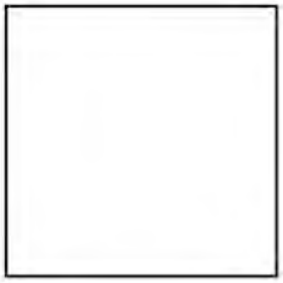


AREA = ?

05G-10 = _____

07I-9.

SQUARE



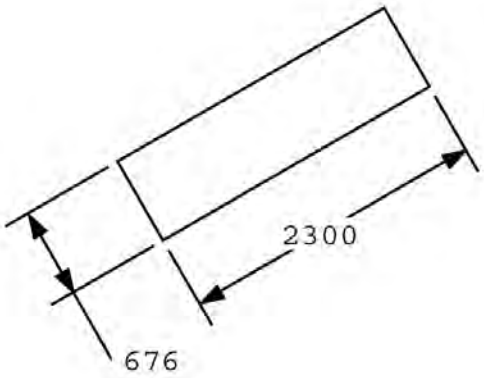
Perimeter = 0.465

Area = ?

07I-9 = _____

05B-9.

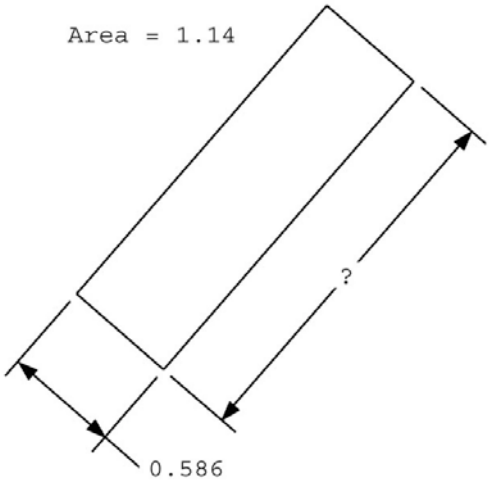
RECTANGLE



AREA = ?

05B-9 = _____

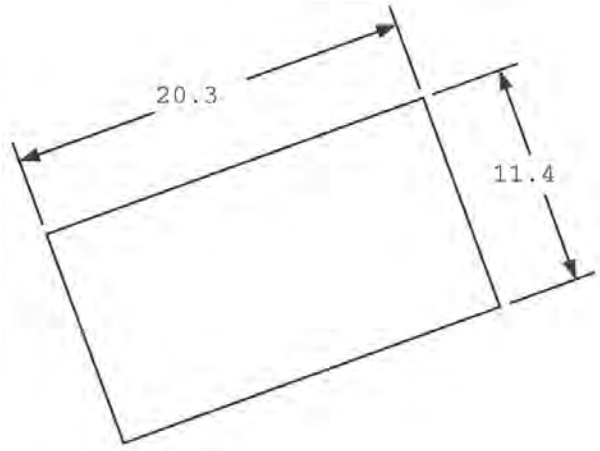
05I-9. RECTANGLE



05I-9 = _____

06C-10.

RECTANGLE

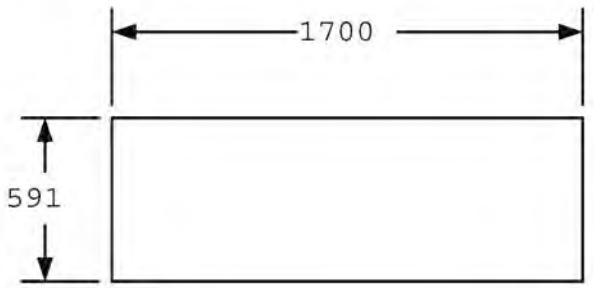


Area = ?

06C-10 = _____

07C-9.

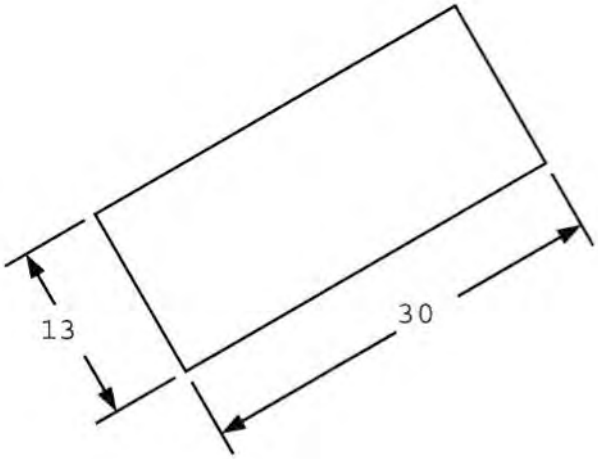
RECTANGLE



Area = ?

07C-9 = _____

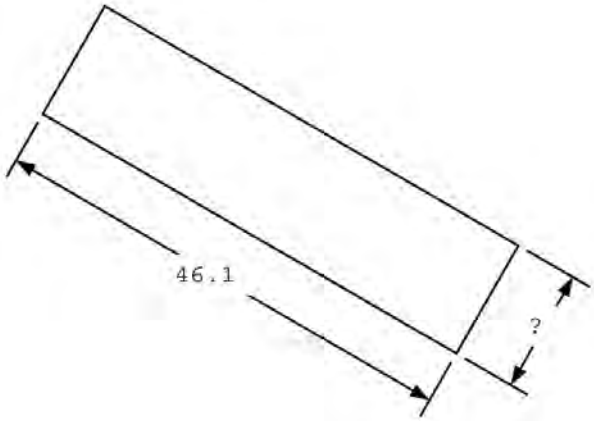
07H-9. RECTANGLE



Area = ?

07H-9 = _____

08A-9. RECTANGLE

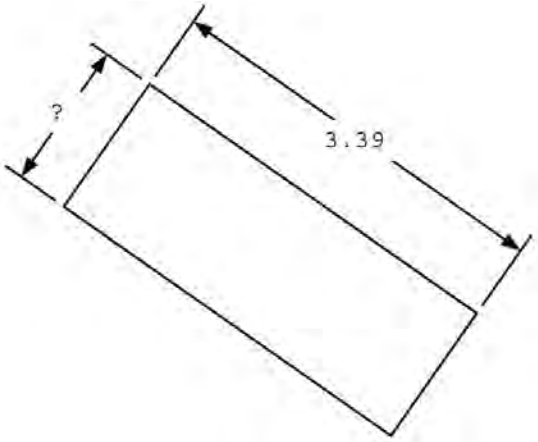


AREA = 550

08A-9 = _____

09H-10.

RECTANGLE

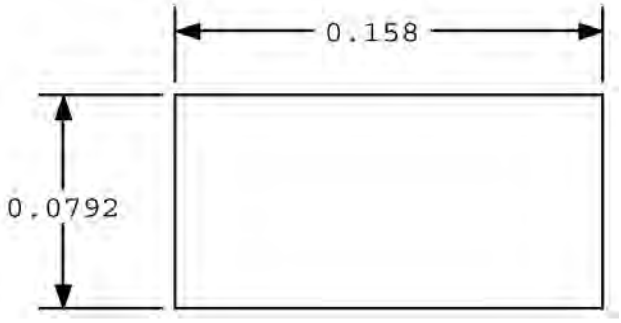


Area = 4.29

09H-10 = _____

05E-10.

RECTANGLE

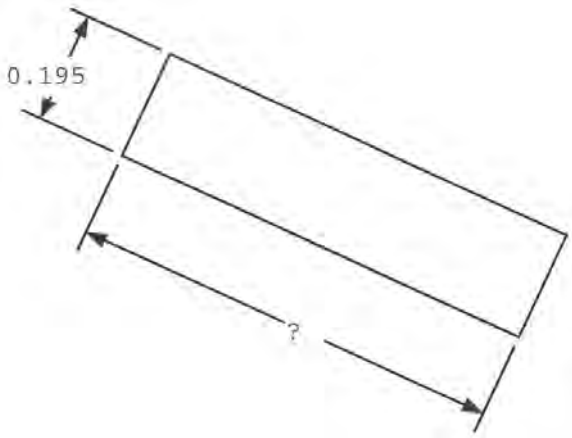


Perimeter = ?

05E-10 = _____

06D-9.

RECTANGLE

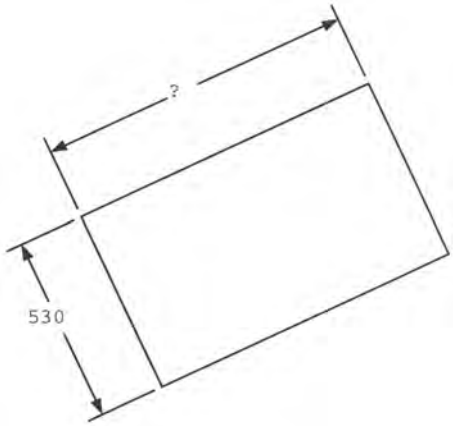


Perimeter = 1.89

06D-9 = _____

06E-10.

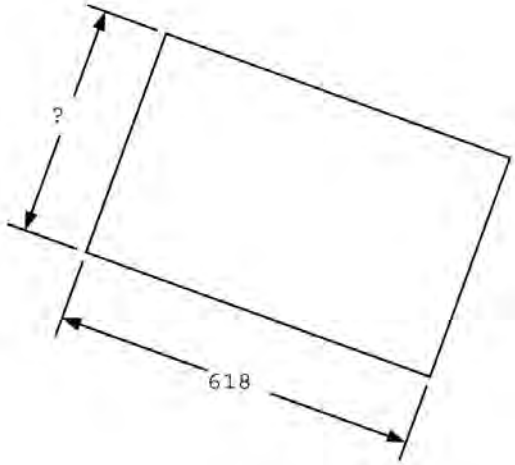
RECTANGLE



Perimeter = 2830

06E-10 = _____

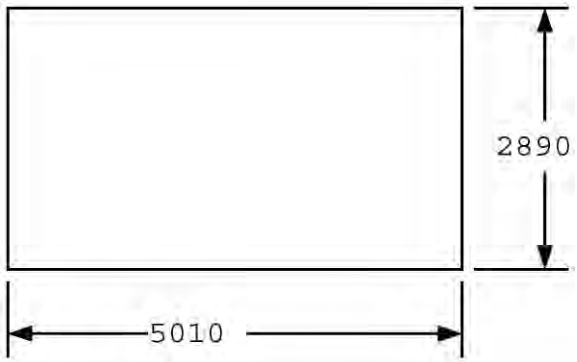
08H-10. RECTANGLE



PERIMETER = 2030

08H-10 = _____

09F-10. RECTANGLE

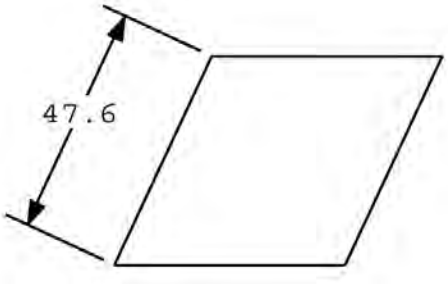


Perimeter = ?

09F-10 = _____

05H-9.

RHOMBUS

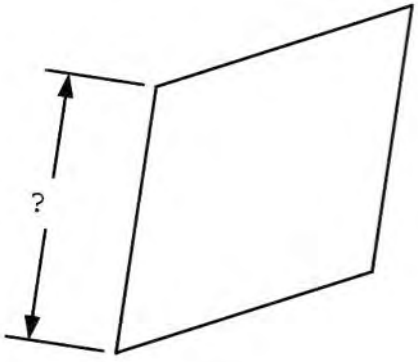


Perimeter = ?

05H-9 = _____

07B-10.

RHOMBUS

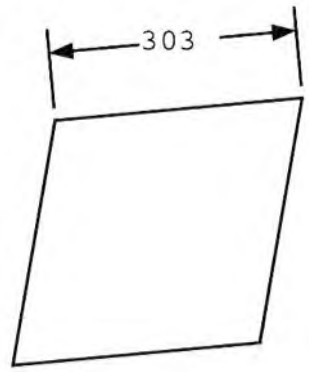


Perimeter = 0.923

07B-10 = _____

07H-10.

RHOMBUS

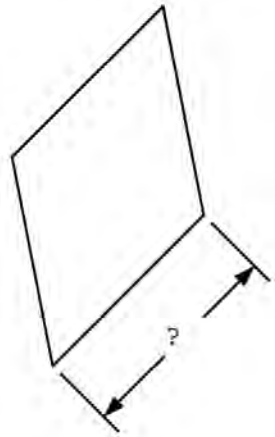


Perimeter = ?

07H-10 = _____

08B-10.

RHOMBUS

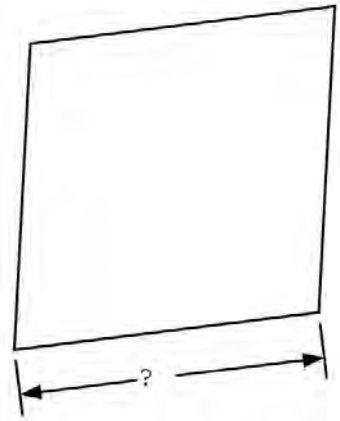


PERIMETER = 533

08B-10 = _____

08G-10.

RHOMBUS

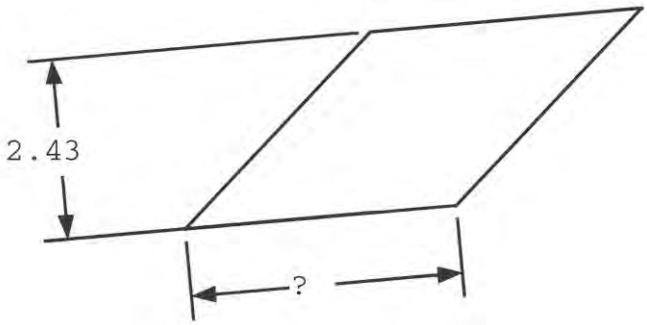


PERIMETER = 684

08G-10 = _____

06B-9.

RHOMBUS

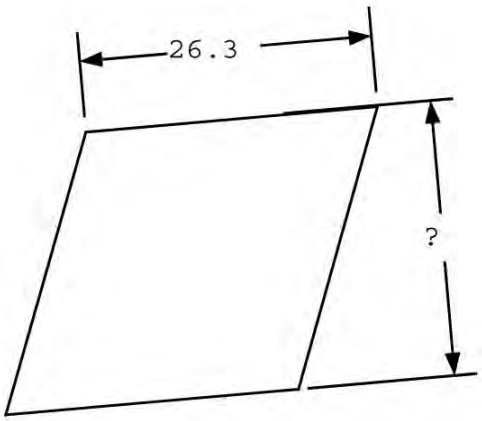


Area = 8.81

06B-9 = _____

09B-10.

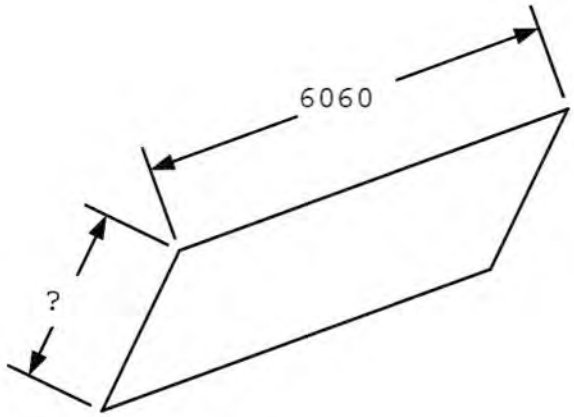
RHOMBUS



Area = 653

09B-10 = _____

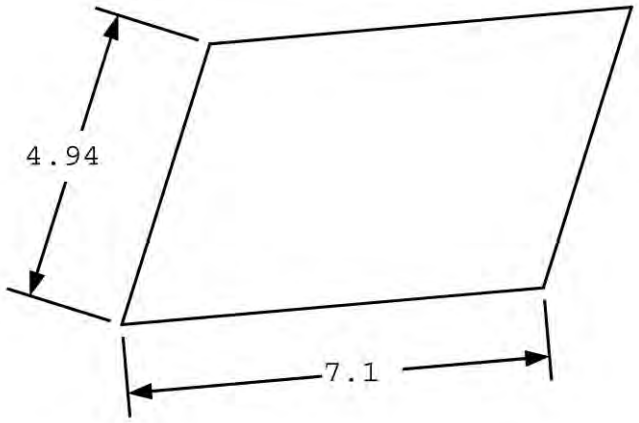
07E-9. PARALLELOGRAM



Perimeter = 17,340

07E-9 = _____

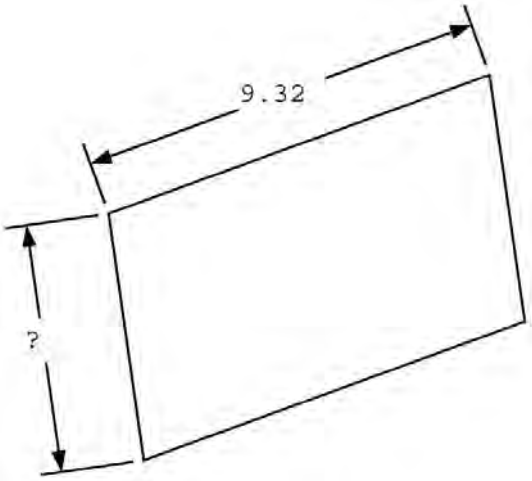
08I-10. PARALLELOGRAM



PERIMETER = ?

08I-10 = _____

09G-9. PARALLELOGRAM

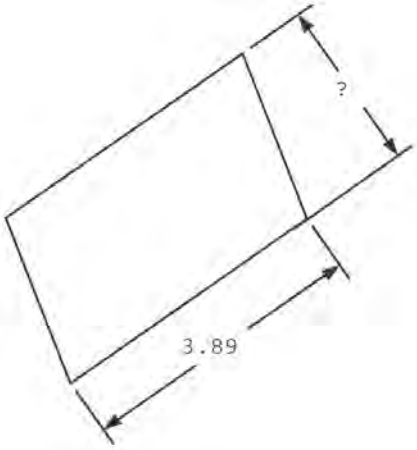


Perimeter = 30

09G-9 = _____

06F-10.

PARALLELOGRAM

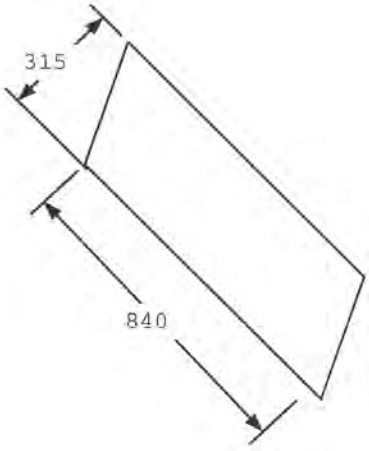


Area = 9.1

06F-10 = _____

06G-10.

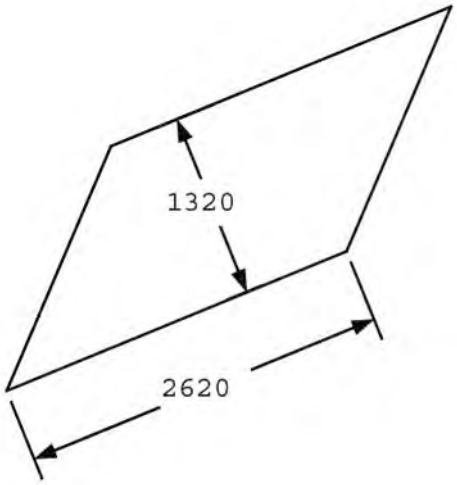
PARALLELOGRAM



Area = ?

06G-10 = _____

07A-10. PARALLELOGRAM

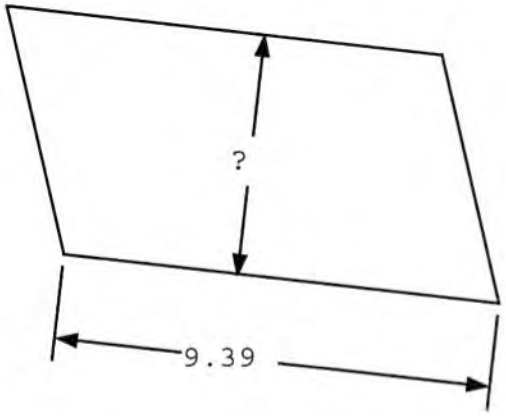


Area = ?

07A-10 =

07F-10.

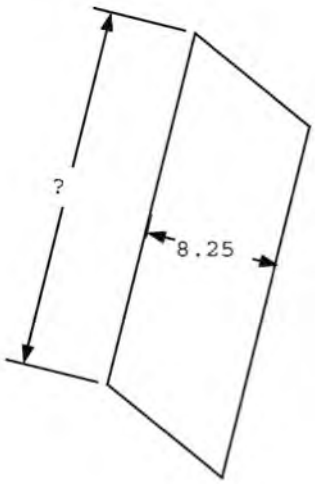
PARALLELOGRAM



Area = 49.5

07F-10 = _____

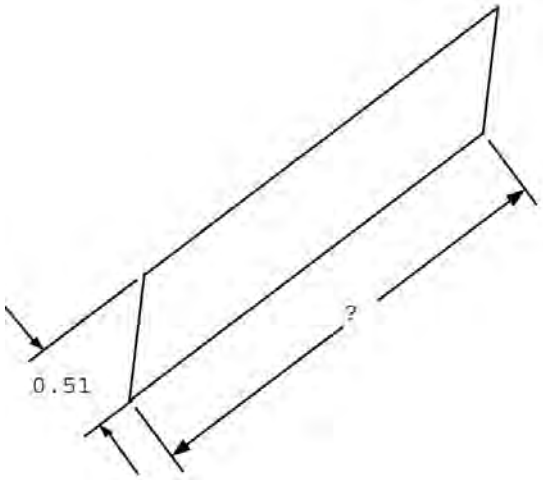
07G-10. PARALLELOGRAM



Area = 1 81

07G-10 = _____

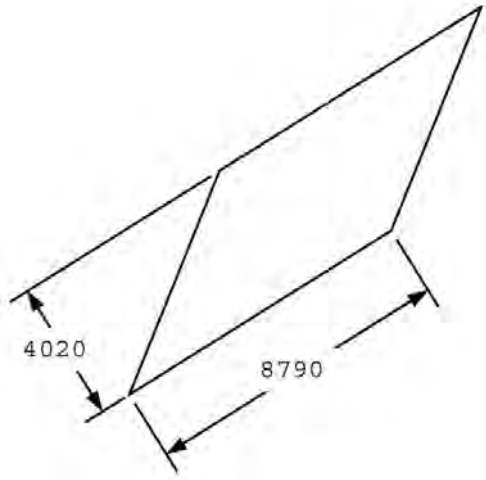
08C-9. PARALLELOGRAM



AREA = 1.25

08C-9 = _____

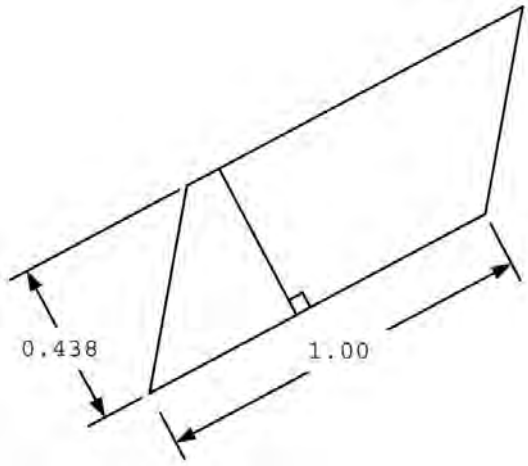
08E-9. PARALLELOGRAM



AREA = ?

08E-9 = _____

09F-9. PARALLELOGRAM

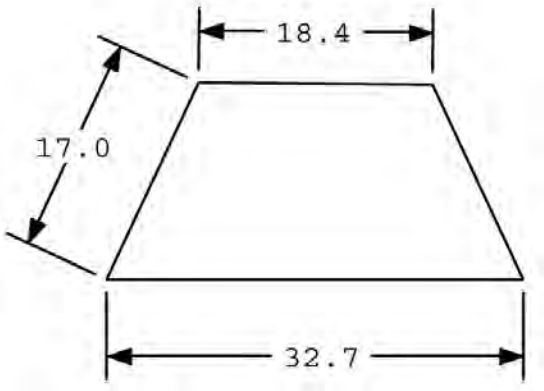


Area = ?

09F-9 = _____

05G-9.

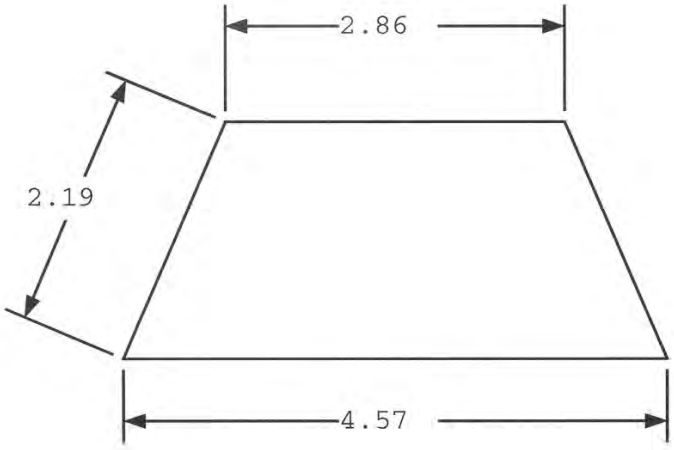
ISOSCELES TRAPEZOID



Perimeter = ?

05G-9 = _____

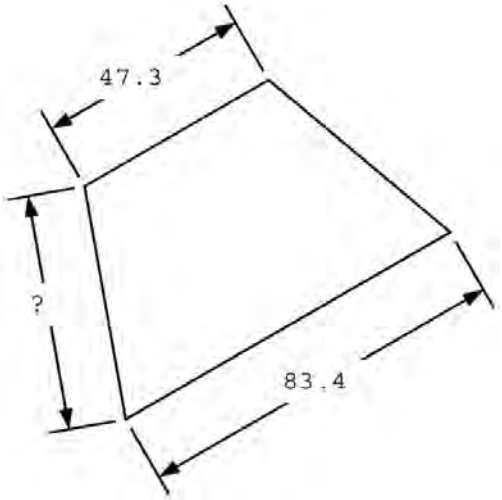
06A-9. ISOSCELES TRAPEZOID



Perimeter = ?

06A-9 = _____

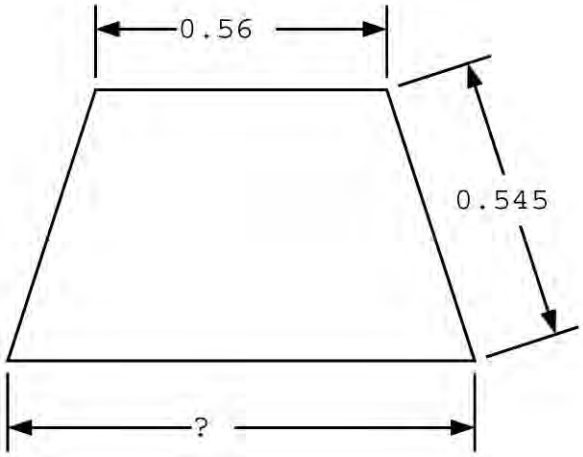
09A-10. ISOSCELES TRAPEZOID



Perimeter = 237

09A-10 = _____

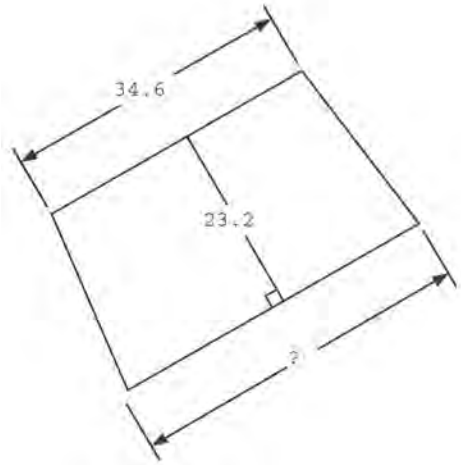
09E-10. ISOSCELES TRAPEZOID



Perimeter = 2.55

09E-10 = _____

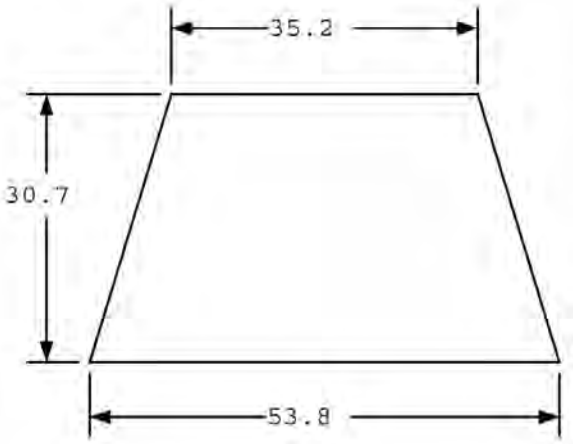
06I-10. ISOSCELES TRAPEZOID



Area = 967

06I-10 = _____

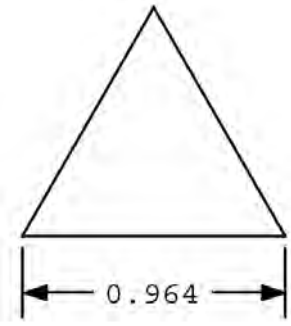
08D-9. ISOSCELES TRAPEZOID



AREA = ?

08D-9 = _____

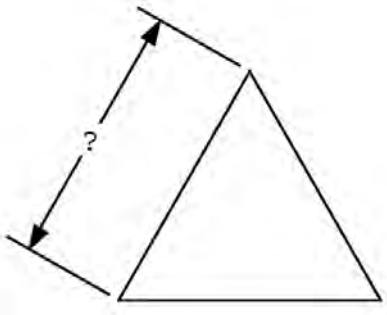
05A-10.
EQUILATERAL TRIANGLE



AREA = ?

05A-10 = _____

05C-9.
EQUILATERAL TRIANGLE

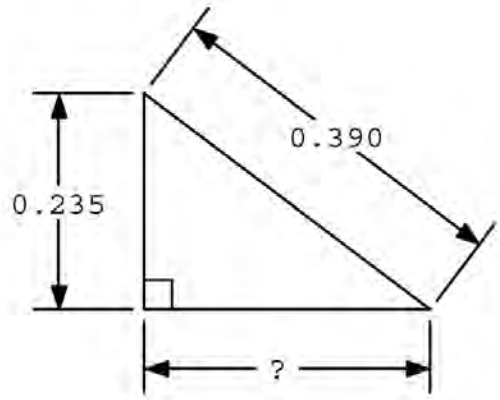


AREA = 8.39

05C-9 = _____

05A-19.

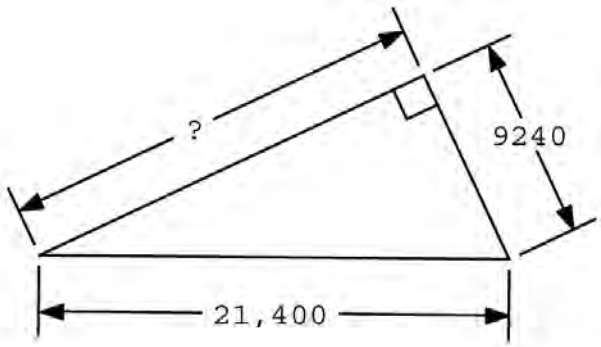
RIGHT TRIANGLE



05A-19 = _____

05C-20.

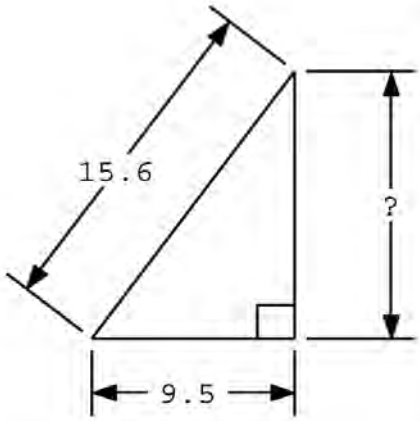
RIGHT TRIANGLE



05C-20 = _____

05F-19.

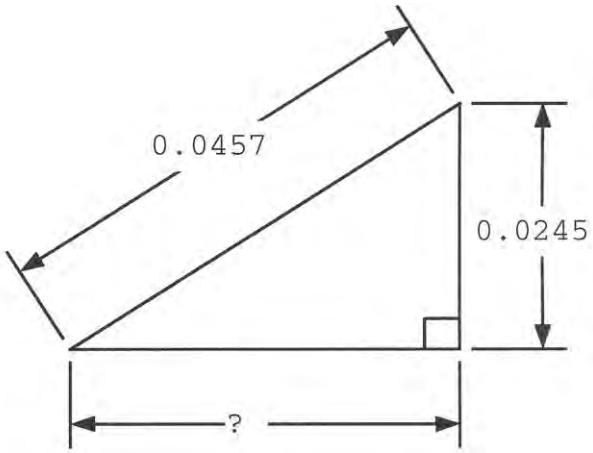
RIGHT TRIANGLE



05F-19 = _____

06D-20.

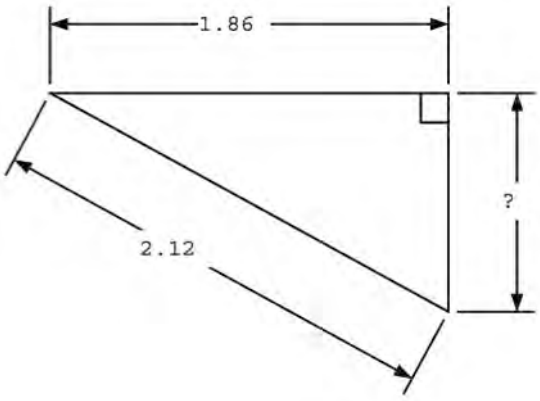
RIGHT TRIANGLE



06D-20 = _____

07C-20.

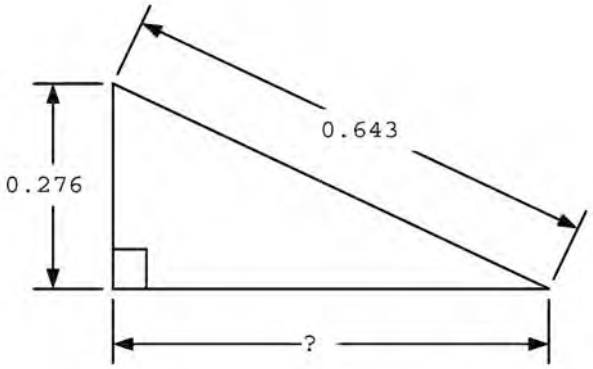
RIGHT TRIANGLE



07C-20 = _____

07G-19.

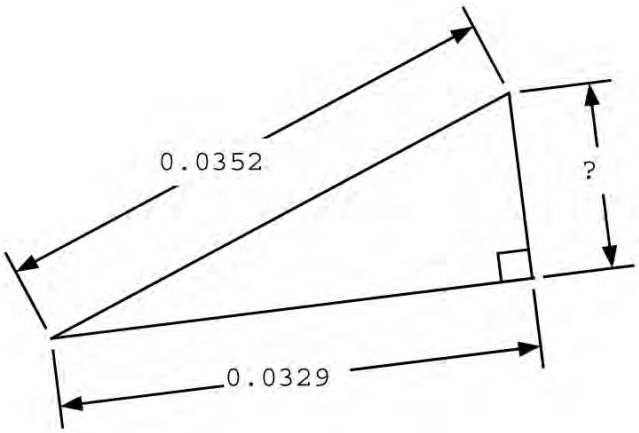
RIGHT TRIANGLE



07G-19 = _____

08B-20.

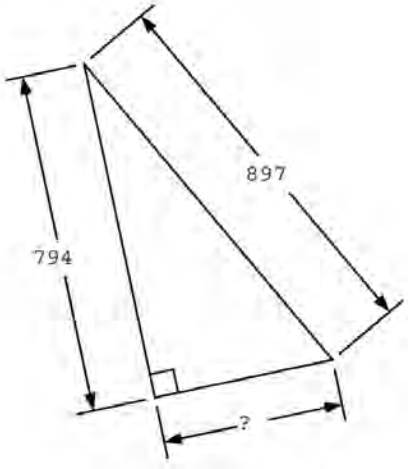
RIGHT TRIANGLE



08B-20 = _____

08C-20.

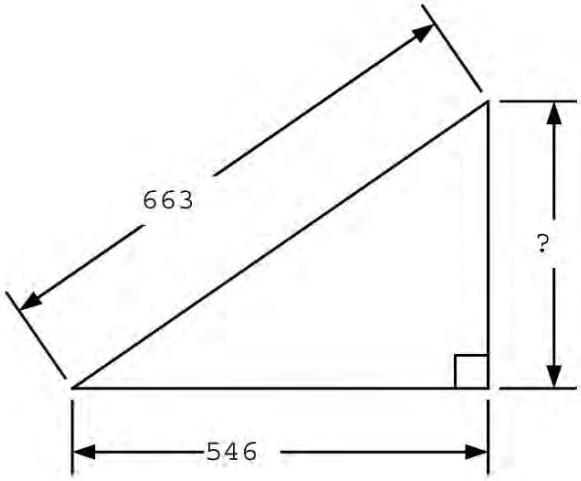
RIGHT TRIANGLE



08C-20 = _____

09E-19.

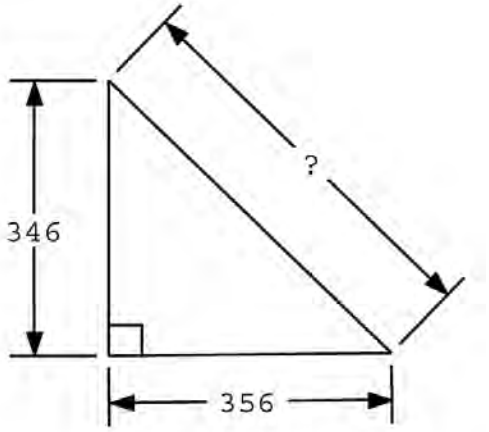
RIGHT TRIANGLE



09E-19 = _____

05E-20.

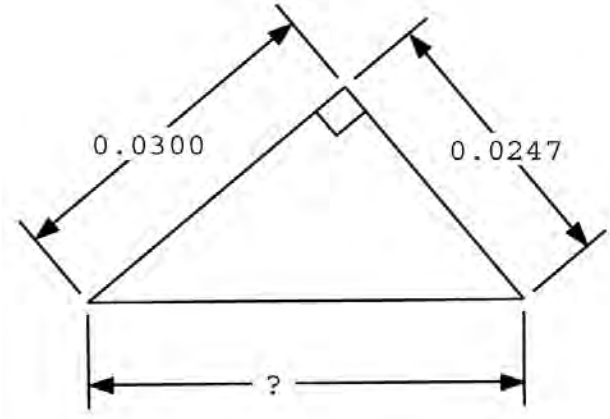
RIGHT TRIANGLE



05E-20 = _____

05I-19.

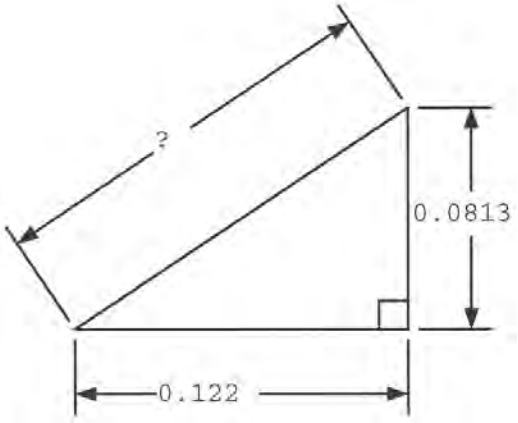
RIGHT TRIANGLE



05I-19 = _____

06E-19.

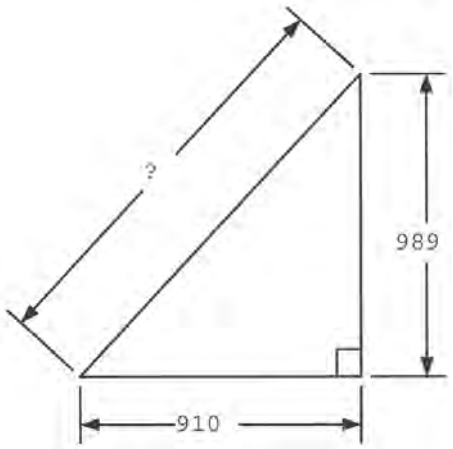
RIGHT TRIANGLE



06E-19 = _____

06I-19.

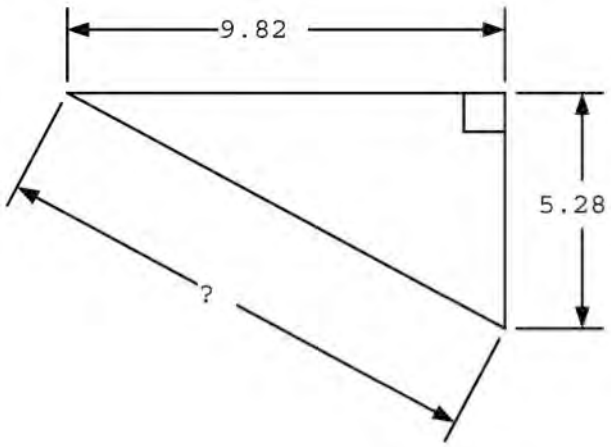
RIGHT TRIANGLE



06I-19 = _____

07E-19.

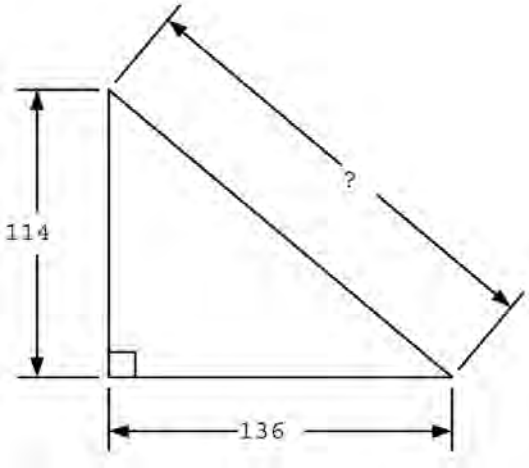
RIGHT TRIANGLE



07E-19 = _____

08G-20.

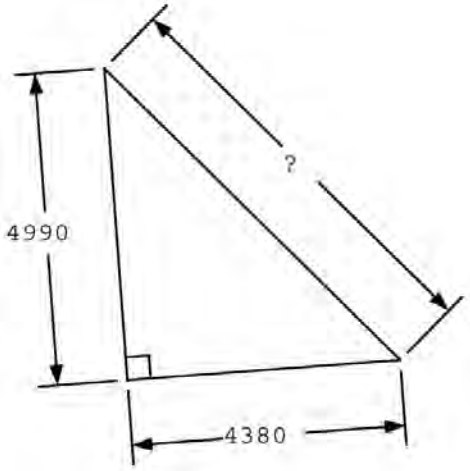
RIGHT TRIANGLE



08G-20 = _____

09A-20.

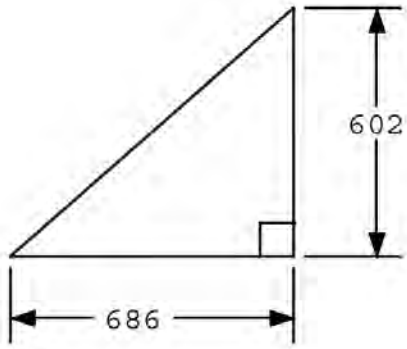
RIGHT TRIANGLE



09A-20 = _____

05C-19.

RIGHT TRIANGLE

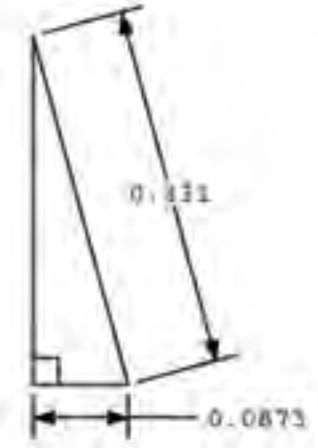


AREA = ?

05C-19 = _____

05D-20.

RIGHT TRIANGLE

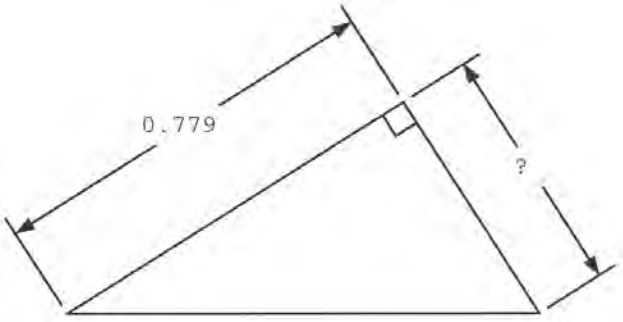


AREA = ?

05D-20 = _____

06C-20.

RIGHT TRIANGLE



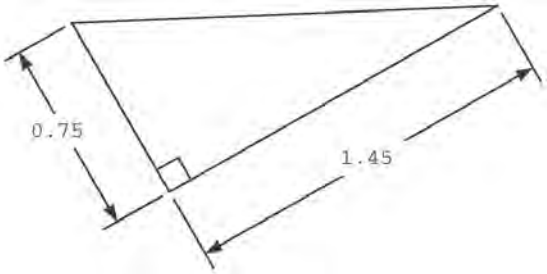
Area = 0.192

06C-20 = _____

06F-20.

RIGHT TRIANGLE

Area = ?

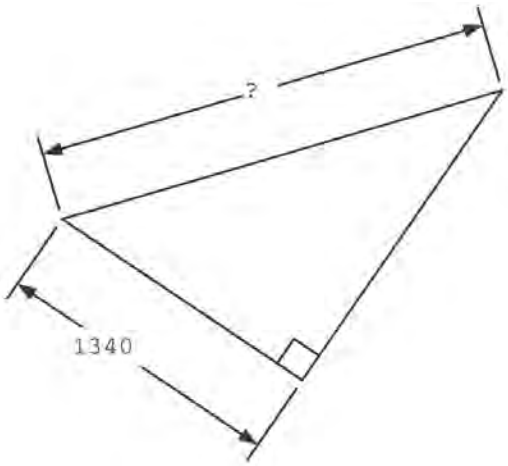


06F-20 = _____

06H-20.

RIGHT TRIANGLE

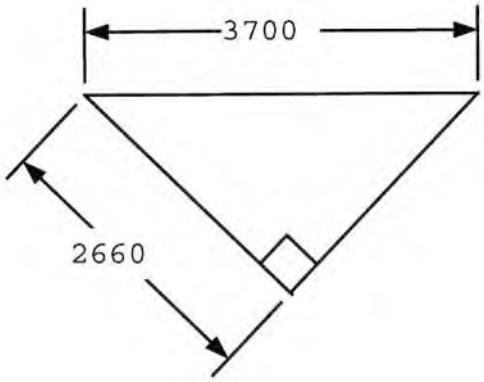
Area = 1,100,000



06H-20 = _____

07B-19.

RIGHT TRIANGLE

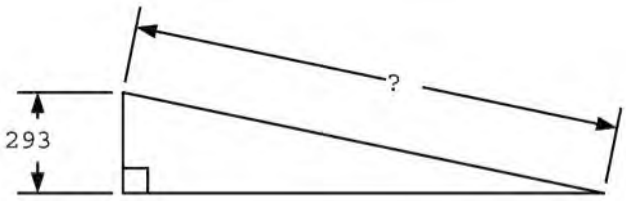


Area = ?

07B-19 = _____

07I-20.

RIGHT TRIANGLE

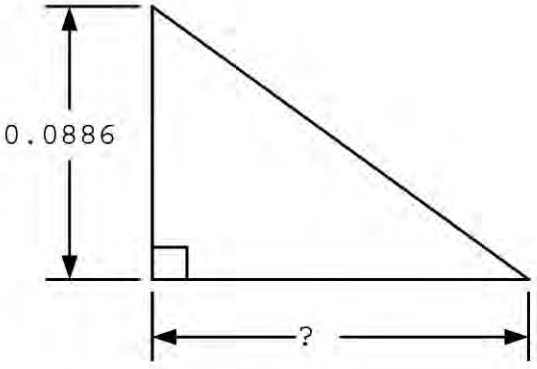


Area = 209,000

07I-20 = _____

08A-20.

RIGHT TRIANGLE

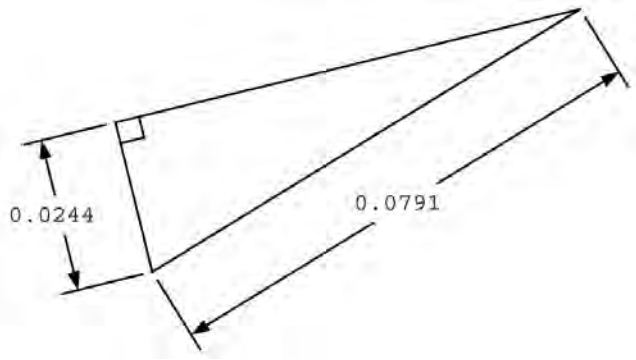


AREA = 0.00542

08A-20 = _____

08D-20.

RIGHT TRIANGLE

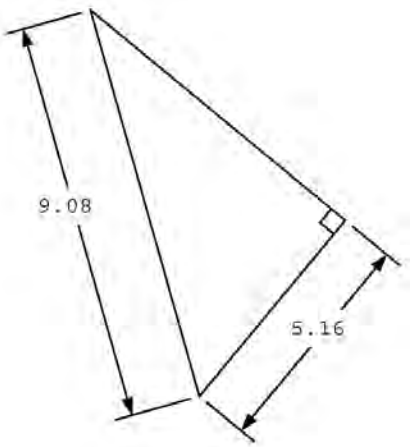


AREA = ?

08D-20 = _____

09A-19.

RIGHT TRIANGLE

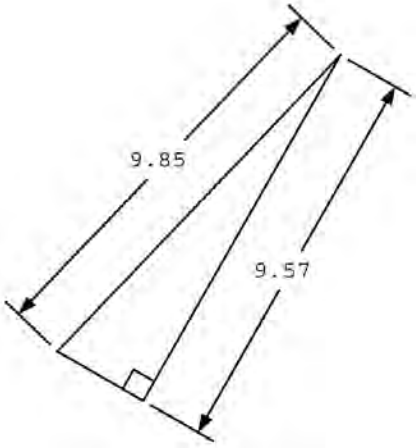


Area = ?

09A-19 = _____

09G-20.

RIGHT TRIANGLE

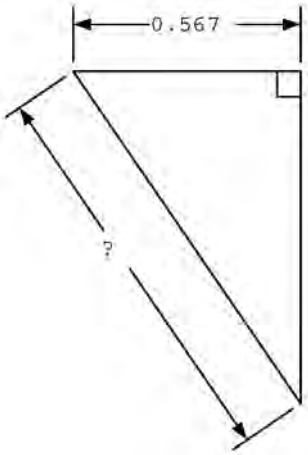


Area = ?

09G-20 = _____

09H-19.

RIGHT TRIANGLE

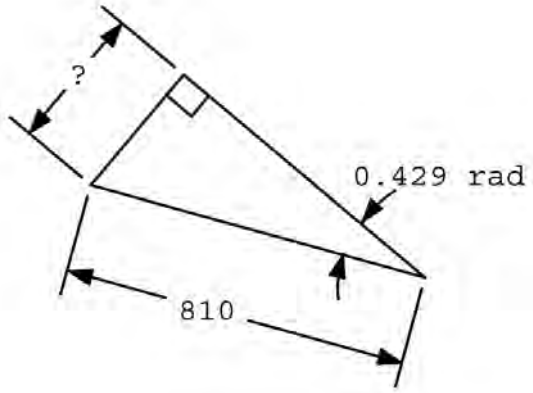


Area = 0.236

09H-19 = _____

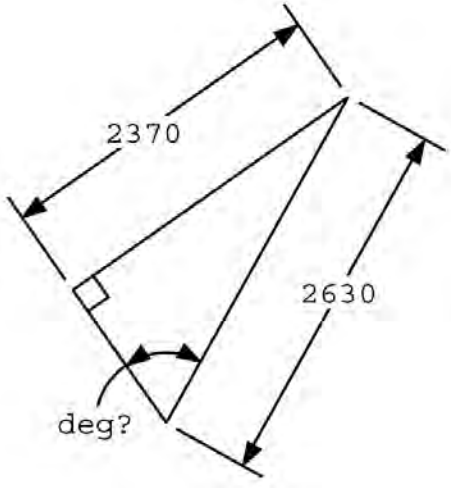
05A-20.

RIGHT TRIANGLE



05A-20 = _____

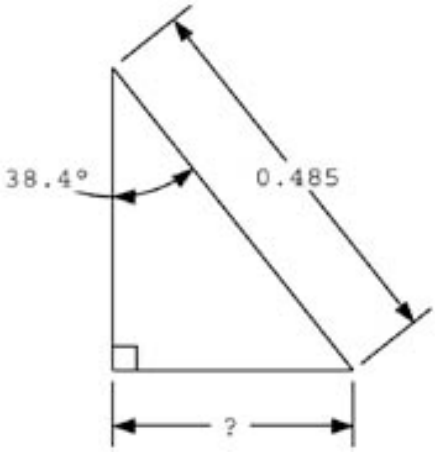
05E-19. RIGHT TRIANGLE



05E-19 = _____

05H-19.

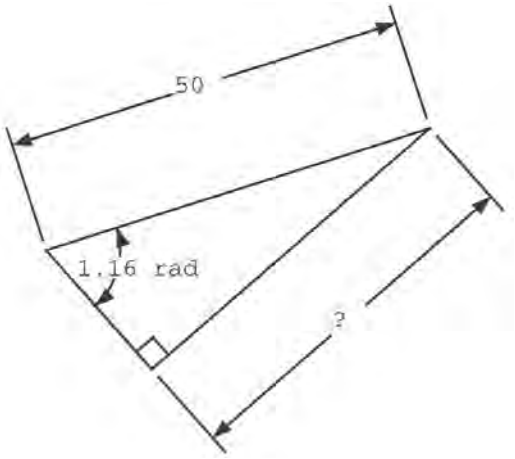
RIGHT TRIANGLE



05H-19 = _____

06B-19.

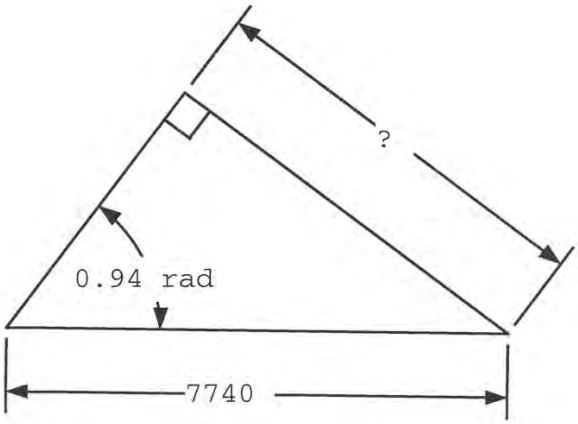
RIGHT TRIANGLE



06B-19 = _____

06E-20.

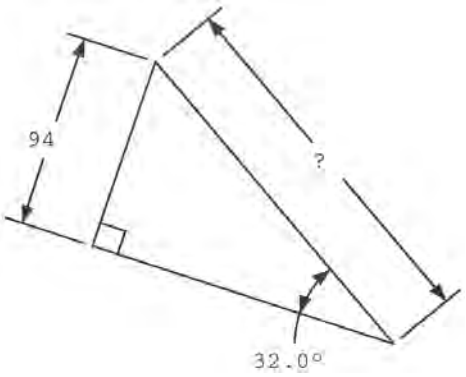
RIGHT TRIANGLE



06E-20 = _____

06G-19.

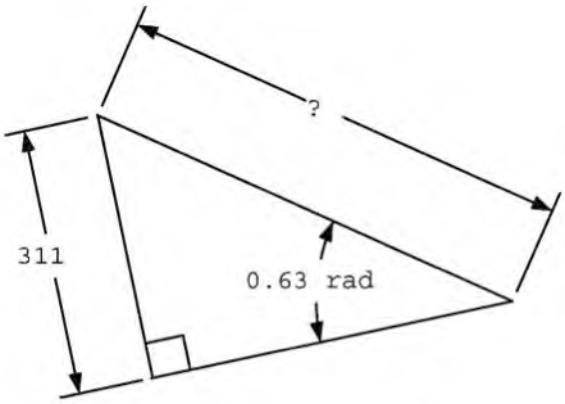
RIGHT TRIANGLE



06G-19 = _____

07B-20.

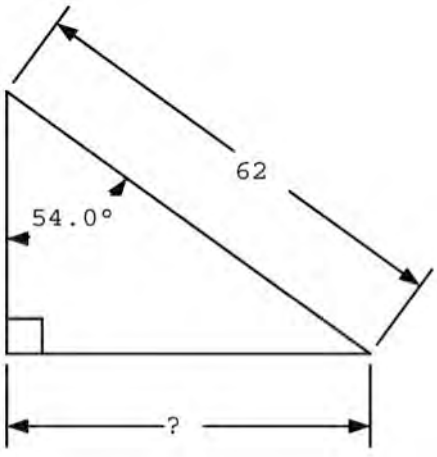
RIGHT TRIANGLE



07B-20 = _____

07E-20.

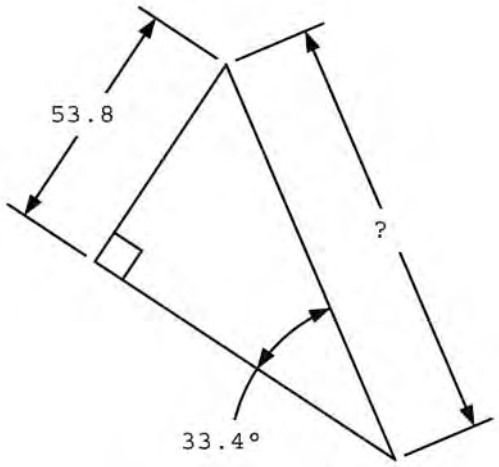
RIGHT TRIANGLE



07E-20 = _____

07F-19.

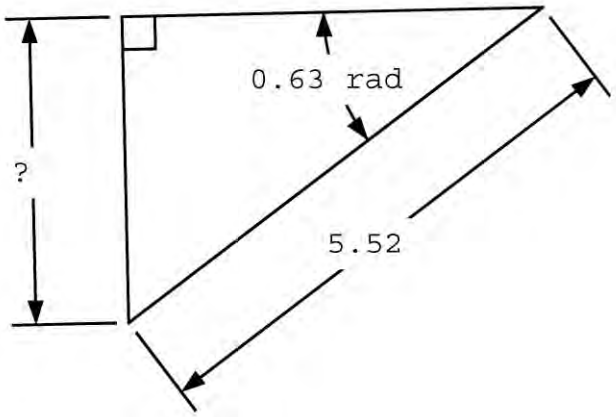
RIGHT



TR IANGLE

08C-19.

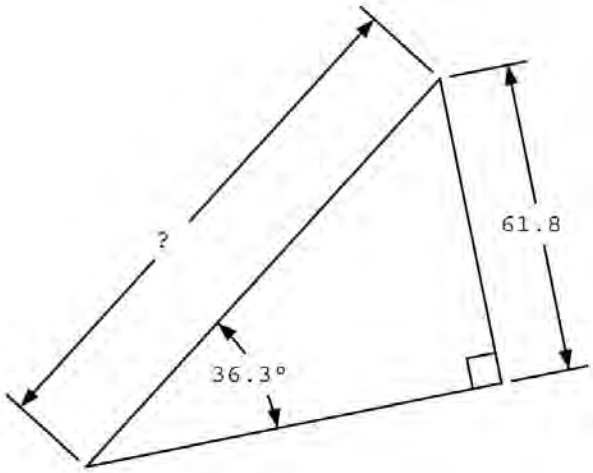
RIGHT TRIANGLE



08C-19 = _____

08F-20.

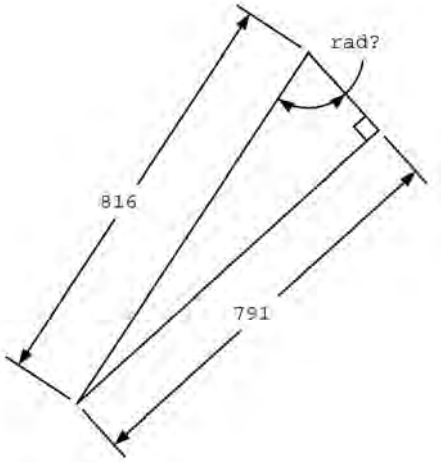
RIGHT TRIANGLE



08F-20 = _____

08I-19.

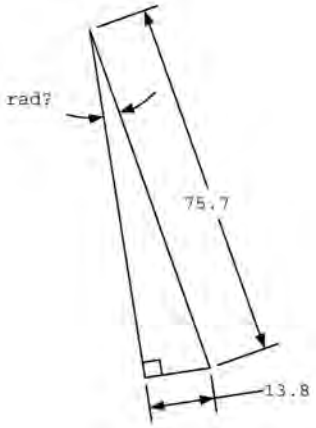
RIGHT TRIANGLE



08I-19 = _____

09B-19.

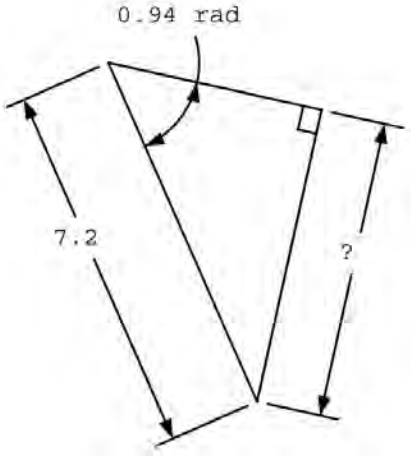
RIGHT TRIANGLE



09B-19 = _____

09F-19.

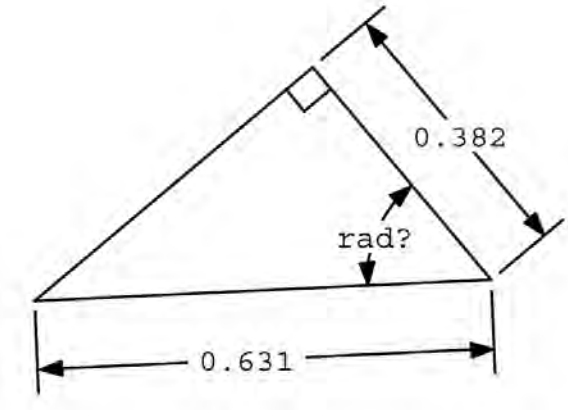
RIGHT TRIANGLE



09F-19 = _____

05D-19.

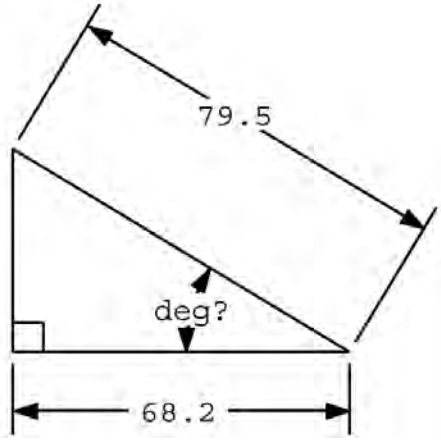
RIGHT TRIANGLE



05D-19 = _____

05G-19.

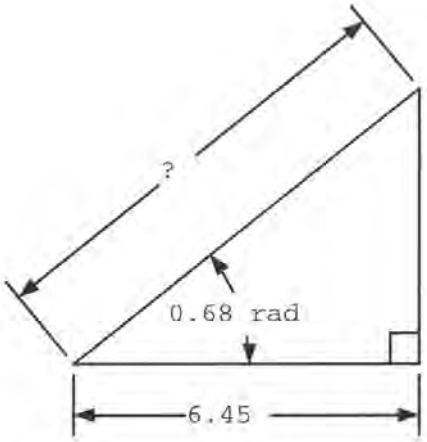
RIGHT TRIANGLE



05G-19 = _____

06A-20.

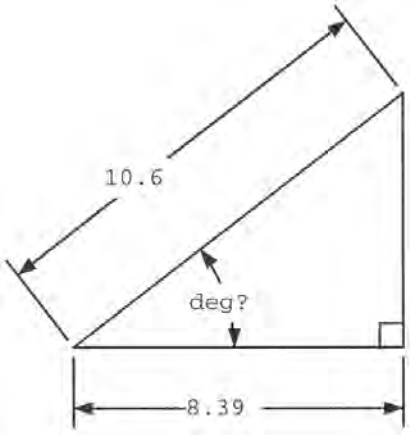
RIGHT TRIANGLE



06A-20 = _____

06C-19.

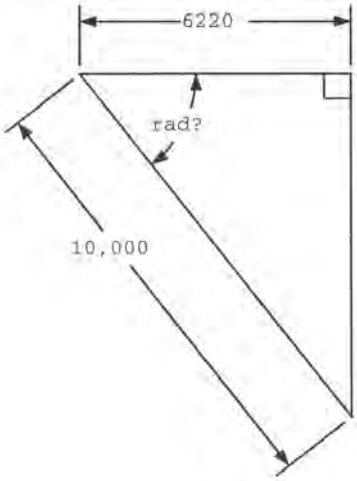
RIGHT TRIANGLE



06C-19 = _____

06F-19.

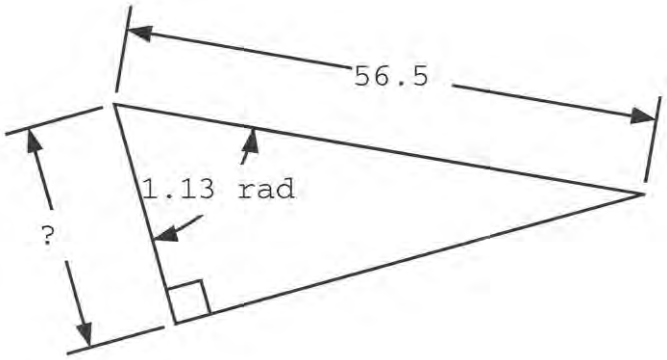
RIGHT TRIANGLE



06F-19 = _____

06H-19.

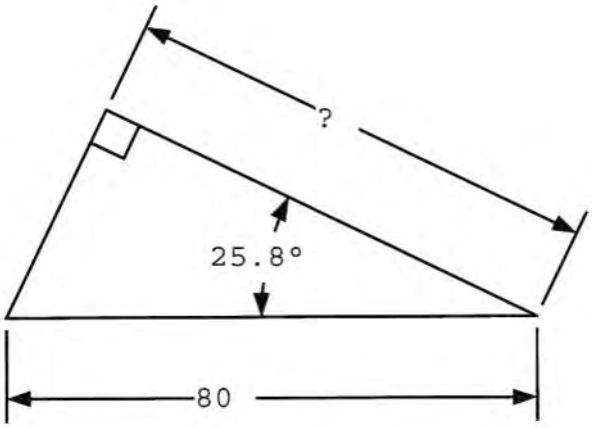
RIGHT TRIANGLE



06H-19 = _____

07G-20.

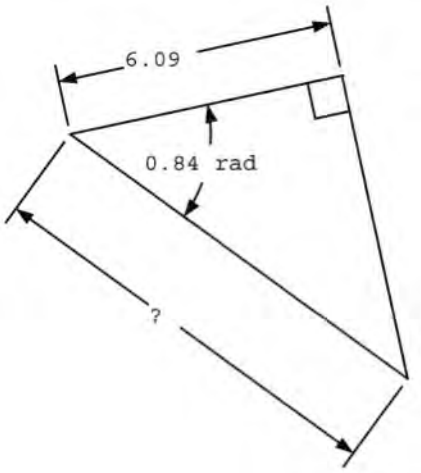
RIGHT TRIANGLE



07G-20 = _____

07I-19.

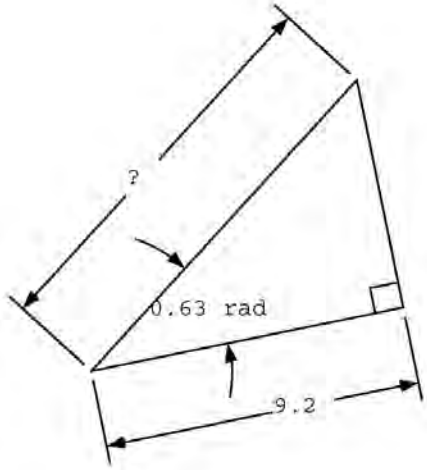
RIGHT TRIANGLE



07I-19 = _____

08D-19.

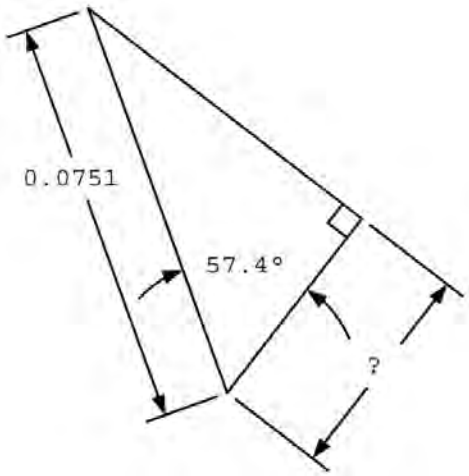
RIGHT TRIANGLE



08D-19 = _____

09G-19.

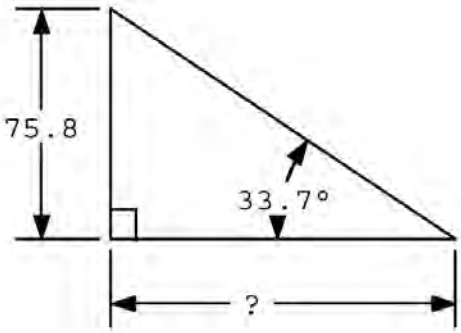
RIGHT TRIANGLE



09G-19 = _____

05B-20.

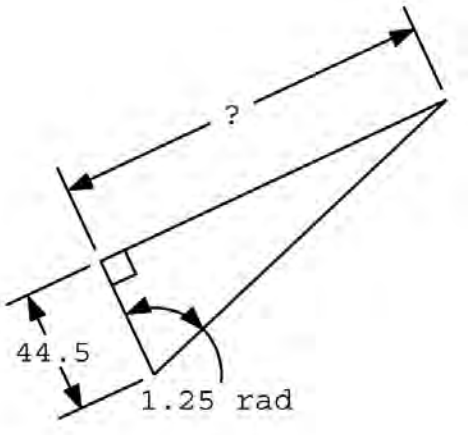
RIGHT TRIANGLE



05B-20 = _____

05G-20.

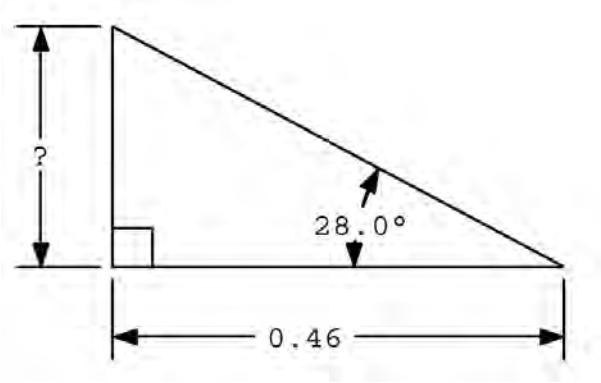
RIGHT TRIANGLE



05G-20 = _____

05I-20.

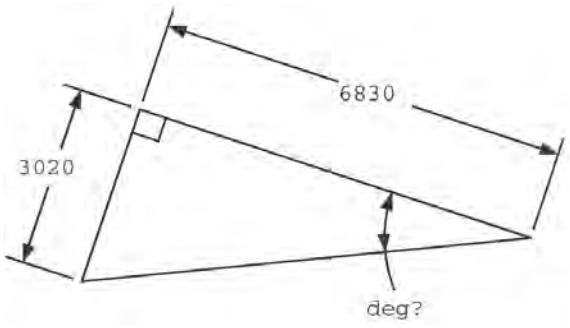
RIGHT TRIANGLE



05I-20 = _____

06B-20.

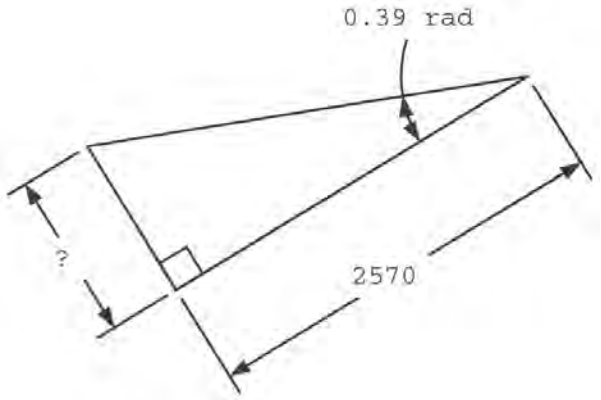
RIGHT TRIANGLE



06B-20 = _____

06D-19.

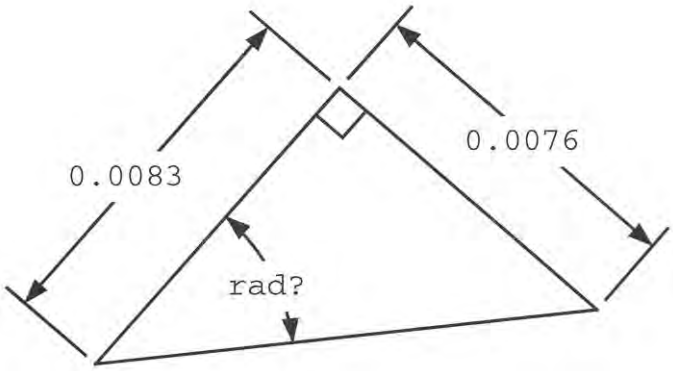
RIGHT TRIANGLE



06D-19 = _____

06G-20.

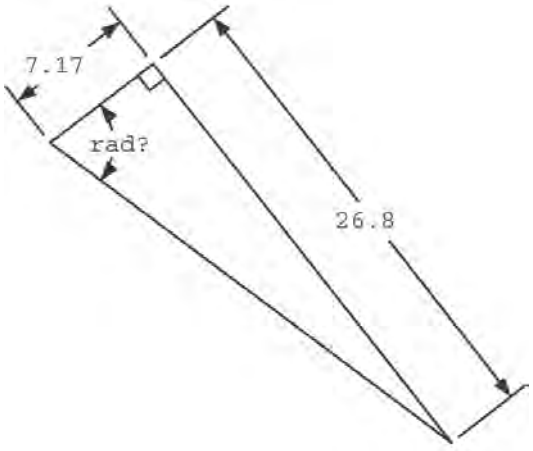
RIGHT TRIANGLE



06G-20 = _____

06I-20.

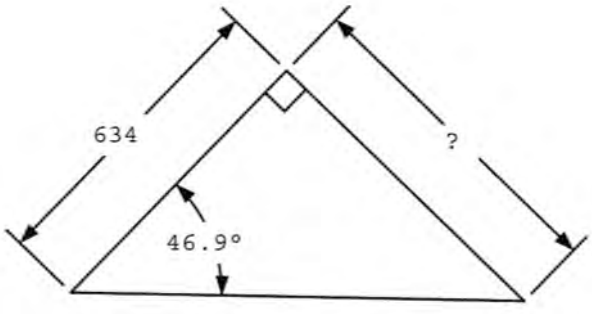
RIGHT TRIANGLE



06I-20 = _____

07A-19.

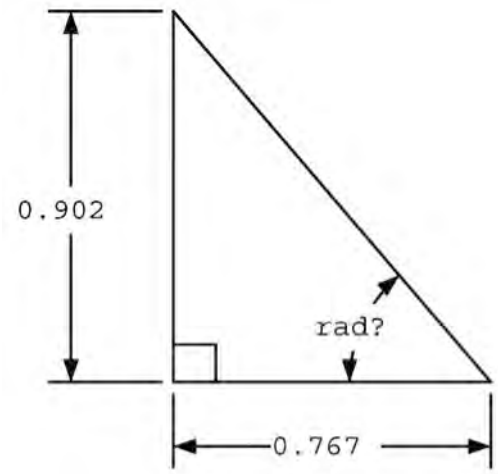
RIGHT TRIANGLE



07A-19 = _____

07H-19.

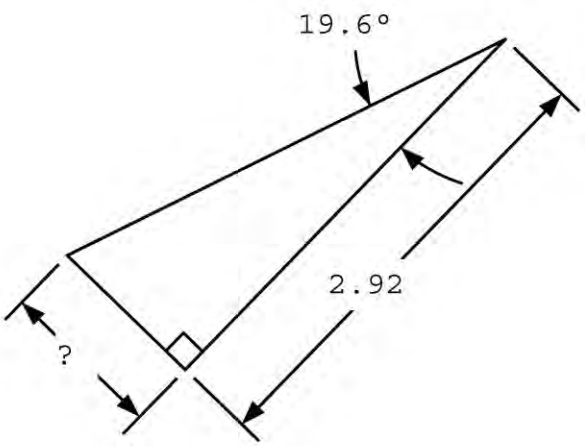
RIGHT TRIANGLE



07H-19 = _____

08A-19.

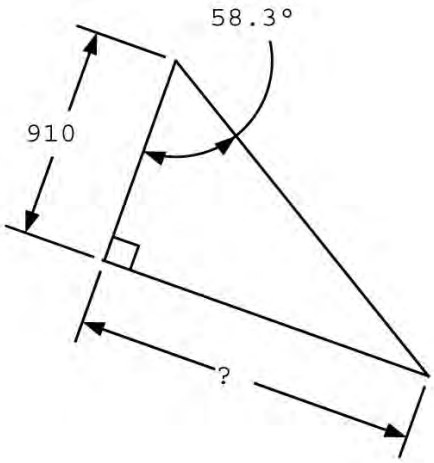
RIGHT TRIANGLE



08A-19 = _____

08E-19.

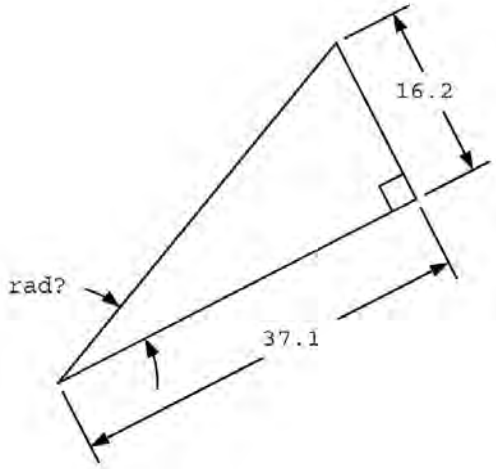
RIGHT TRIANGLE



08E-19 = _____

08E-20.

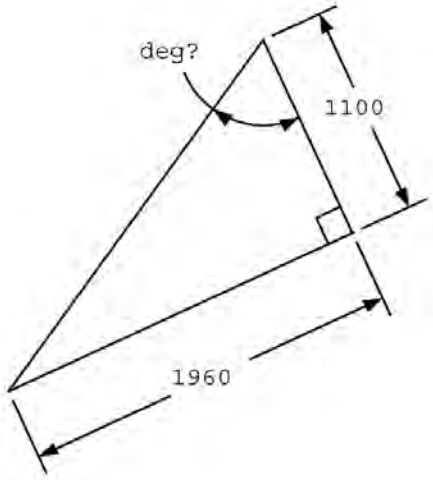
RIGHT TRIANGLE



08E-20 = _____

08G-19.

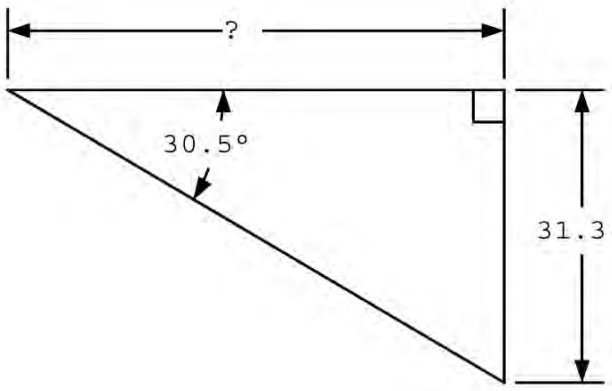
RIGHT TRIANGLE



08G-19 = _____

08H-20.

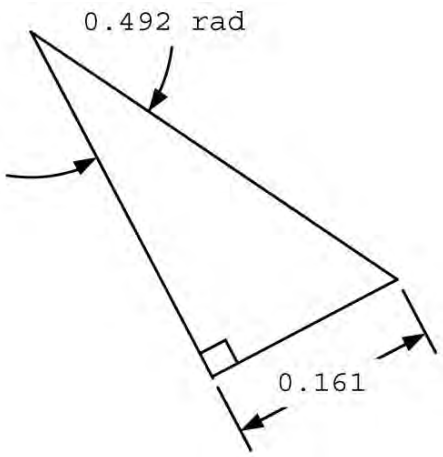
RIGHT TRIANGLE



08H-20 = _____

09H-20.

RIGHT TRIANGLE

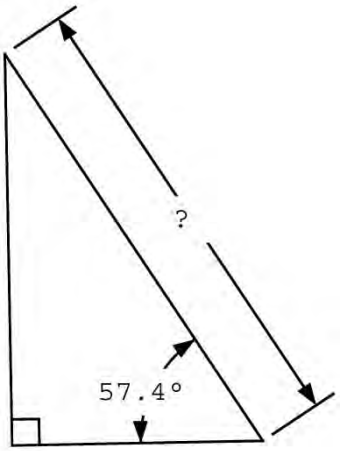


Perimeter = ?

09H-20 = _____

09I-19.

RIGHT TRIANGLE

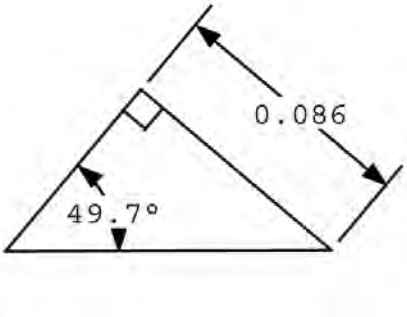


Perimeter = 2680

09I-19 = _____

05B-19.

RIGHT TRIANGLE

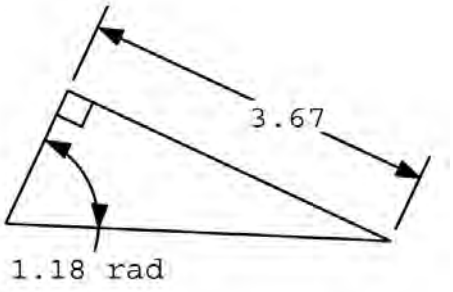


AREA = ?

05B-19 = _____

05F-20.

RIGHT TRIANGLE

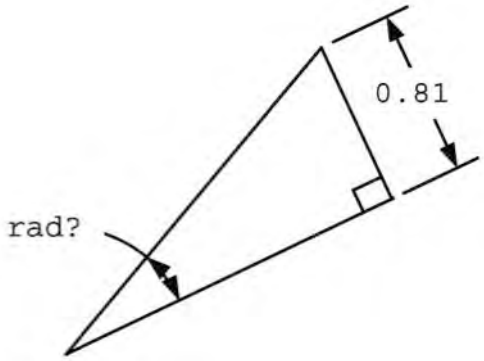


AREA = ?

05F-20 = _____

07A-20.

RIGHT TRIANGLE

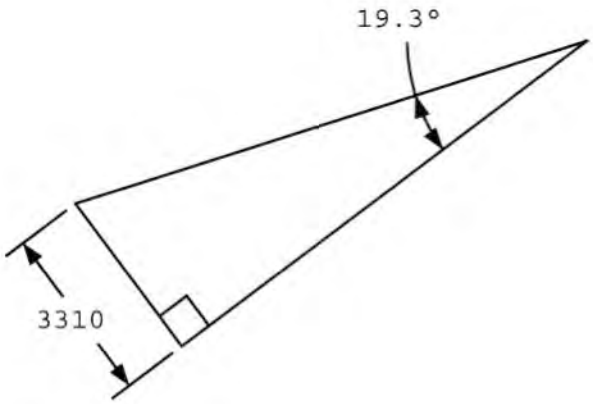


Area = 0.903

07A-20 = _____

07H-20.

RIGHT TRIANGLE

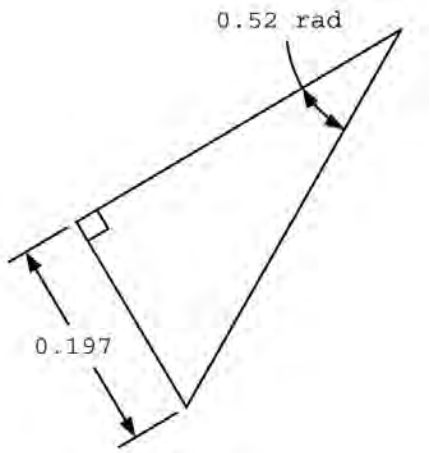


Area =?

07H-20 = _____

08H-19.

RIGHT TRIANGLE

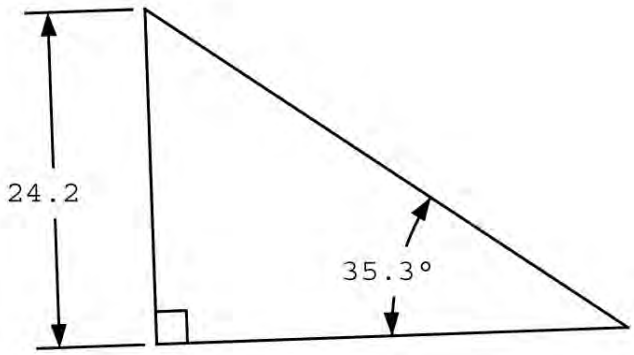


AREA = ?

08H-19 = _____

08I-20.

RIGHT TRIANGLE

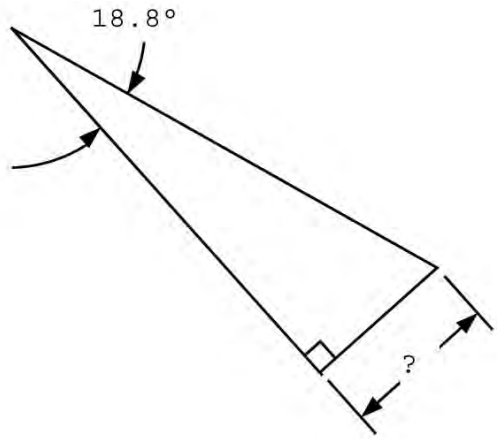


AREA = ?

08I-20 = _____

09E-20.

RIGHT TRIANGLE

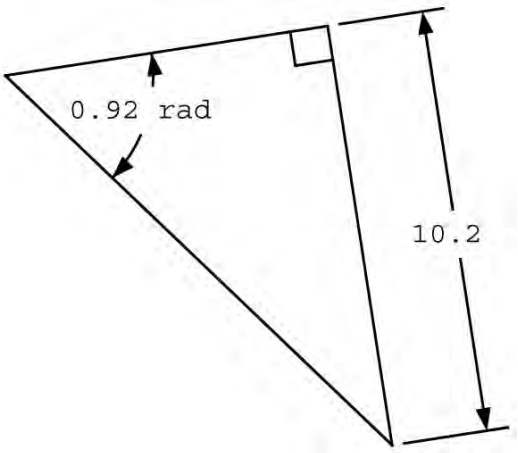


Area = 17.6

09E-20 = _____

09I-20.

RIGHT TRIANGLE

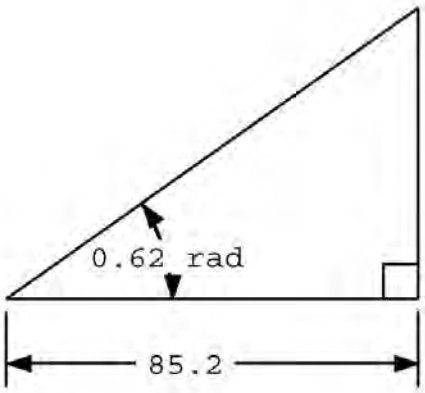


Area = ?

09I-20 = _____

05H-20.

RIGHT TRIANGLE

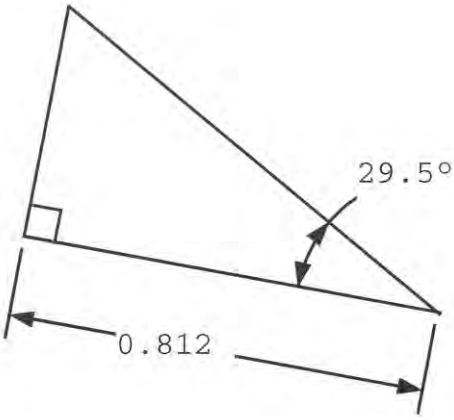


AREA = ?

05H-20 = _____

06A-19.

RIGHT TRIANGLE

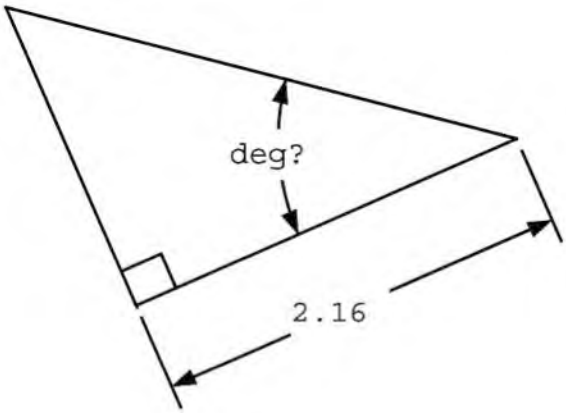


Area = ?

06A-19 = _____

07D-20.

RIGHT TRIANGLE

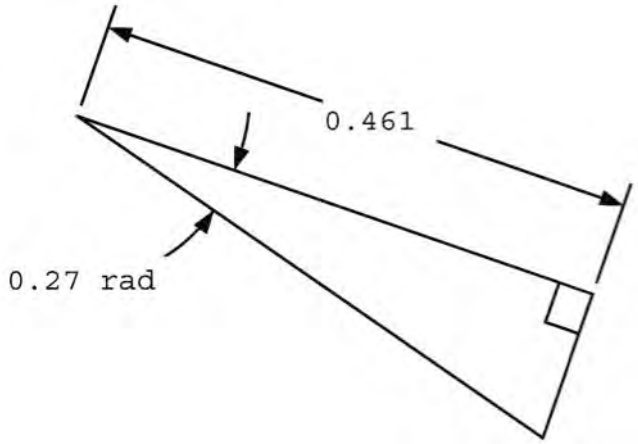


Area = 1.82

07D-20 = _____

07F-20.

RIGHT TRIANGLE

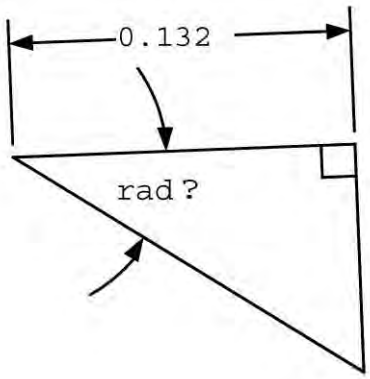


Area = ?

07F-20 = _____

08B-19.

RIGHT TRIANGLE

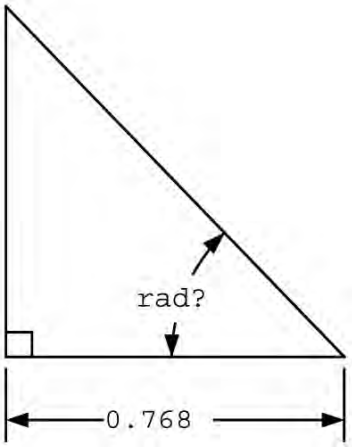


AREA = 0.00586

08B-19 = _____

08F-19.

RIGHT TRIANGLE

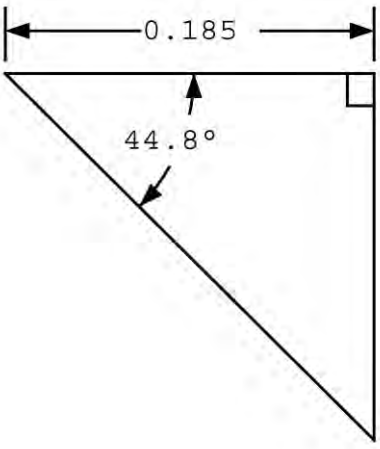


AREA = 0.306

08F-19 = _____

09B-20.

RIGHT TRIANGLE

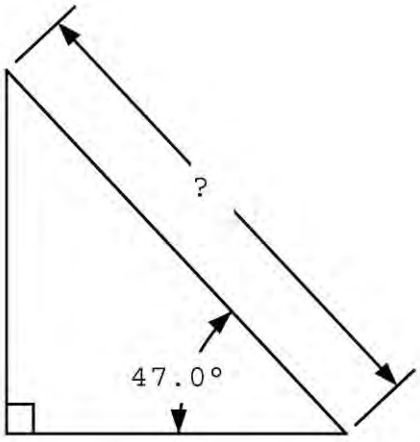


Area = ?

09B-20 = _____

09F-20.

RIGHT TRIANGLE

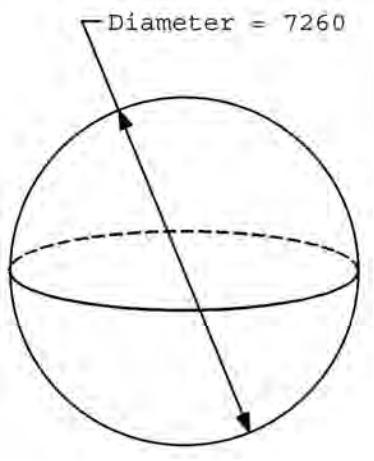


Area = 0.051

09F-20 = _____

05B-30.

SPHERE

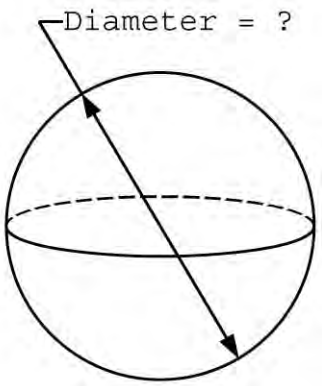


Volume = ?

05B-30 = _____

09F-29.

SPHERE

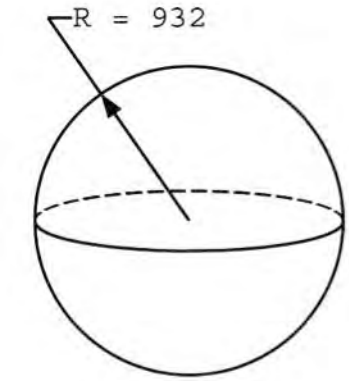


Volume = 7.88

09F-29 = _____

07F-29.

SPHERE

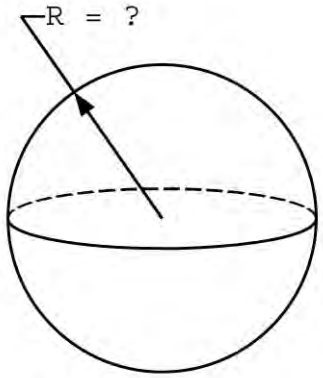


Volume = ?

07F-29 = _____

08G-29.

SPHERE

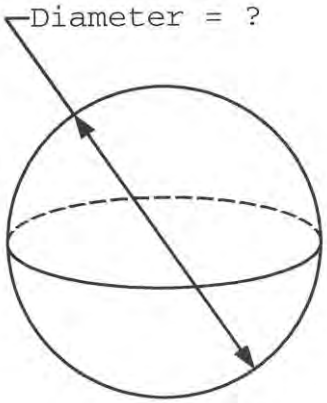


VOLUME = 654

08G-29 = _____

06F-29.

SPHERE

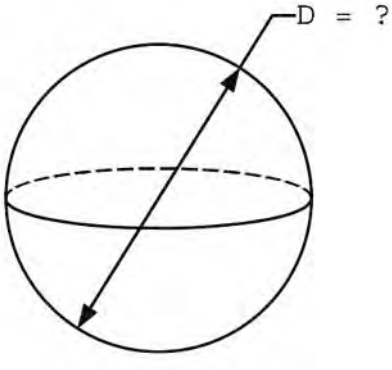


Area = 972

06F-29 = _____

07B-30.

SPHERE

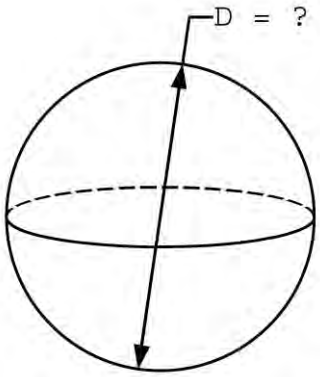


Total Surface Area = 235

07B-30 = _____

08F-30.

SPHERE

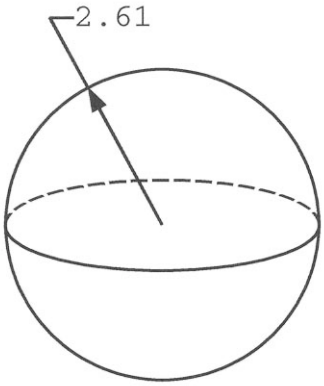


SURFACE AREA = 0.0395

08F-30 = _____

06A-29.

SPHERE

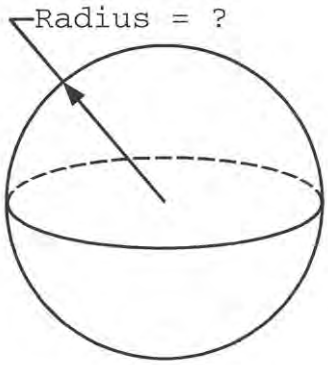


Area = ?

06A-29 = _____

06H-30.

SPHERE

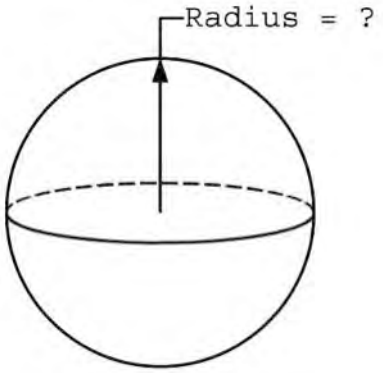


Total Surface Area = 0.548

06H-30 = _____

07C-29.

SPHERE

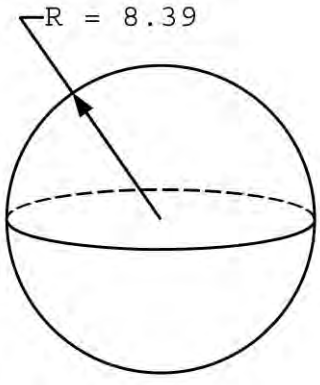


Total Surface Area = 304

07C-29 = _____

08D-30.

SPHERE

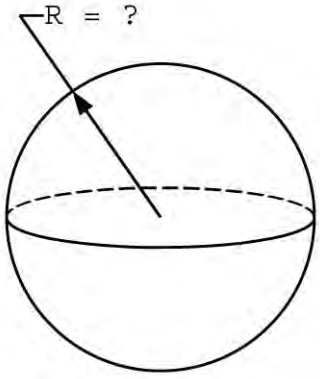


SURFACE AREA =?

08D-30 = _____

09I-29.

SPHERE



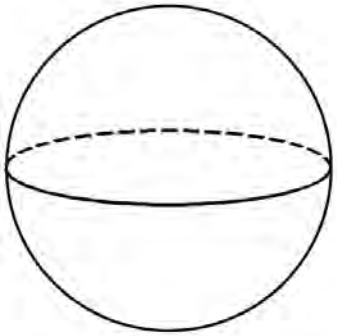
Surface Area = 8.39

09I-29 = _____

05C-30.

SPHERE

Circumference = 0.71

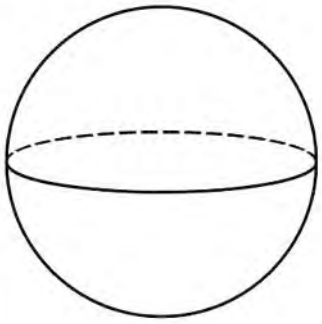


Area = ?

05C-30 = _____

07E-30.

SPHERE



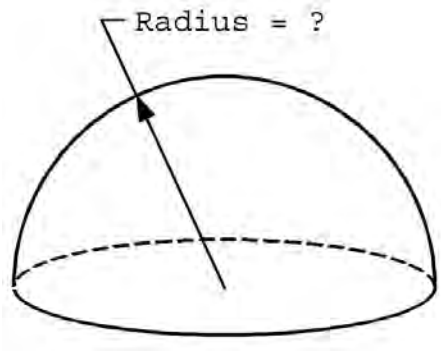
Volume = 0.139

Total Surface Area = ?

07E-30 = _____

05A-30.

HEMISPHERE

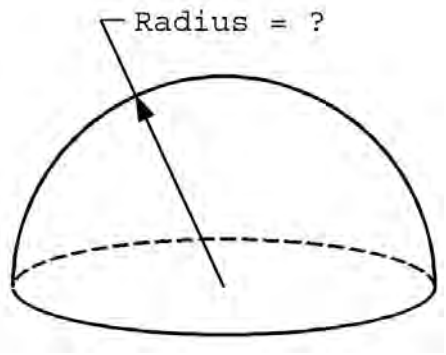


Volume = 0.81

05A-30 = _____

05G-30.

HEMISPHERE

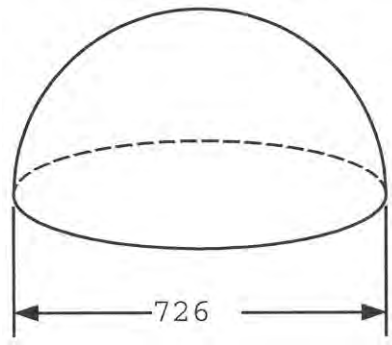


Volume = 10.2

05G-30 = _____

06I-30.

HEMISPHERE

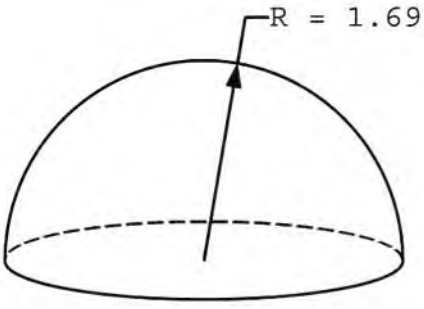


Volume = ?

06I-30 = _____

07G-29.

HEMISPHERE

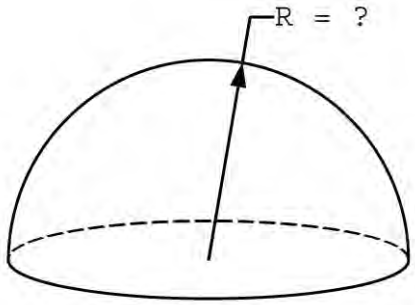


Volume = ?

07G-29 = _____

08C-30.

HEMISPHERE

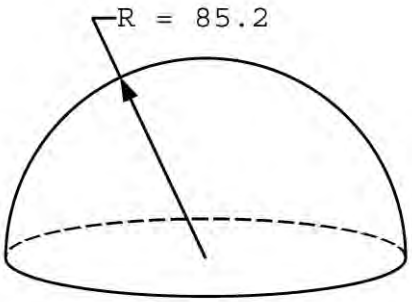


VOLUME = 281

08C-30 = _____

08I-29.

HEMISPHERE

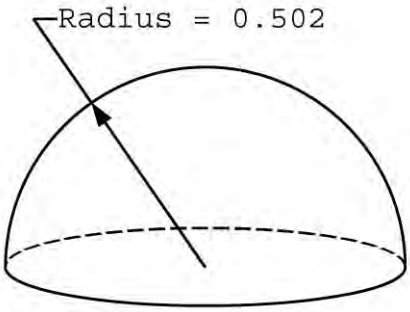


VOLUME = ?

08I-29 = _____

09H-29.

HEMISPHERE

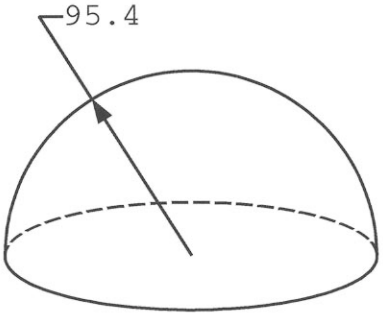


Volume = ?

09H-29 = _____

06C-30.

HEMISPHERE

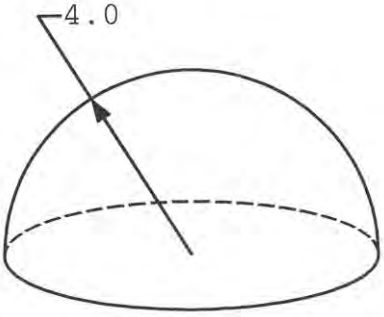


Total Surface Area = ?

06C-30 = _____

06E-30.

HEMISPHERE

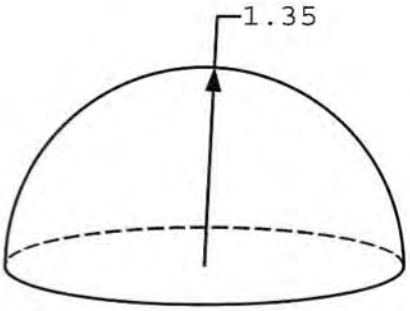


Total Surface Area = ?

06E-30 = _____

07D-29.

HEMISPHERE

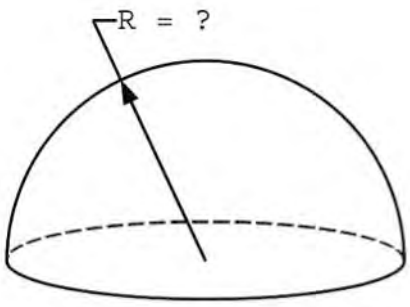


Total Surface Area = ?

07D-29 = _____

07I-30.

HEMISPHERE

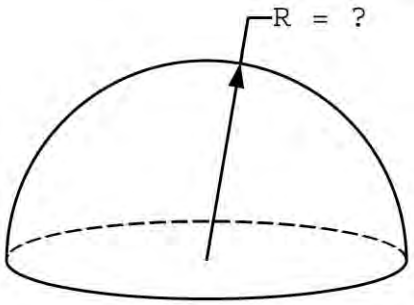


Total Surface Area = 0.259

07I-30 = _____

09A-30.

HEMISPHERE

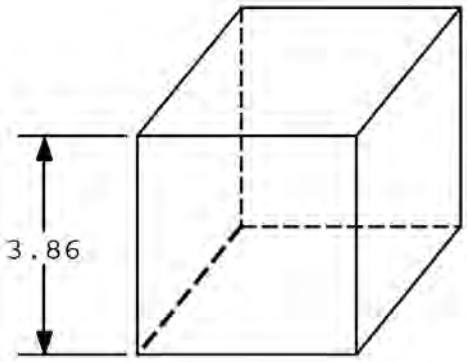


Total Surface Area = 187

09A-30 = _____

05F-29.

CUBE

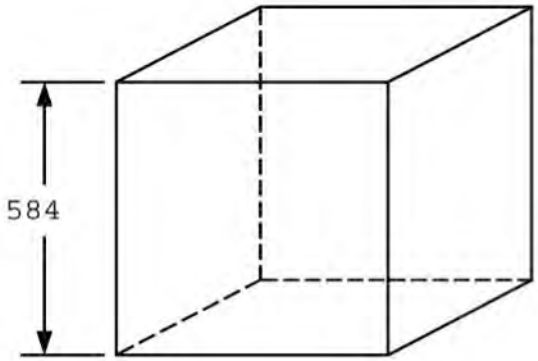


Volume = ?

05F-29 = _____

07B-29.

CUBE

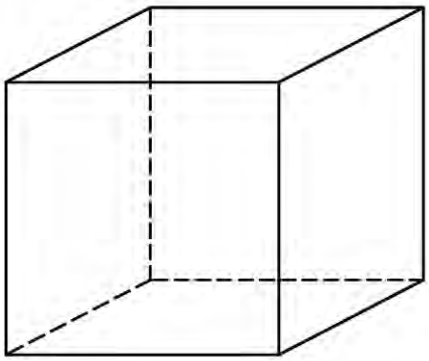


Volume = ?

07B-29 = _____

08D-29.

CUBE

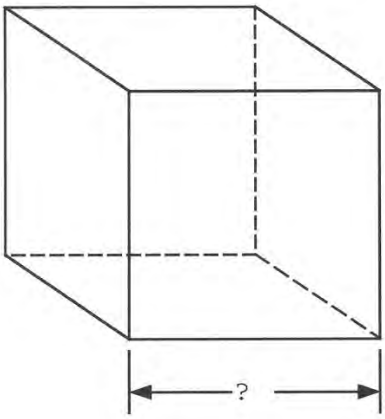


SURFACE AREA = 4880
VOLUME = ?

08D-29 = _____

06G-29.

CUBE



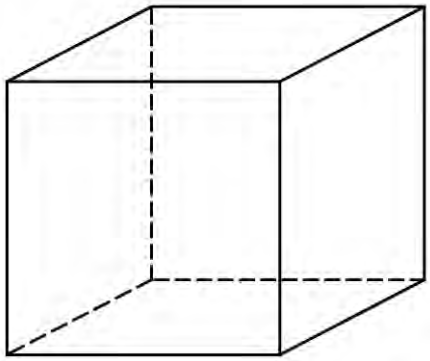
Total Surface Area = 113

06G-29 = _____

09G-29.

CUBE

Volume = ?

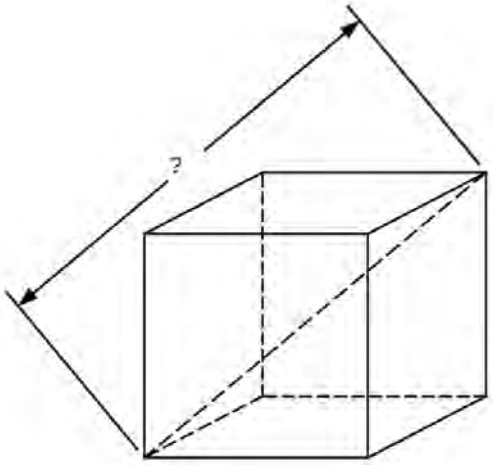


Total Surface Area = 607

09G-29 = _____

09E-29.

CUBE

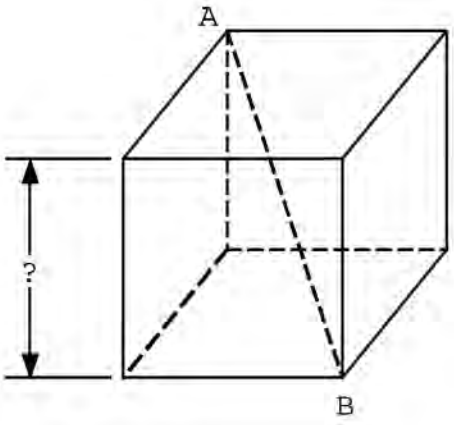


Total Surface Area = 0.912

09E-29 = _____

05D-29.

CUBE

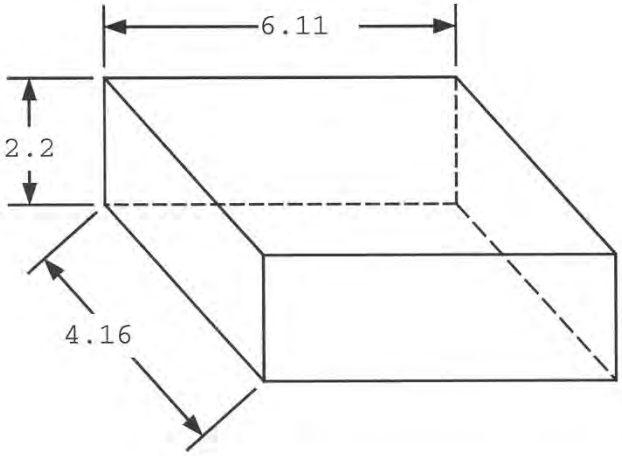


AB = 41.8

05D-29 = _____

06H-29.

RECTANGULAR SOLID

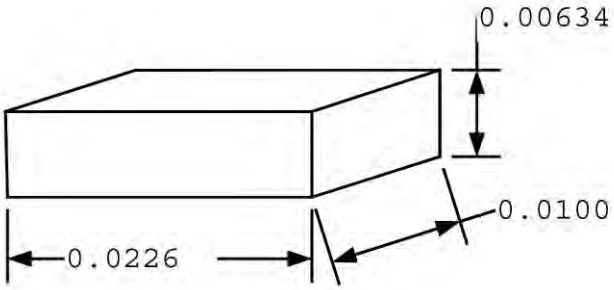


Volume = ?

06H-29 = _____

08E-30.

RECTANGULAR SOLID

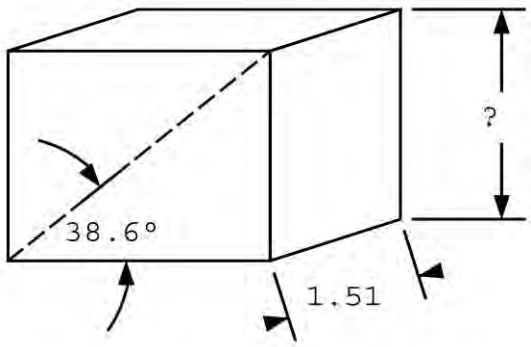


VOLUME = ?

08E-30 = _____

09I-30.

RECTANGULAR SOLID

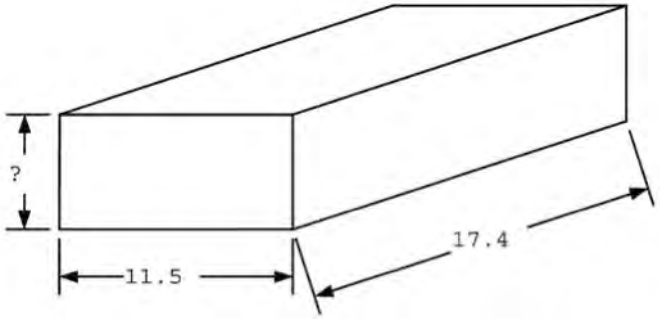


Volume = 8.58

09I-30 = _____

07A-30.

RECTANGULAR SOLID

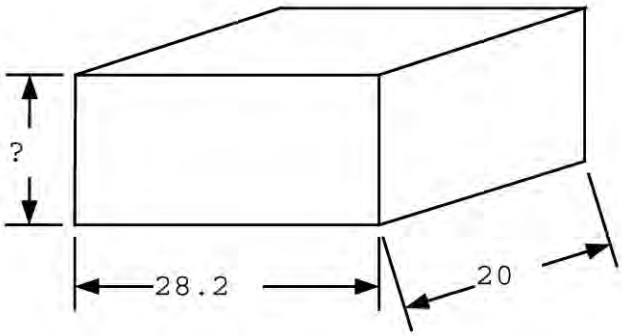


Total Surface Area = 730

07A-30 = _____

08B-29.

RECTANGULAR SOLID

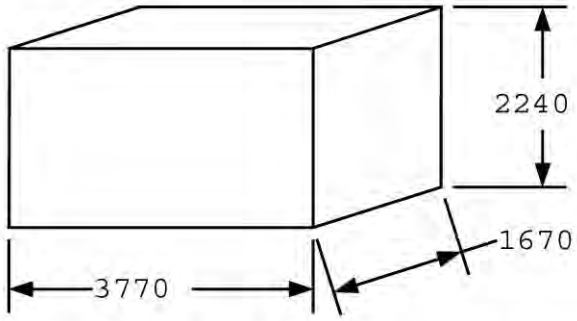


SURFACE AREA = 2470

08B-29 = _____

09H-30.

RECTANGULAR SOLID



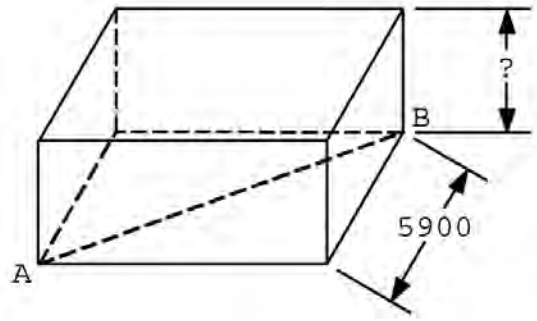
Total Surface Area = ?

09H-30 = _____

05H-29.

RECTANGULAR SOLID

AB = 9120

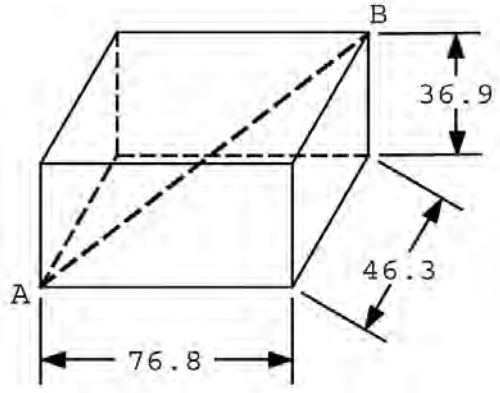


Total Surface Area = 2.05×10^8

05H-29 = _____

05A-29.

RECTANGULAR SOLID

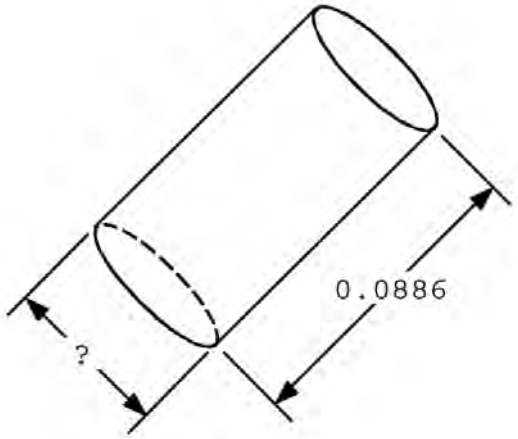


AB = ?

05A-29 = _____

05C-29.

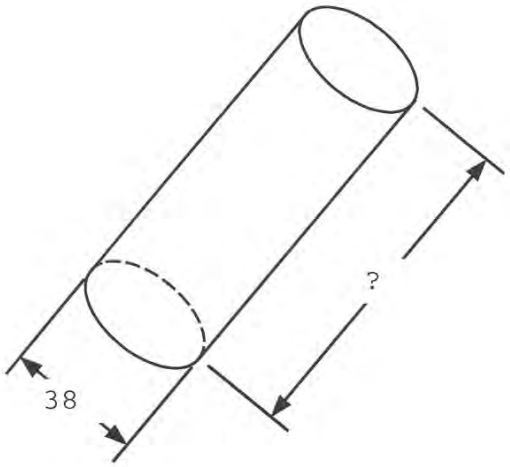
CYLINDER



Volume = 0.000165

05C-29 = _____

06D-29. CYLINDER

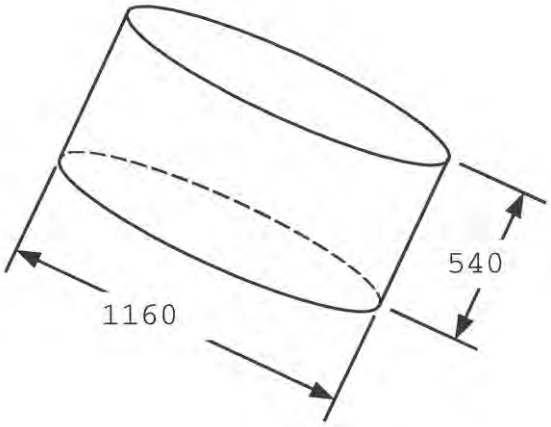


Volume = 104,000

06D-29 = _____

06G-30.

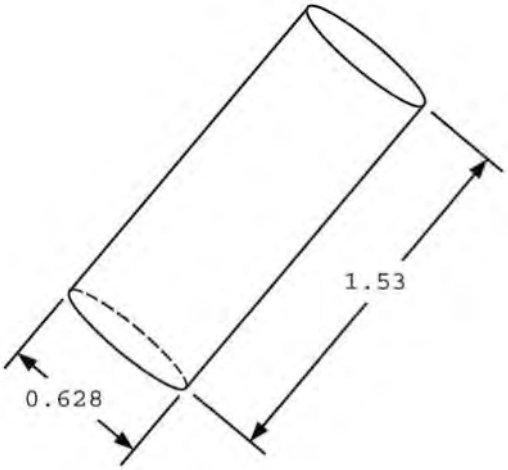
CYLINDER



Volume = ?

06G-30 = _____

07D-30. CYLINDER

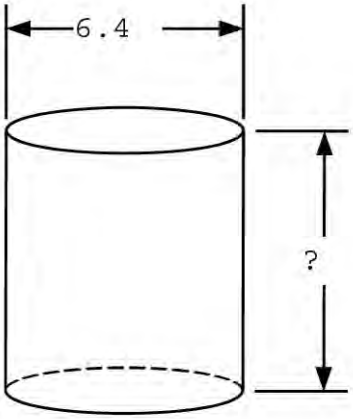


Volume = ?

07D-30 = _____

08H-30.

CYLINDER

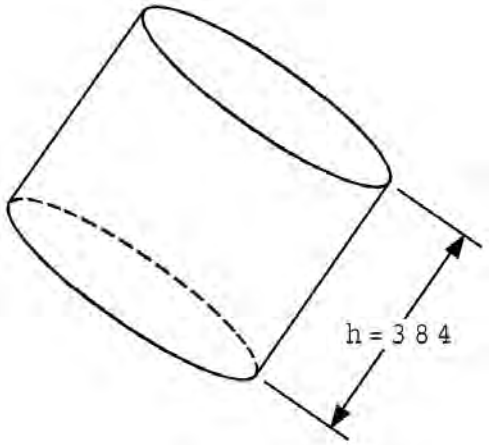


VOLUME = 226

08H-30 = _____

05G-29. CYLINDER

D/h = 1.28

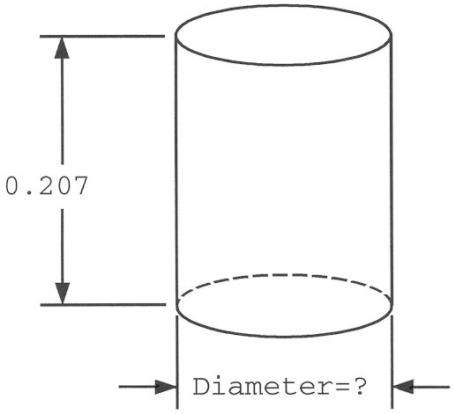


Total Surface Area = ?

05G-29 = _____

06B-29.

CYLINDER

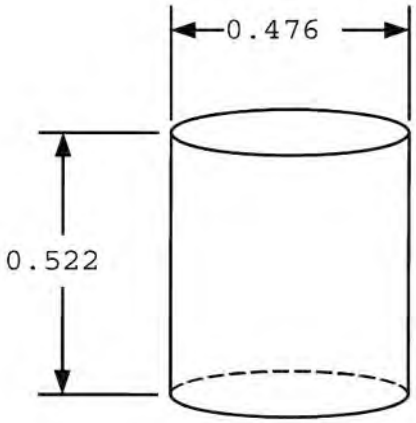


Lateral Surface Area = 0.103

06B-29 = _____

07F-30.

CYLINDER

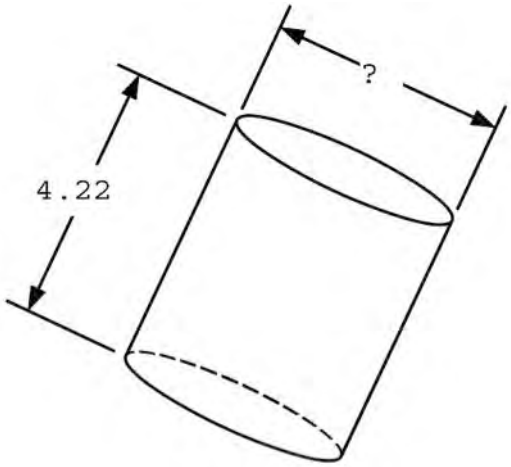


Lateral Surface Area = ?

07F-30 = _____

07G-30.

CYLINDER

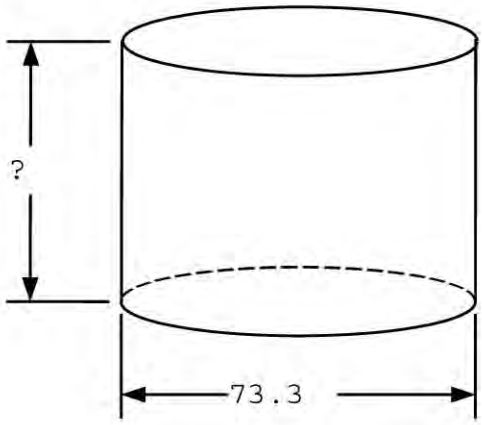


Total Surface Area = 74.2

07G-30 = _____

08C-29.

CYLINDER

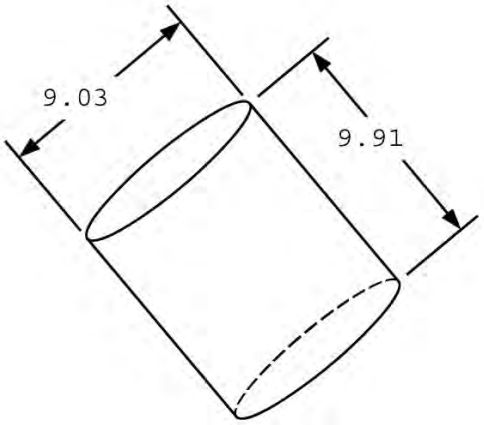


TOTAL SURFACE AREA = 20,800

08C-29 = _____

08G-30.

CYLINDER

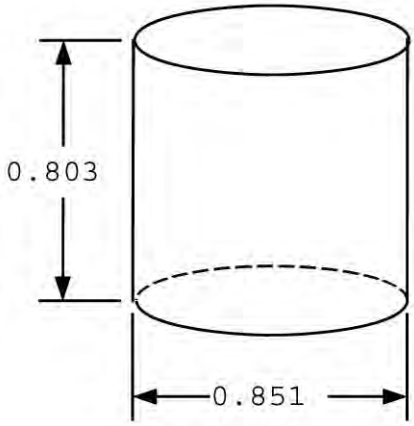


TOTAL SURFACE AREA = ?

08G-30 = _____

09B-30.

CYLINDER

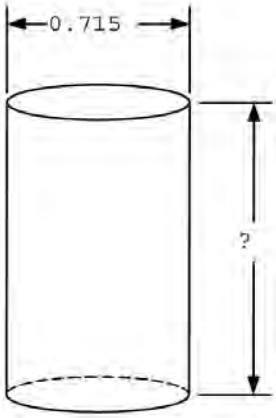


Total Surface Area = ?

09B-30 = _____

09F-30.

CYLINDER

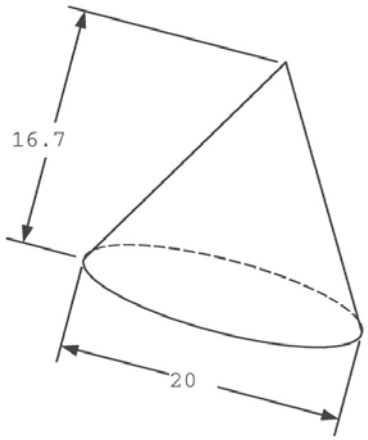


Lateral Surface Area = 2.59

09F-30 = _____

06B-30.

CONE

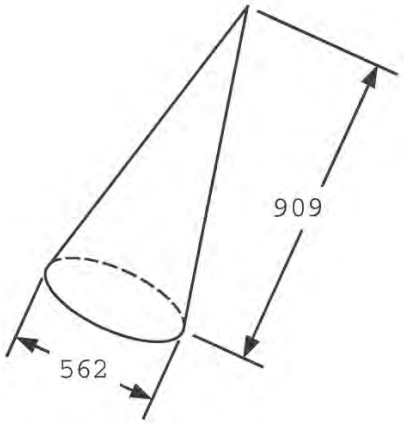


Volume = ?

06B-30 = _____

06E-29.

CONE

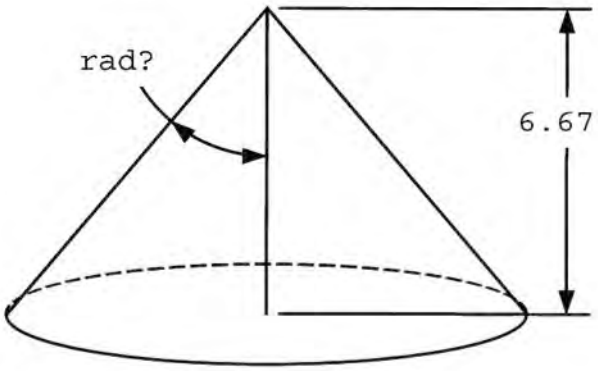


Volume = ?

06E-29 = _____

07A-29.

CONE

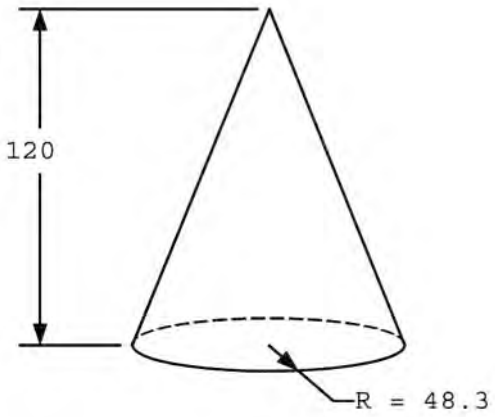


Volume = ?

07A-29 = _____

07E-29.

CONE

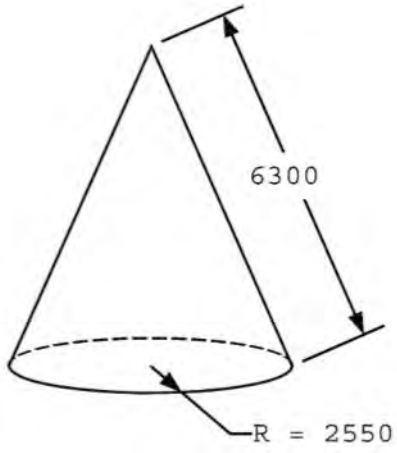


Volume = ?

07E-29 = _____

07H-29.

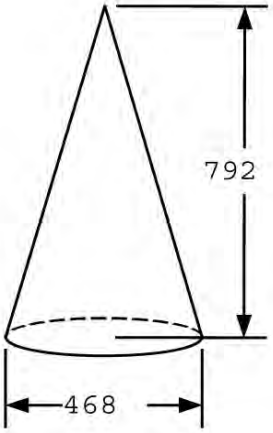
CONE



Volume = 220

08A-29.

CONE

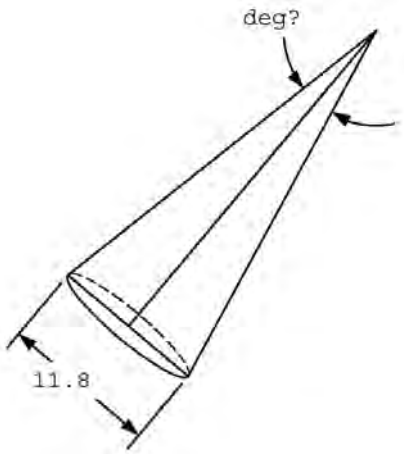


VOLUME = ?

08A-29 = _____

08E-29.

CONE

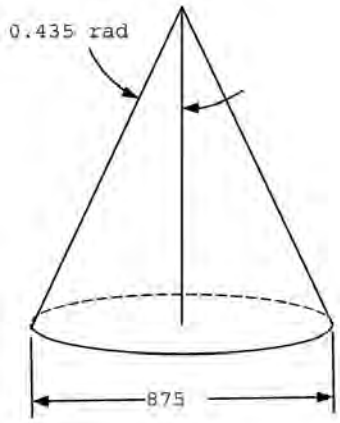


VOLUME = 1050

08E-29 = _____

08F-29.

CONE

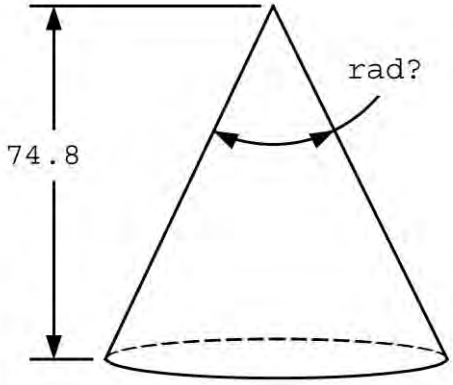


VOLUME = ?

08F-29 = _____

09B-29.

CONE

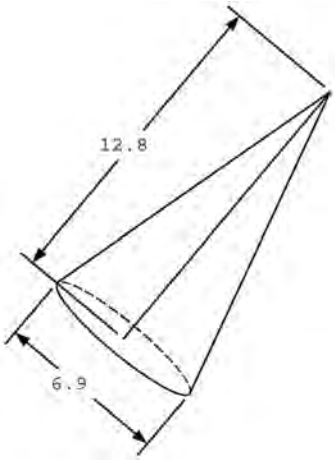


Volume = 100,000

09B-29 = _____

09E-30.

CONE

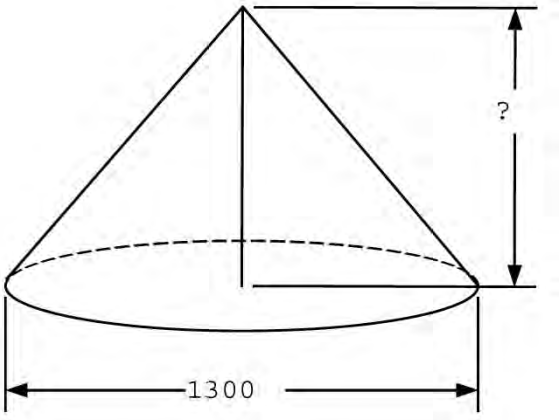


Volume = ?

09E-30 = _____

08H-29.

CONE

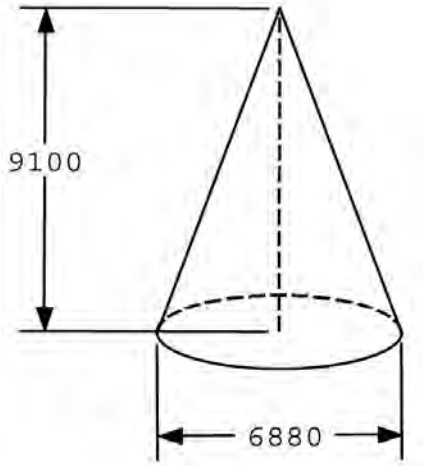


TOTAL SURFACE AREA = $3.39X10^6$

08H-29 = _____

05B-29.

CONE

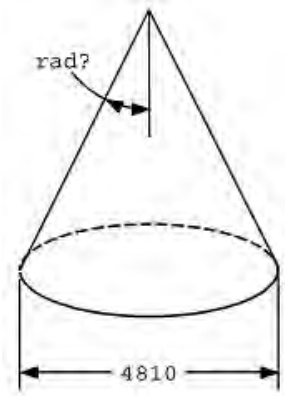


Lateral Surface Area = ?

05B-29 = _____

05E-30.

CONE

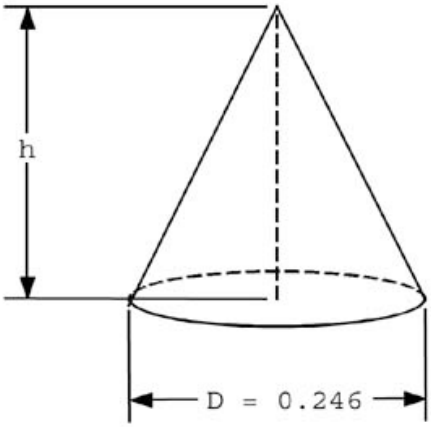


Lateral Surface Area = 4.05×10^7

05E-30 = _____

05I-29. CONE

D/h = 1.03



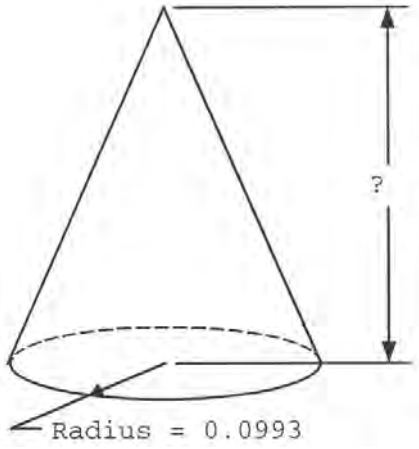
Lateral Surface Area = ?

05I-29 = _____

06I-29.

CONE

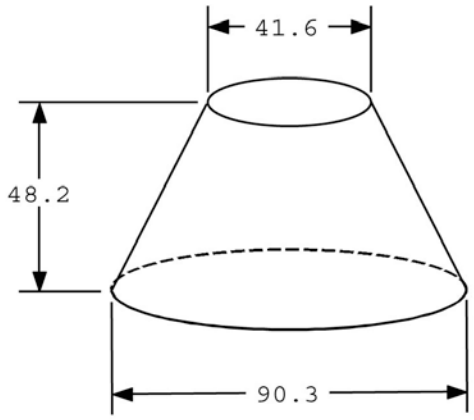
Lateral Surface Area = 0.0771



06I-29 = _____

05E-29.

FRUSTUM

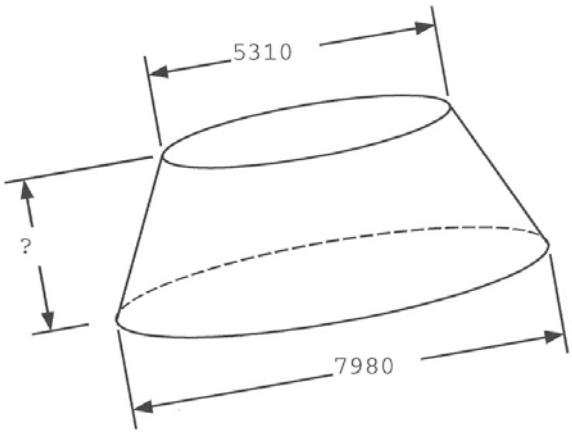


Volume = ?

05E-29 = _____

06A-30.

FRUSTUM

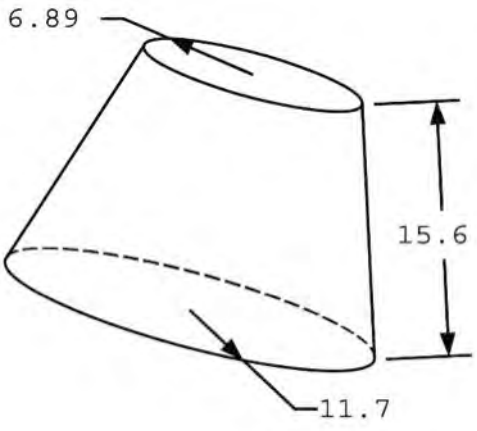


Volume = 9.98×10^{10}

06A-30 = _____

07C-30.

FRUSTUM

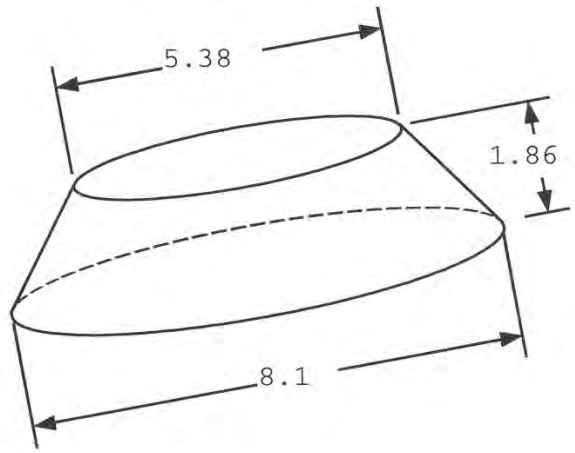


Volume = ?

07C-30 = _____

06D-30.

FRUSTRUM

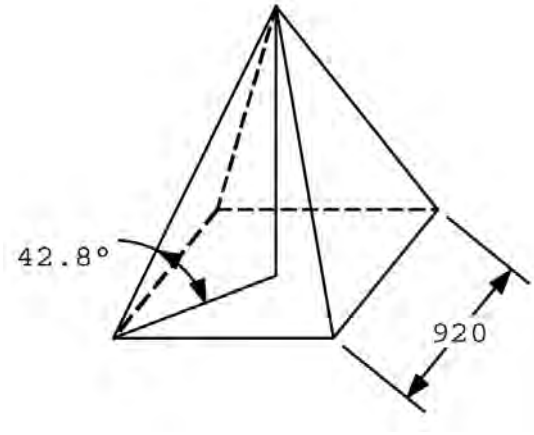


Lateral Surface Area = ?

06D-30 = _____

05H-30.

SQUARE PRYAMID

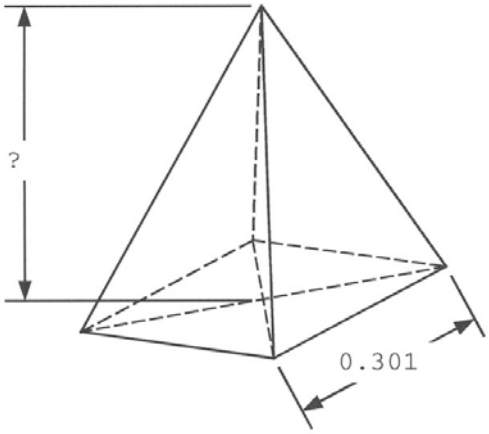


Volume = ?

05H-30 = _____

06C-29.

SQUARE PYRAMID

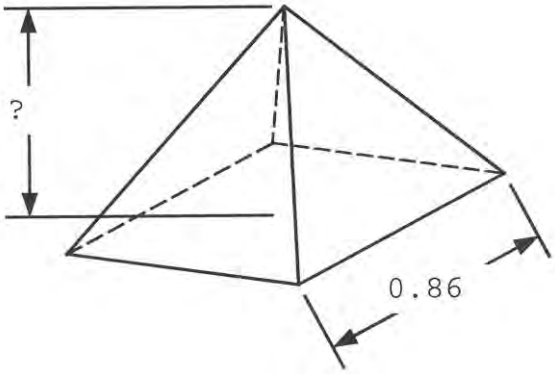


Volume = 0.0137

06C-29 = _____

06F-30.

SQUARE PRYAMID

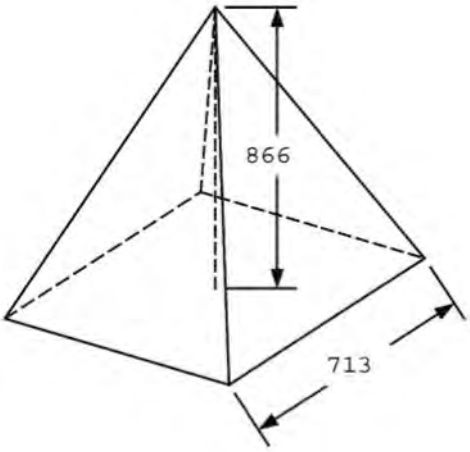


Volume = 0.190

06F-30 = _____

07I-29.

SQUARE PYRAMID

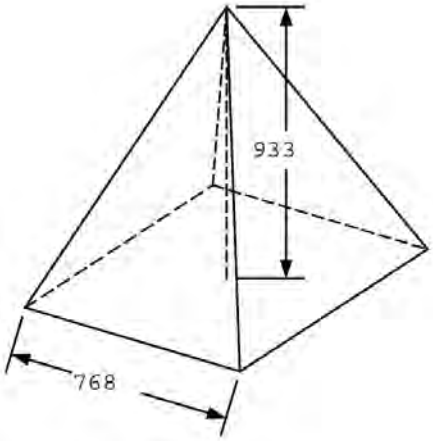


Volume = ?

07I-29 = _____

08B-30.

SQUARE PYRAMID

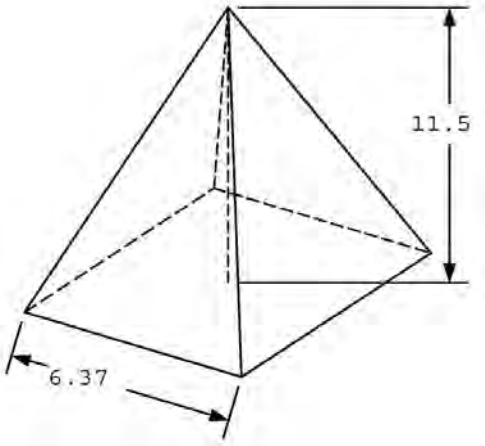


VOLUME = ?

08B-30 = _____

09A-29.

SQUARE PYRAMID

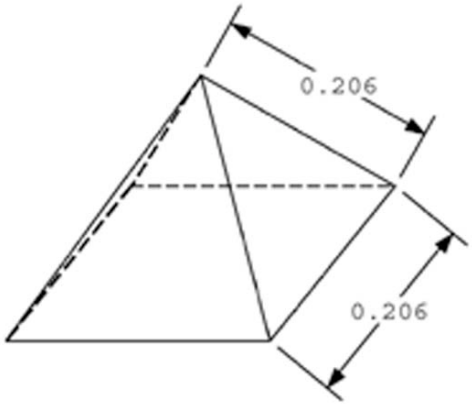


Volume = ?

09A-29 = _____

05D-30.

SQUARE PYRAMID

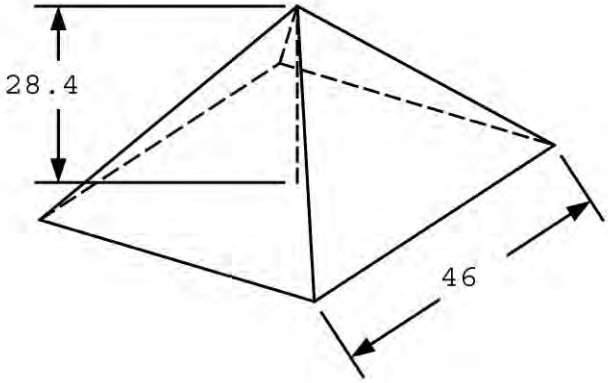


Total Surface Area = ?

05D-30 = _____

08I-30.

SQUARE PYRAMID

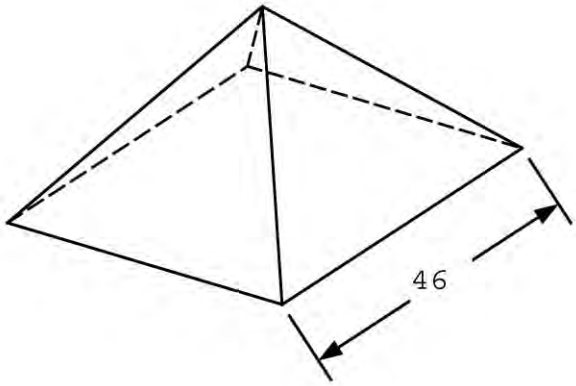


TOTAL SURFACE AREA = ?

08I-30 = _____

09G-30.

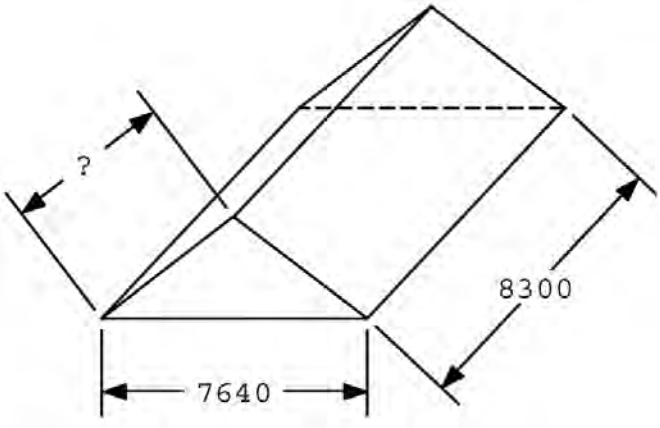
PYRAMID WITH EQUILATERAL TRIANGLES



Total Surface Area = ?

09G-30 = _____

05I-30. ISOSCELES PRISM

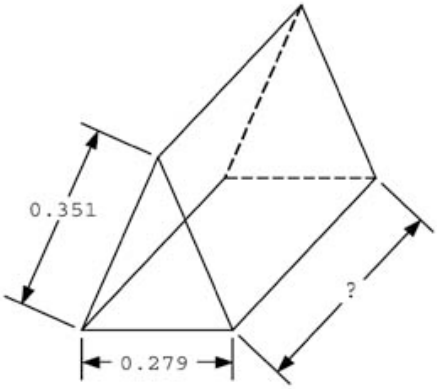


Volume = 9.52×10^{10}

05I-30 = _____

05F-30.

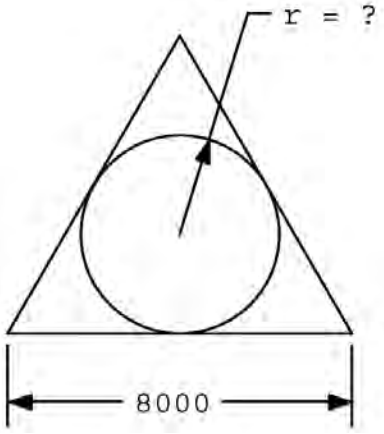
ISOSCELES PRISM



Total Surface Area = 0.56

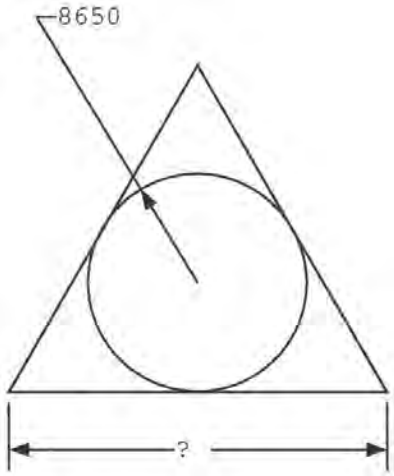
05F-30 = _____

05F-39.
CIRCLE AND EQUILATERAL TRIANGLE



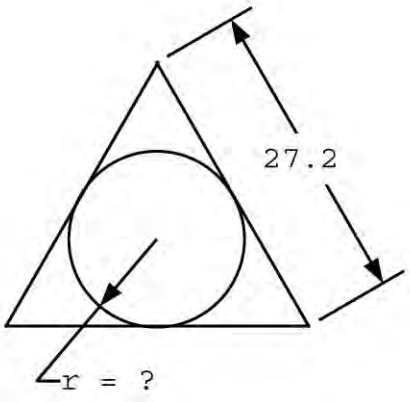
05F-39 = _____

06C-39.
CIRCLE AND EQUILATERAL TRIANGLE



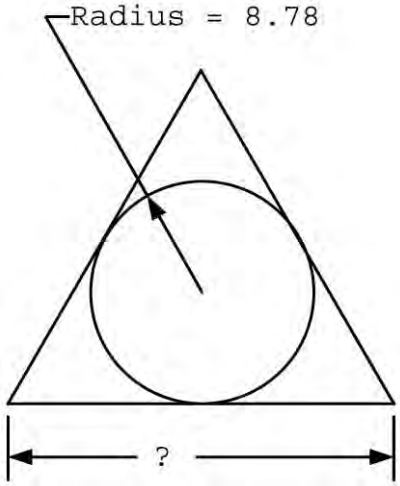
06C-39 = _____

08D-39.
EQUILATERAL TRIANGLE AND CIRCLE



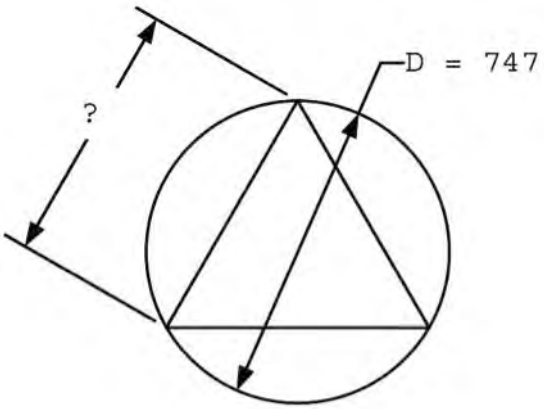
08D-39 = _____

09A-39.
EQUILATERAL TRIANGLE AND CIRCLE



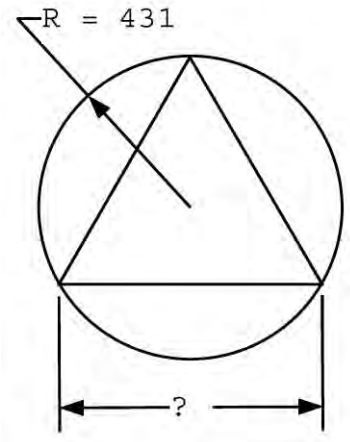
09A-39 = _____

07B-40.
EQUILATERAL TRIANGLE AND CIRCLE



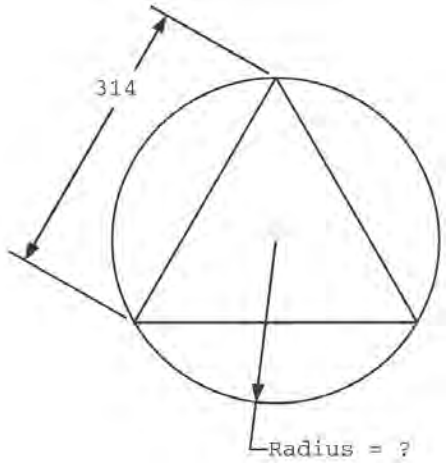
07B-40 = _____

08I-39.
EQUILATERAL TRIANGLE AND CIRCLE



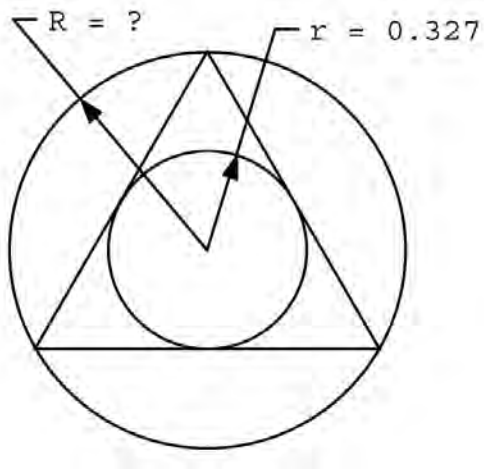
08I-39 = _____

06H-40.
CIRCLE AND EQUILATERAL TRIANGLE



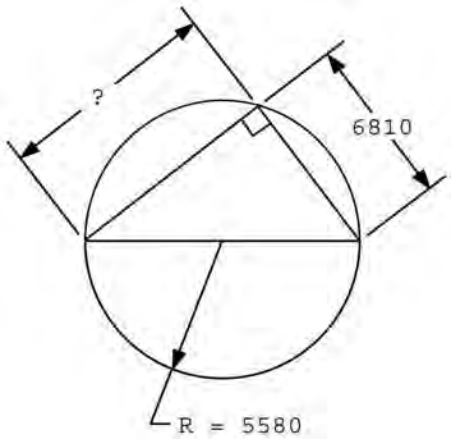
06H-40 = _____

05C-39.
CIRCLE AND EQUILATERAL TRIANGLE



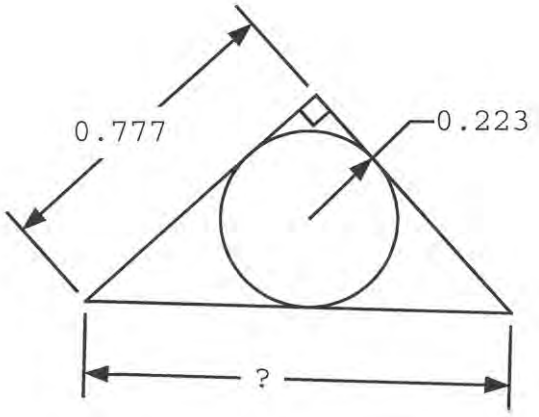
05C-39 = _____

05A-39.
CIRCLE AND RIGHT TRIANGLE



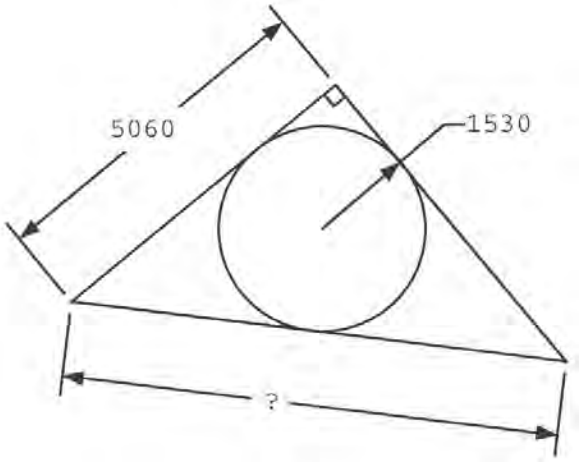
05A-39 = _____

06E-39.
CIRCLE AND RIGHT TRIANGLE



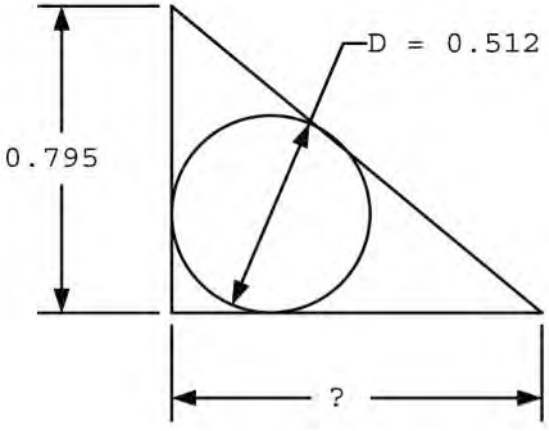
06E-39 = _____

06I-39.
CIRCLE AND RIGHT TRIANGLE



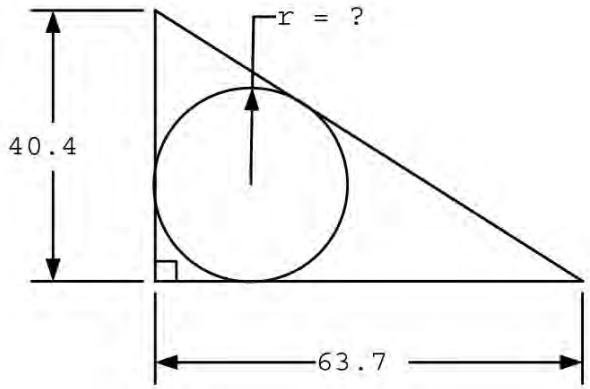
06I-39 = _____

07G-40.
RIGHT TRIANGLE AND CIRCLE



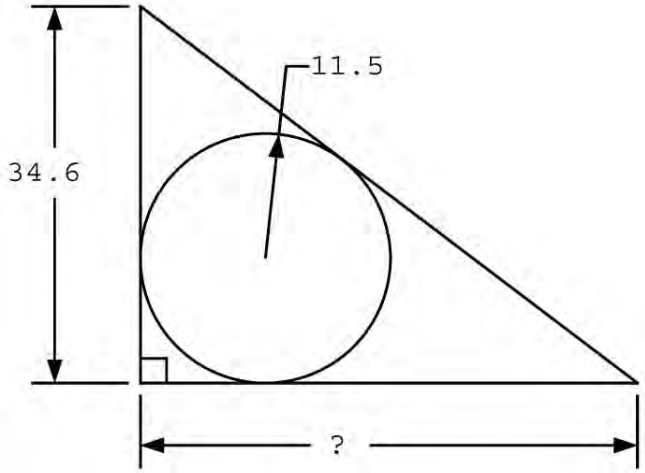
07G-40 = _____

08A-39.
RIGHT TRIANGLE AND CIRCLE



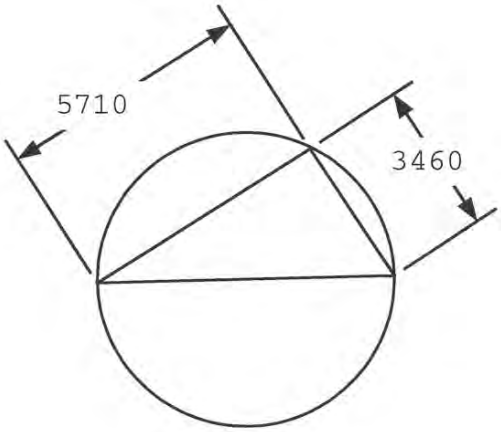
08A-39 = _____

09I-39.
RIGHT TRIANGLE AND CIRCLE



09I-39 = _____

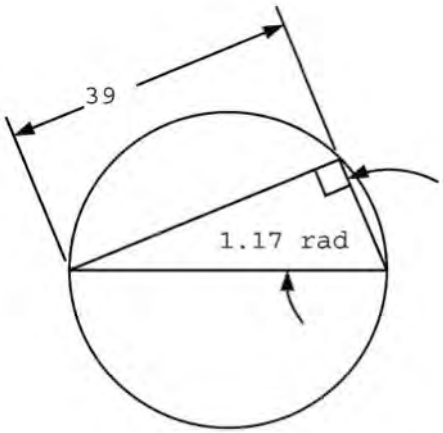
06B-40.
CIRCLE AND RIGHT TRIANGLE



Diameter = ?

06B-40 = _____

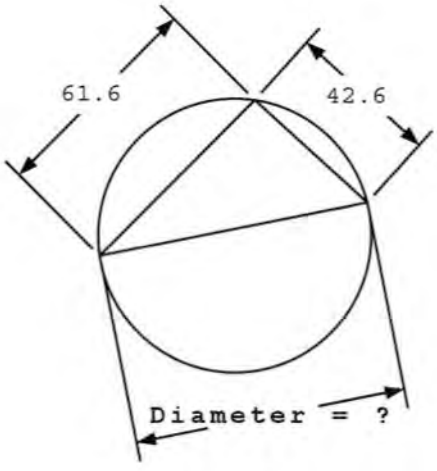
07D-39.
RIGHT TRIANGLE AND CIRCLE



Circle Area = ?

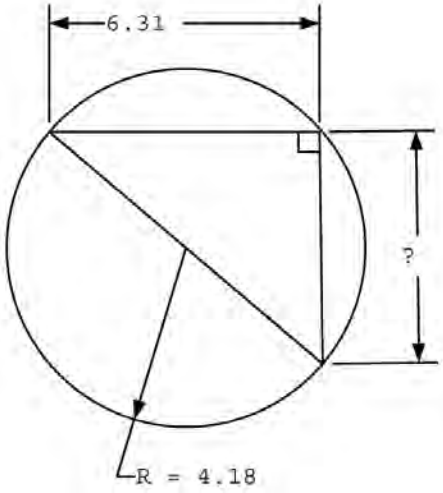
07D-39 = _____

07C-40.
TRIANGLE AND CIRCLE



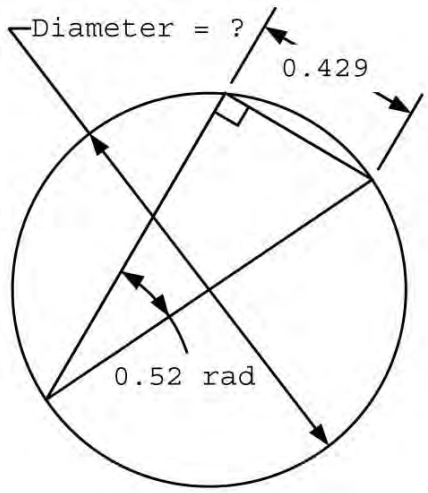
07C-40 = _____

08G-39.
RIGHT TRIANGLE AND CIRCLE



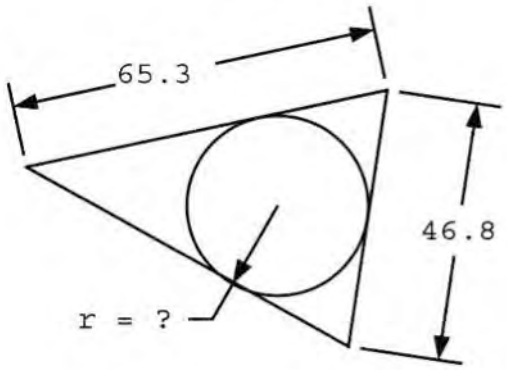
08G-39 = _____

09F-39.
RIGHT TRIANGLE AND CIRCLE



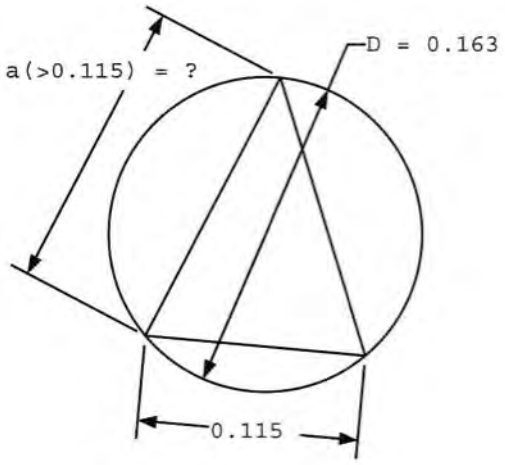
09F-39 = _____

07E-39.
ISOSCELES TRIANGLE AND CIRCLE



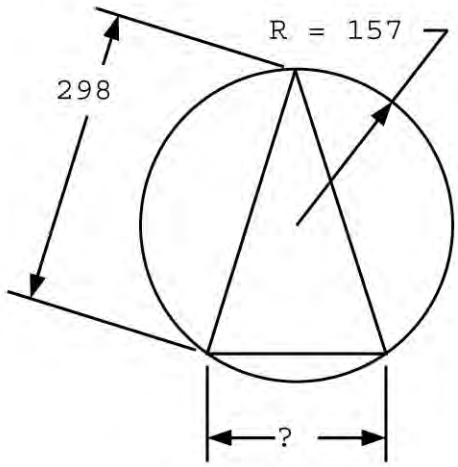
07E-39 = _____

07F-40.
ISOSCELES TRIANGLE AND CIRCLE



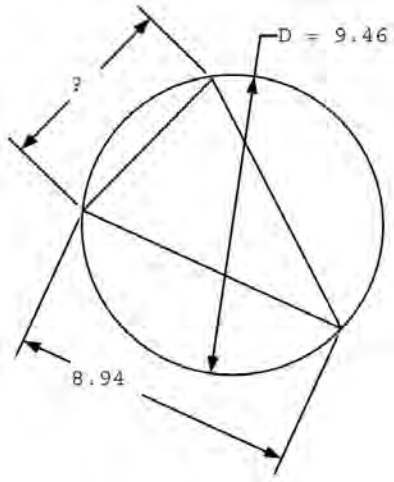
07F-40 = _____

08C-39.
ISOSCELES TRIANGLE AND CIRCLE



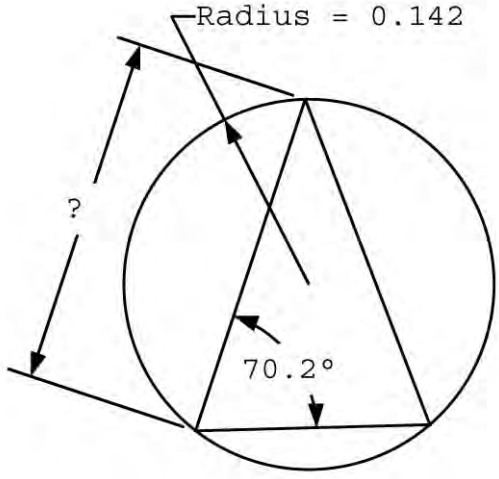
08C-39 = _____

08F-39.
ISOSCELES TRIANGLE AND CIRCLE



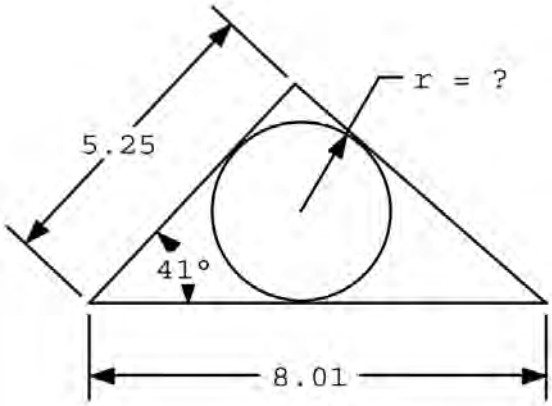
08F-39 = _____

09G-39.
ISOSCELES TRIANGLE AND CIRCLE



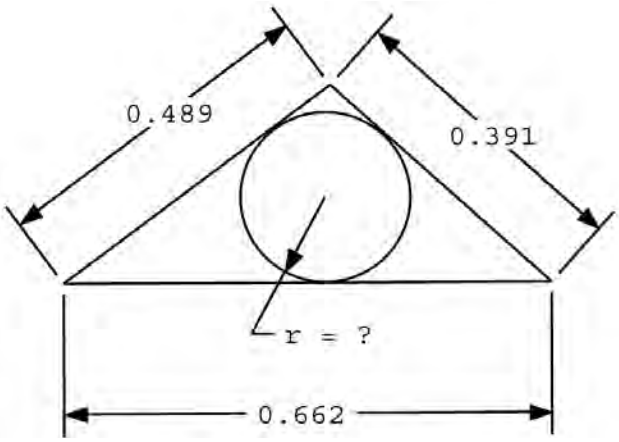
09G-39 = _____

05B-40.
SCALENE TRIANGLE AND CIRCLE



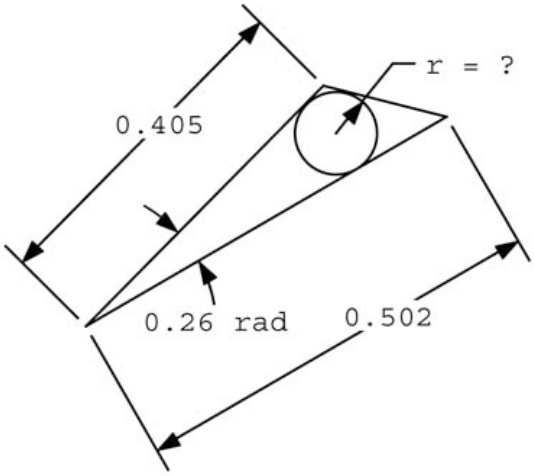
05B-40 = _____

05G-39.
SCALENE TRIANGLE AND CIRCLE



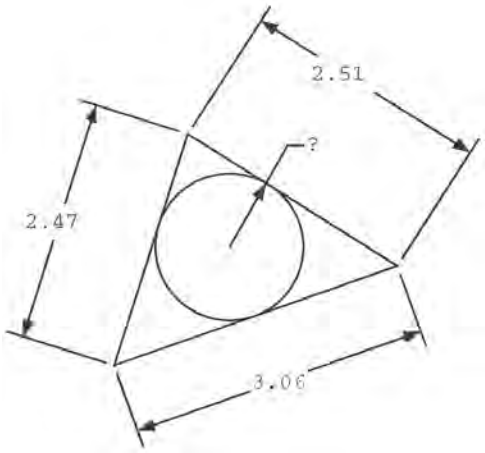
05G-39 = _____

05I-40.
SCALENE TRIANGLE AND CIRCLE



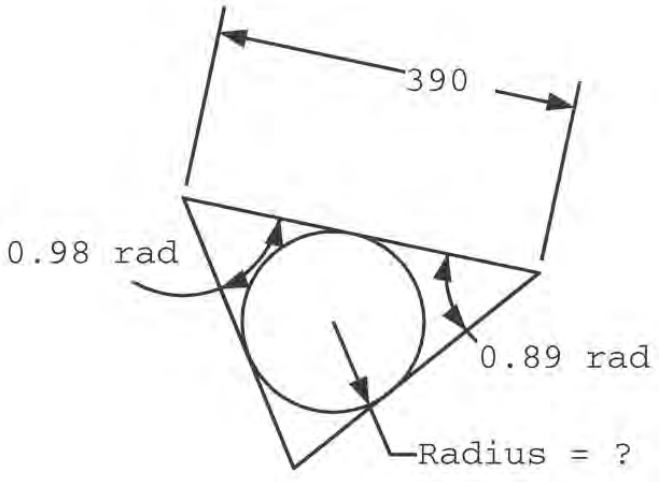
05I-40 = _____

06A-39.
CIRCLE AND SCALENE TRIANGLE



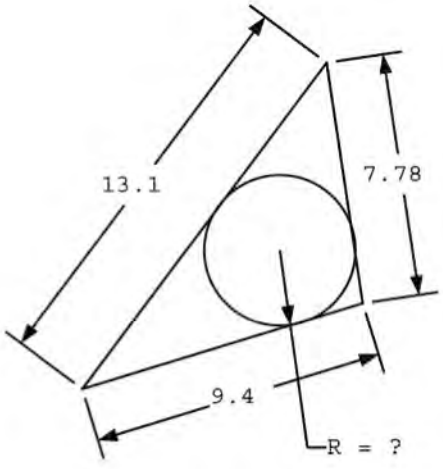
06A-39 = _____

06F-40.
SCALENE TRIANGLE



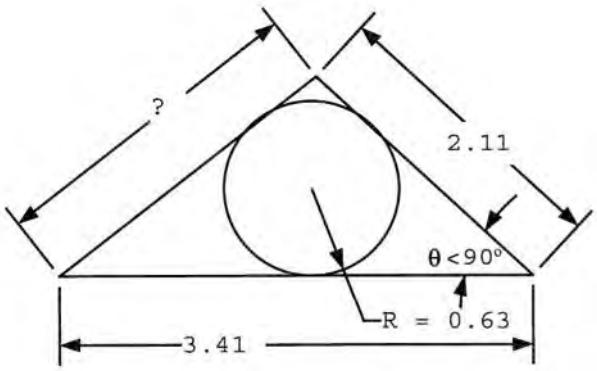
06F-40 = _____

07A-39.
SCALENE TRIANGLE AND CIRCLE



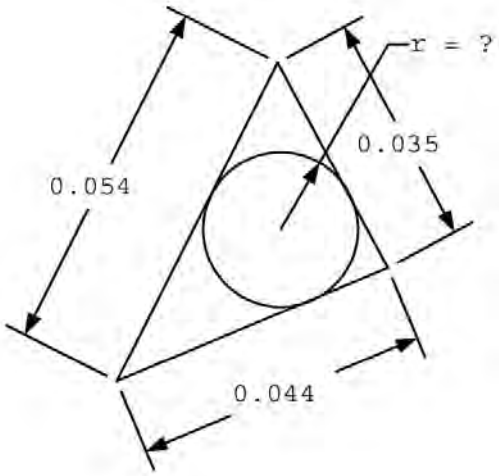
07A-39 = _____

07H-39.
SCALENE TRIANGLE AND CIRCLE



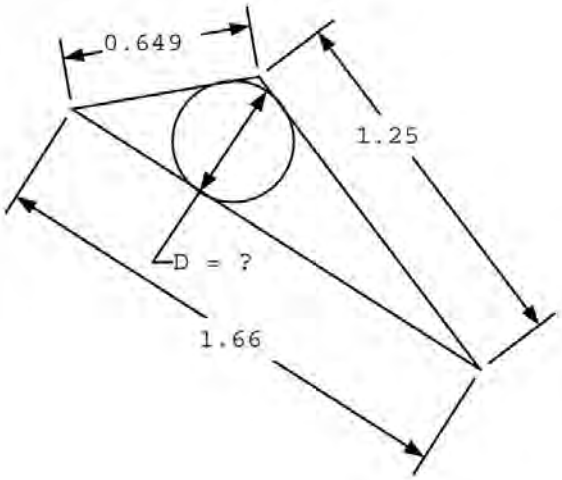
07H-39 = _____

08E-39.
SCALENE TRIANGLE AND CIRCLE



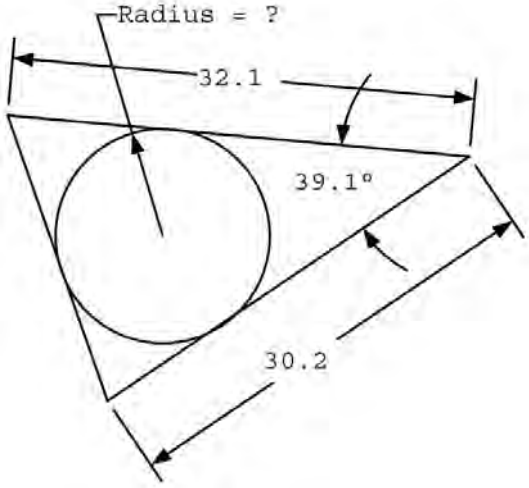
08E-39 = _____

08H-39.
SCALENE TRIANGLE AND CIRCLE



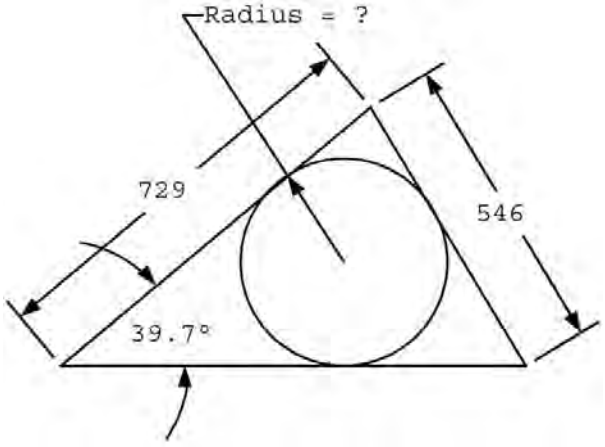
08H-39 = _____

09E-39.
SCALENE TRIANGLE AND CIRCLE



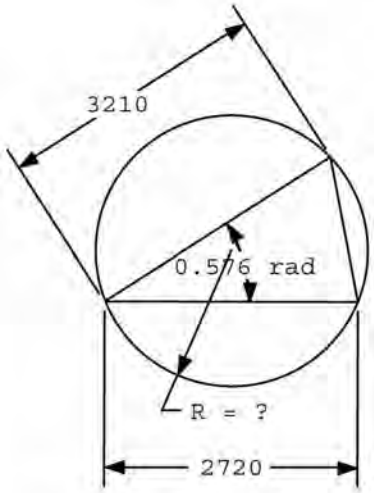
09E-39 = _____

09H-39.
SCALENE TRIANGLE AND CIRCLE



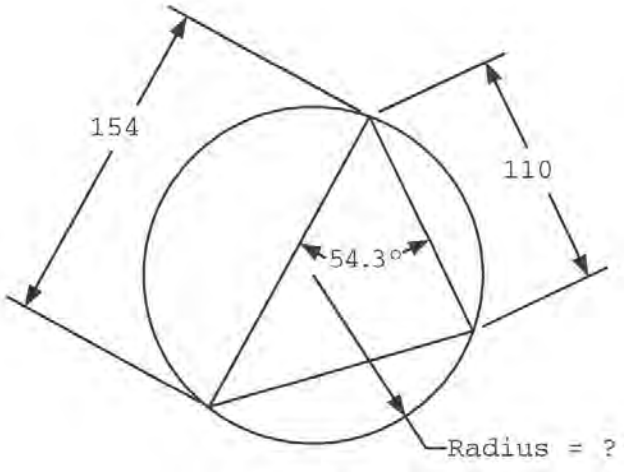
09H-39 = _____

05D-40.
CIRCLE AND SCALENE TRIANGLE



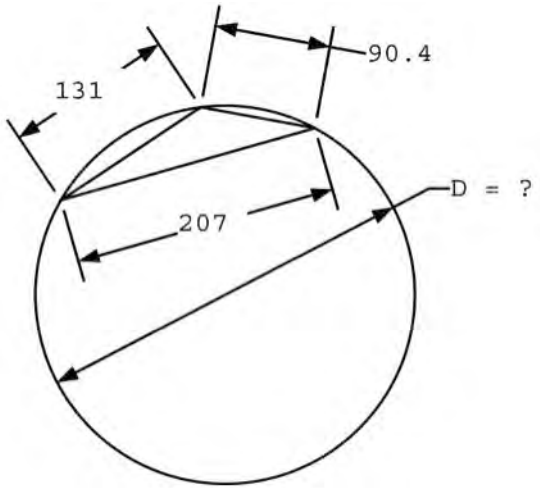
05D-40 = _____

06D-40.
CIRCLE AND SCALENE TRIANGLE



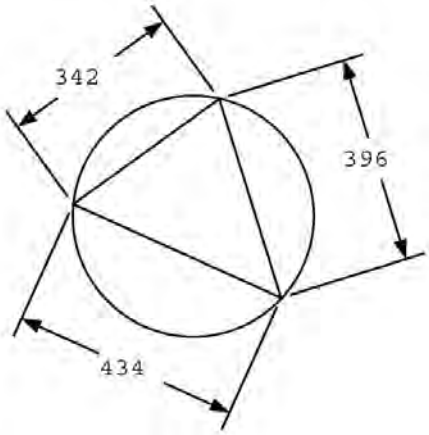
06D-40 = _____

07I-39.
SCALENE TRIANGLE AND CIRCLE



07I-39 = _____

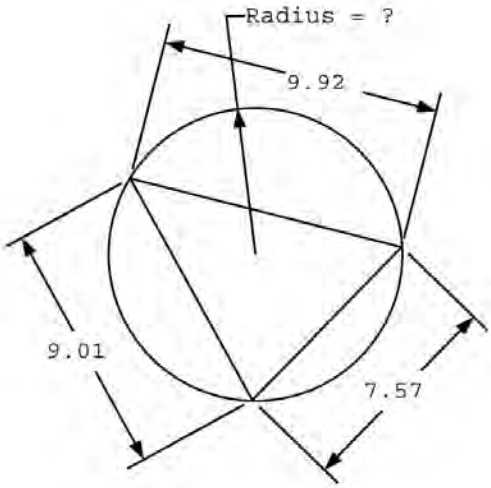
08B-39.
SCALENE TRIANGLE AND CIRCLE



DIAMETER = ?

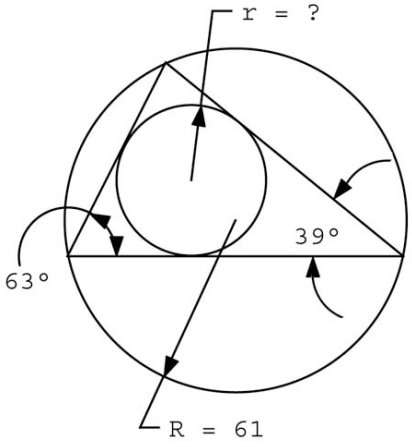
08B-39 = _____

09B-39.
SCALENE TRIANGLE AND CIRCLE



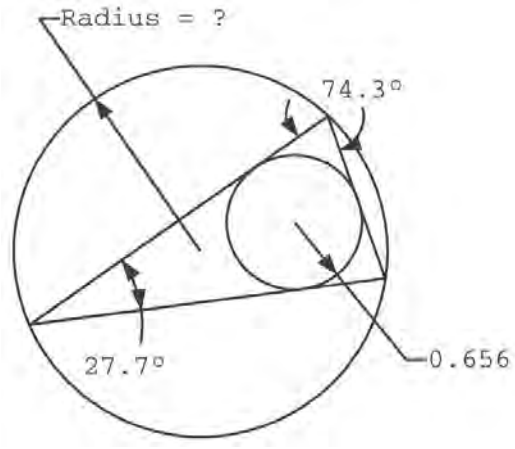
09B-39 = _____

05E-40.
CIRCLES AND SCALENE TRIANGLE



05E-40 = _____

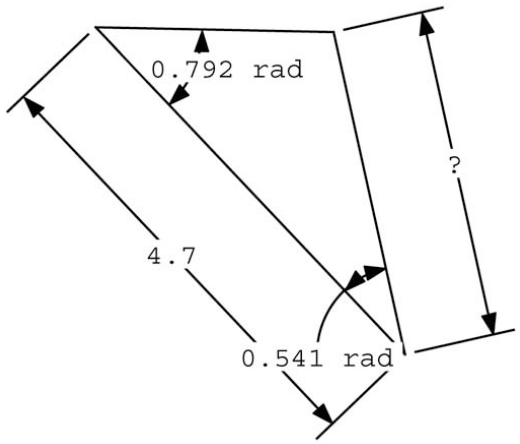
06G-39.
CIRCLES AND SCALENE TRIANGLE



06G-39 = _____

05E-39.

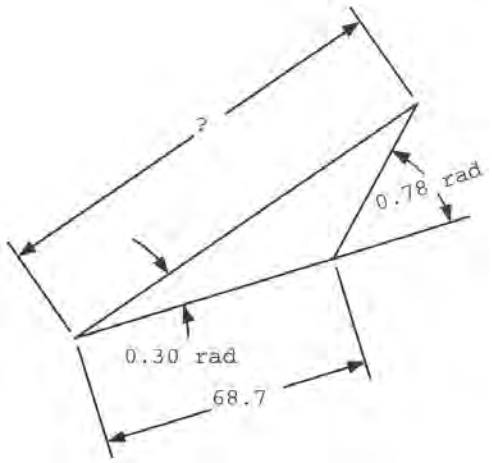
SCALENE TRIANGLE



05E-39 = _____

06A-40.

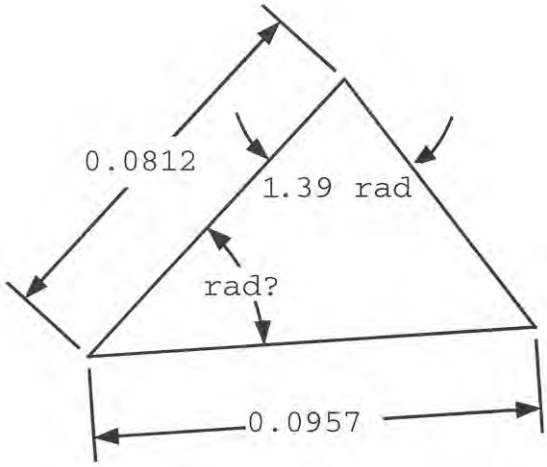
SCALENE TRIANGLE



06A-40 = _____

06D-39.

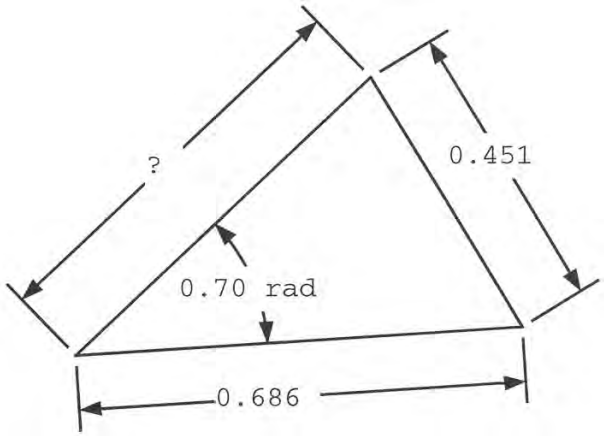
SCALENE TRIANGLE



06D-39 = _____

06G-40.

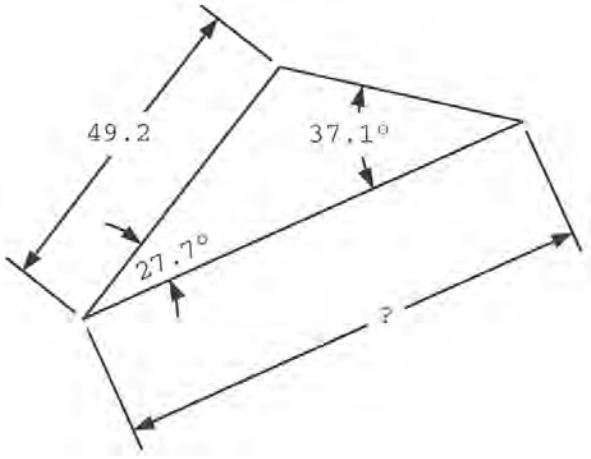
SCALENE TRIANGLE



06G-40 = _____

06H-39.

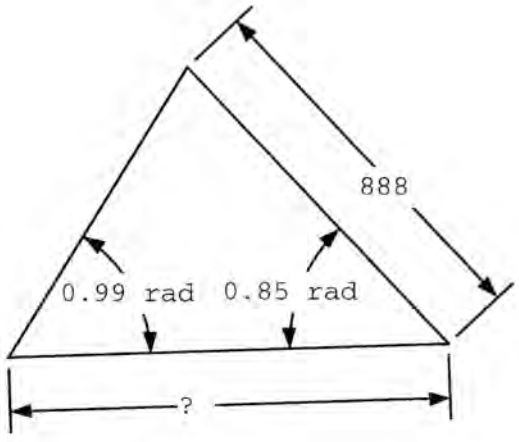
SCALENE TRIANGLE



06H-39 = _____

07A-40.

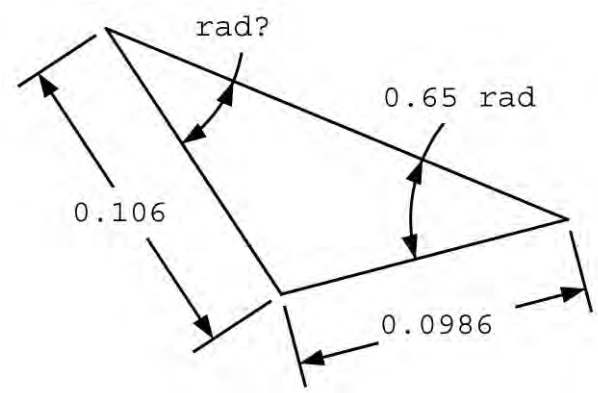
SCALENE TRIANGLE



07A-40 = _____

08A-40.

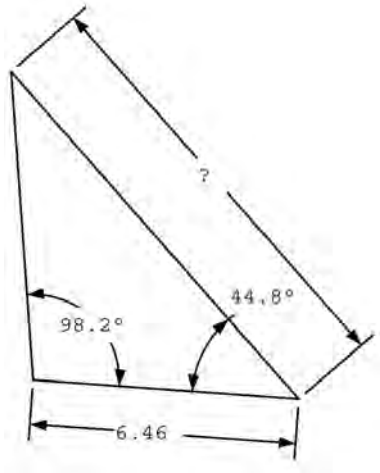
SCALENE TRIANGLE



08A-40 = _____

08D-40.

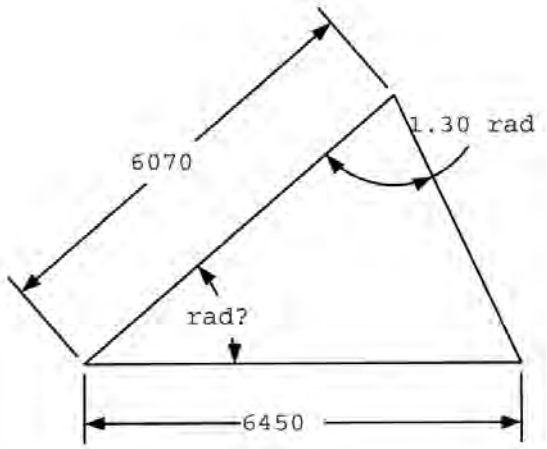
SCALENE TRIANGLE



08D-40 = _____

08E-40.

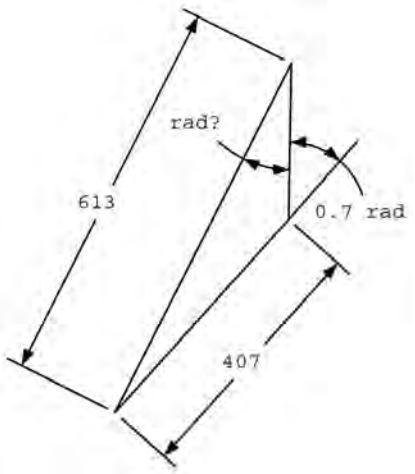
SCALENE TRIANGLE



08E-40 = _____

08H-40.

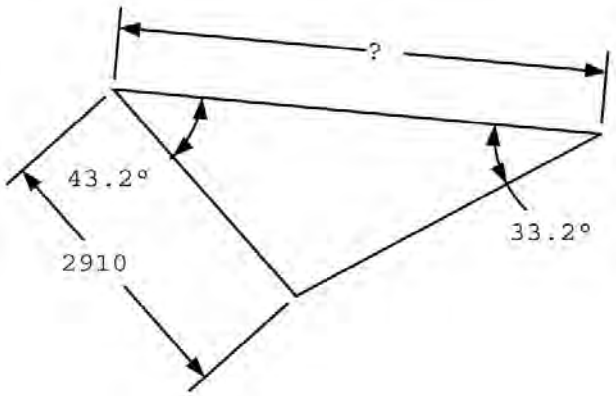
SCALENE TRIANGLE



08H-40 = _____

09G-40.

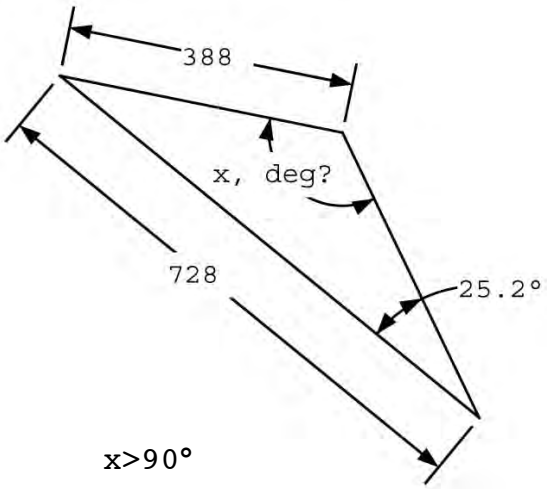
SCALENE TRIANGLE



09G-40 = _____

09H-40.

SCALENE TRIANGLE

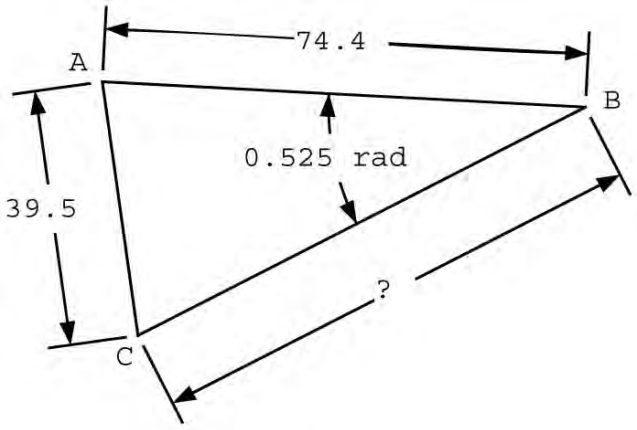


x>90°

09H-40 = _____

09I-40.

SCALENE TRIANGLE

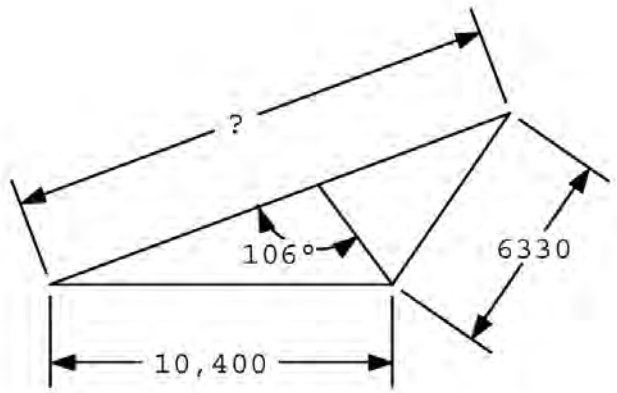


BC>AB

09I-40 = _____

05A-40.

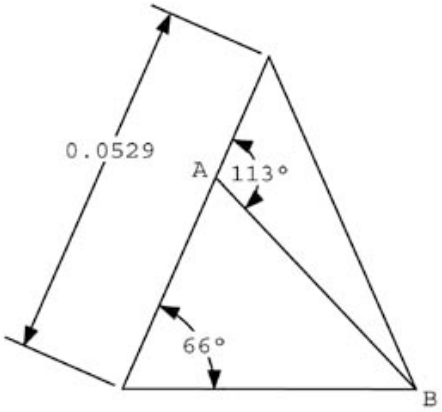
SCALENE AND ISOSCELES TRIANGLES



05A-40 = _____

05C-40.

ISOSCELES AND SCALENE TRIANGLES

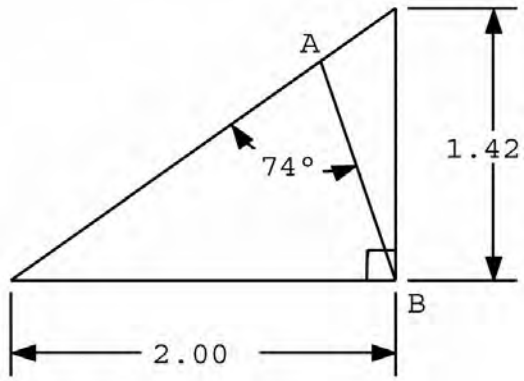


AB = ?

05C-40 = _____

05D-39.

RIGHT TRIANGLE

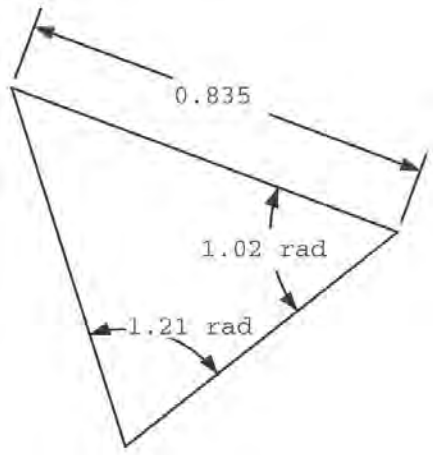


AB = ?

05D-39 = _____

06I-40.

SCALENE TRIANGLE

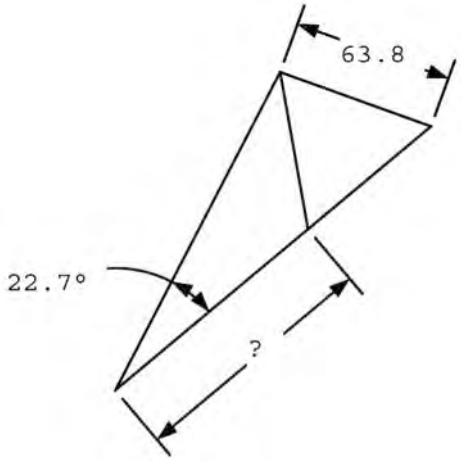


Area = ?

06I-40 = _____

07D-40.

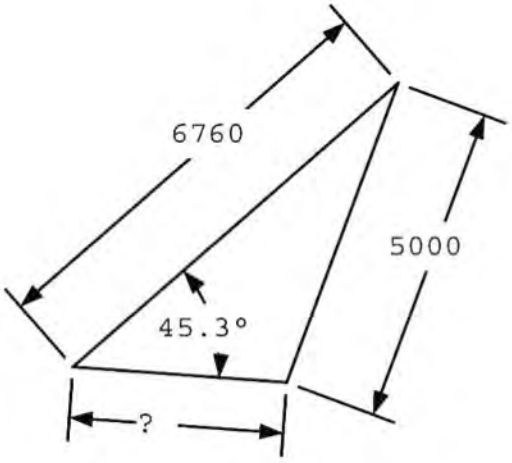
SCALENE AND EQUILATERAL TRIANGLE



07D-40 = _____

07E-40.

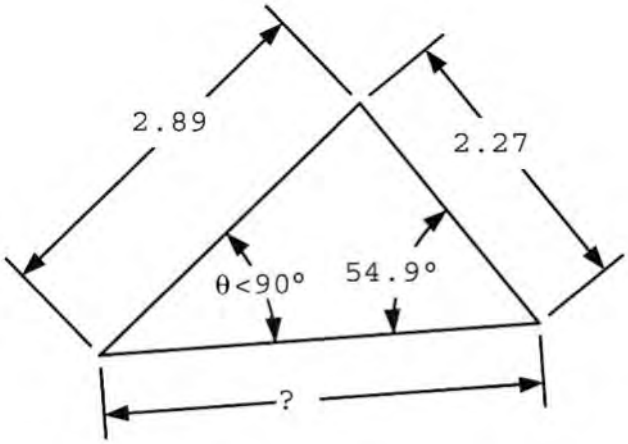
SCALENE TRIANGLE



07E-40 = _____

07I-40.

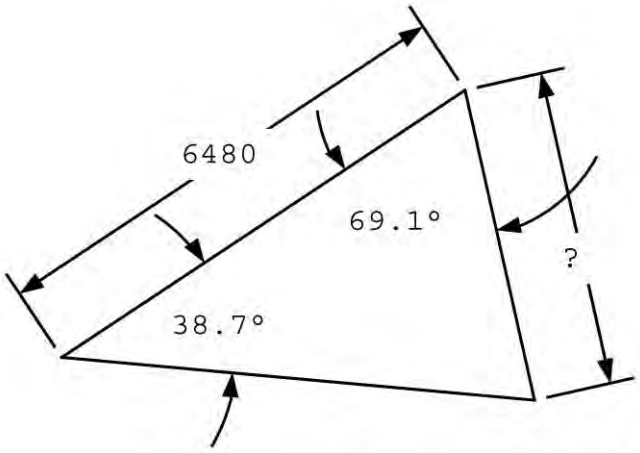
SCALENE TRIANGLE



07I-40 = _____

09A-40.

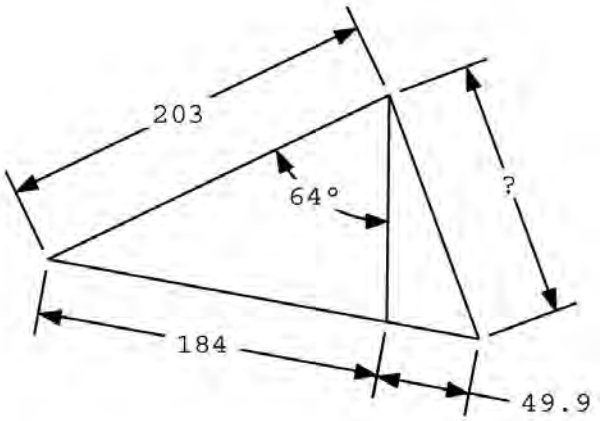
SCALENE TRIANGLE



09A-40 = _____

05G-40.

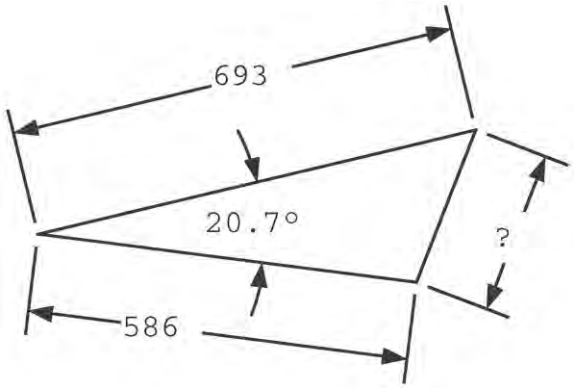
SCALENE TRIANGLES



05G-40 = _____

06B-39.

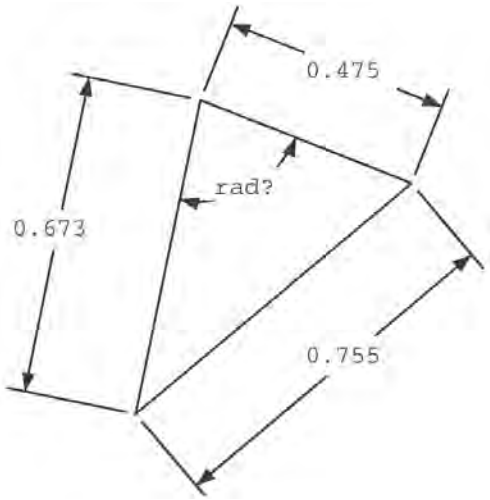
SCALENE TRIANGLE



06B-39 = _____

06C-40.

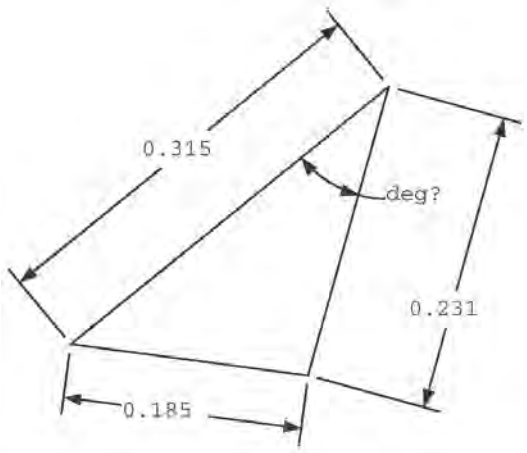
SCALENE TRIANGLE



06C-40 = _____

06E-40.

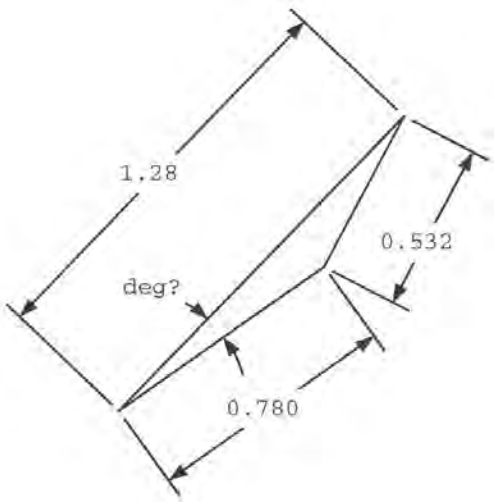
SCALENE TRIANGLE



06E-40 = _____

06F-39.

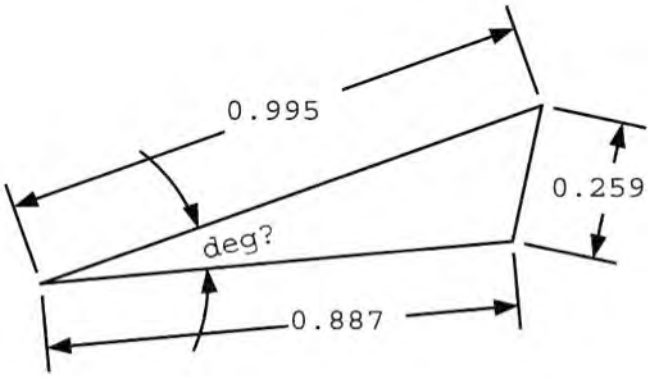
SCALENE TRIANGLE



06F-39 = _____

07B-39.

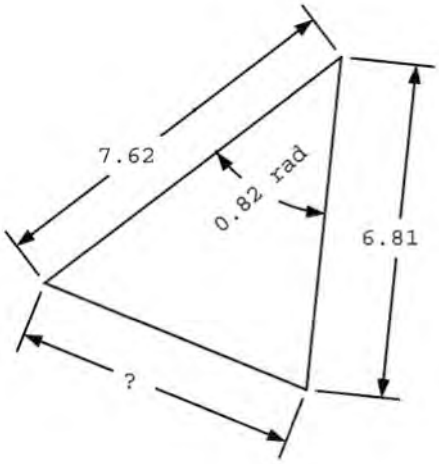
SCALENE TRIANGLE



07B-39 = _____

07C-39.

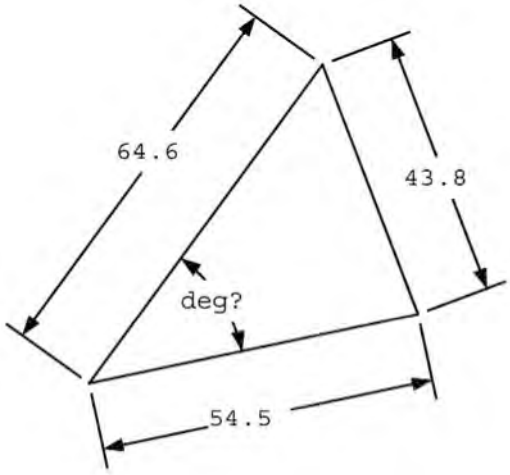
SCALENE TRIANGLE



07C-39 =

07F-39.

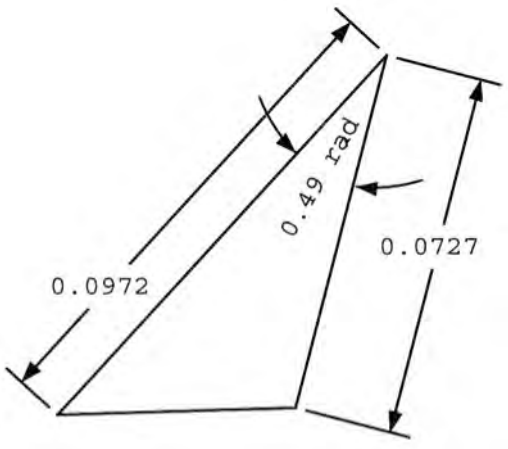
SCALENE TRIANGLE



07F-39 = _____

07G-39.

SCALENE TRIANGLE

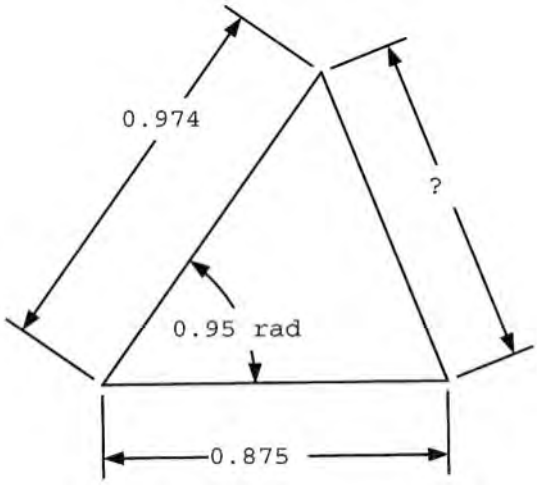


Area = ?

07G-39 = _____

07H-40.

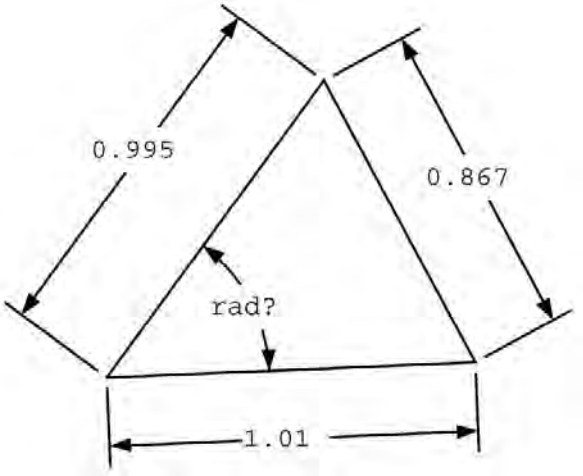
SCALENE TRIANGLE



07H-40 = _____

08C-40.

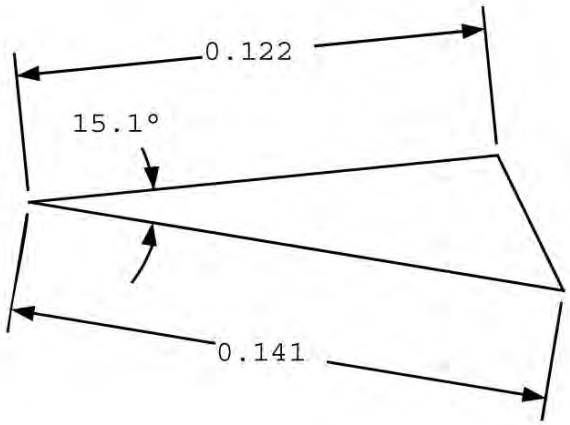
SCALENE TRIANGLE



08C-40 = _____

08F-40.

SCALENE TRIANGLE

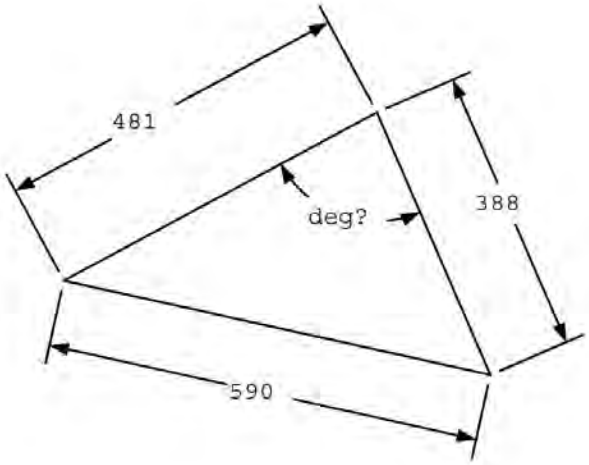


PERIMETER = ?

08F-40 = _____

08G-40.

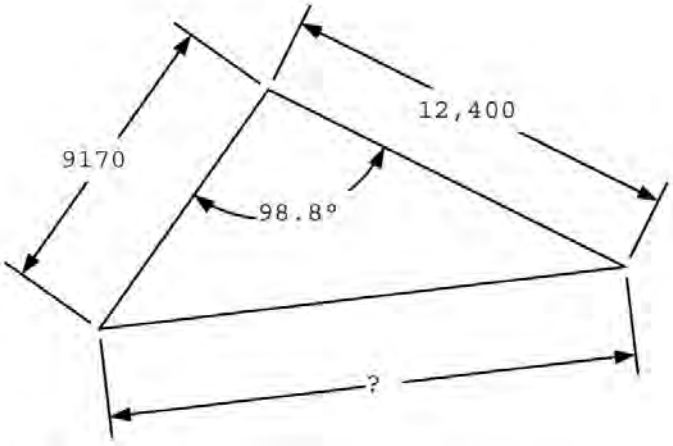
SCALENE TRIANGLE



08G-40 = _____

08I-40.

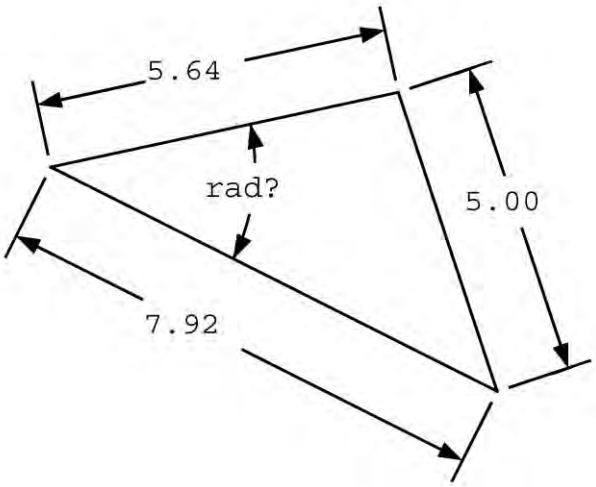
SCALENE TRIANGLE



08I-40 = _____

09B-40.

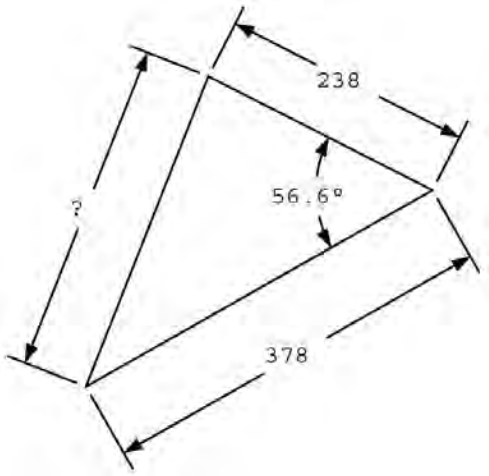
SCALENE TRIANGLE



09B-40 = _____

09F-40.

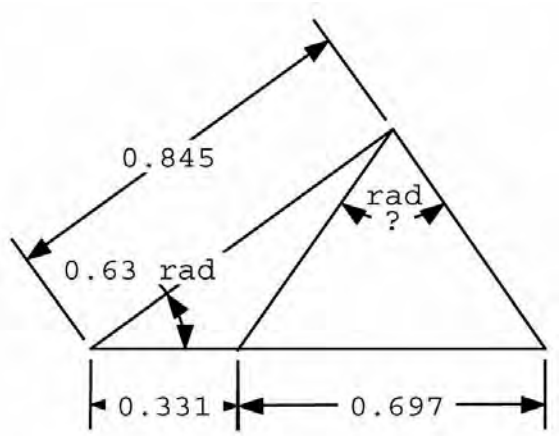
SCALENE TRIANGLE



09F-40 = _____

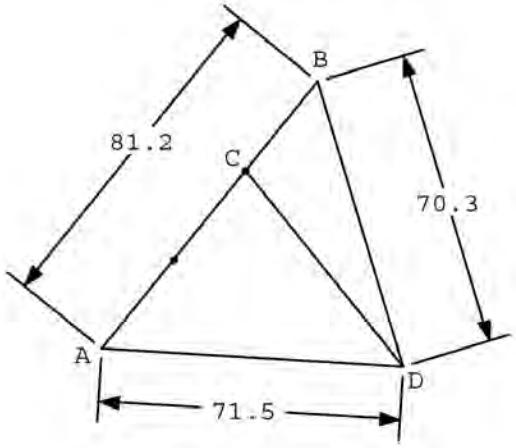
05B-39.

SCALENE TRIANGLES



05B-39 = _____

05F-40. SCALENE TRIANGLES
AB IS TRISECTED

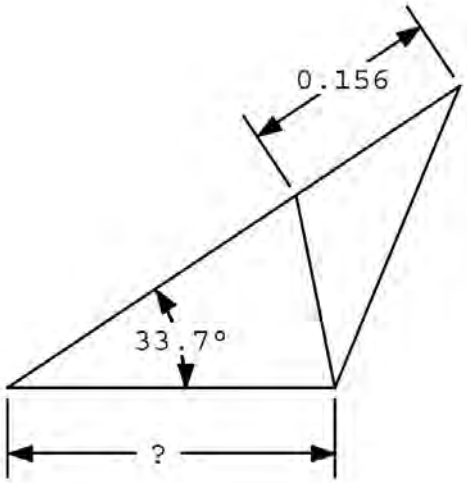


CD = ?

05F-40 = _____

05I-39.

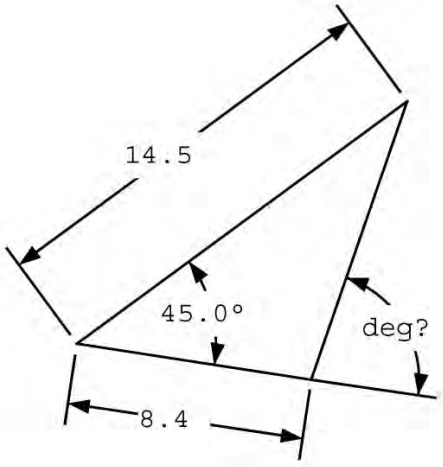
TWO ISOSCELES AND SCALENE TRIANGLES



05I-39 = _____

08B-40.

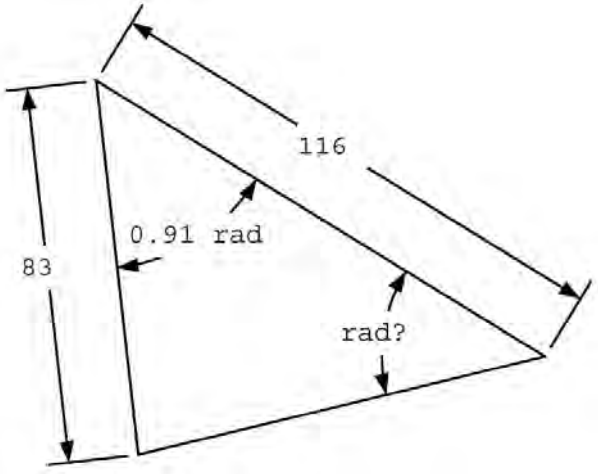
SCALENE TRIANGLE



08B-40 = _____

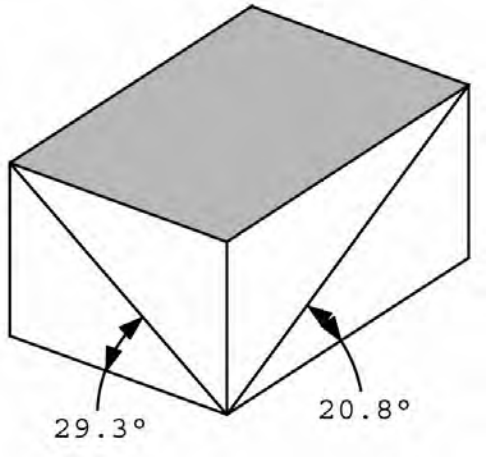
09E-40.

SCALENE TRIANGLE



09E-40 = _____

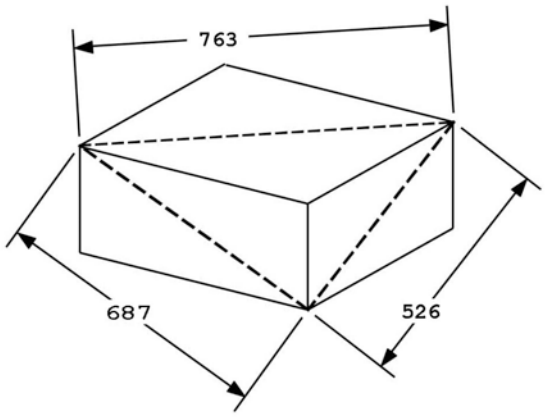
05A-49. RECTANGULAR SOLID
Shaded Area = 4630



Volume= ?

05A-49 = _____

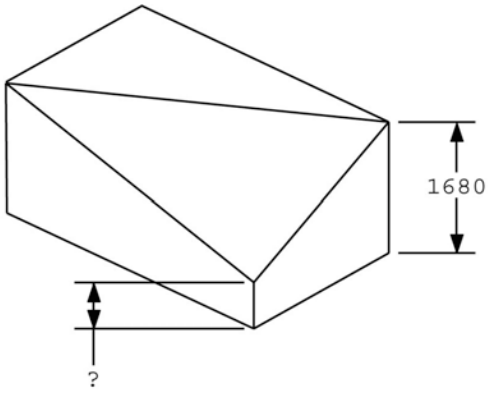
05F-50.
RECTANGULAR SOLID



Total Surface Area = ?

05F-50 = _____

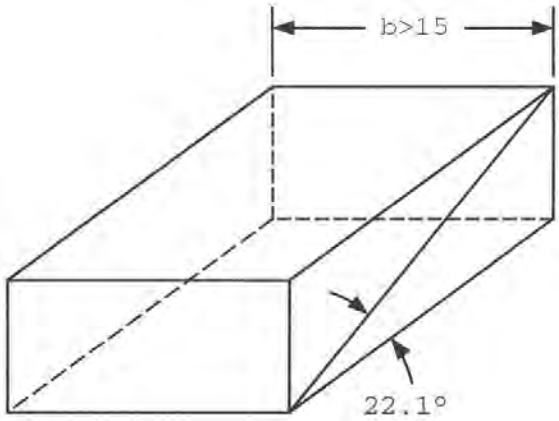
05I-49.
TRUNCATED RECTANGULAR SOLID



$$\frac{\text{Missing Corner Volume}}{\text{Total Volume}} = 0.136$$

05I-49 = _____

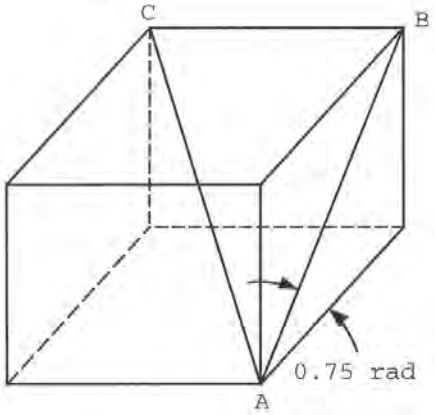
06D-50. RECTANGULAR SOLID
Volume = 3290



Total Surface Area = 1440
b = ?

06D-50 = _____

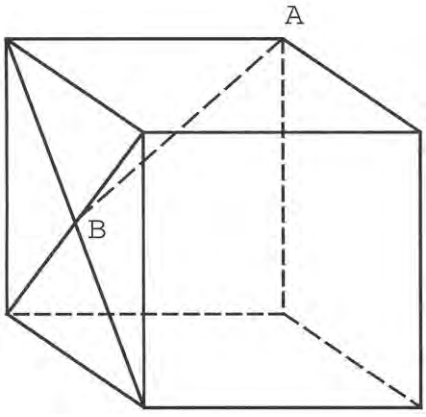
06G-49.
RECTANGULAR SOLID
AB = 45.7 AC = 60.4



Volume = ?

06G-49 = _____

06H-49.
CUBE
AB = 85.9



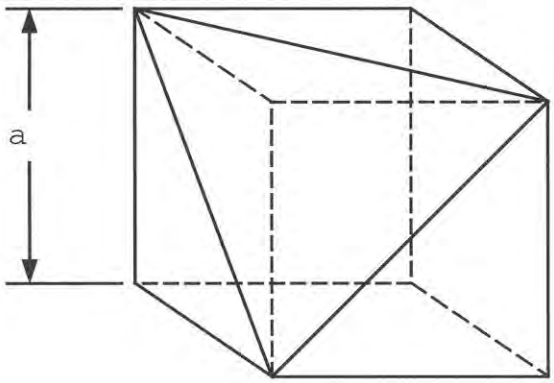
Volume = ?

06H-49 = _____

06I-49.

TRUNCATED CUBE

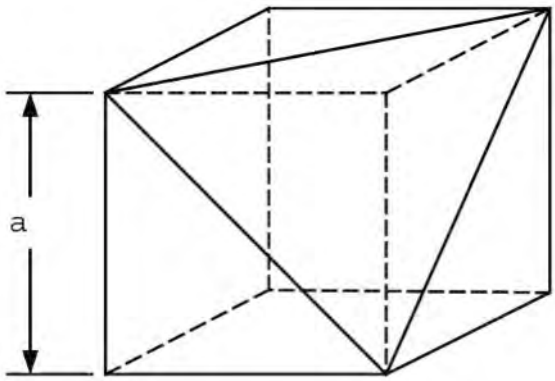
$$\frac{\text{Volume(Truncated Cube)}}{a^3} = ?$$



06I-49 = _____

07H-49.

TRUNCATED CUBE

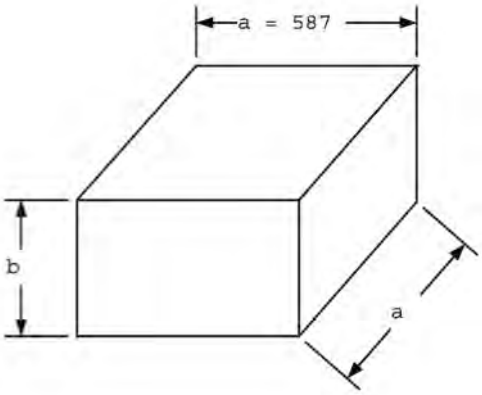


$$\frac{\text{Total Surface Area}}{a^2} = ?$$

07H-49 = _____

07I-49.

RECTANGULAR SOLID



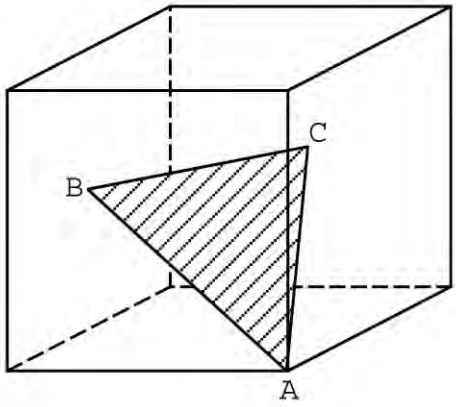
$$\frac{a}{b} = \frac{b}{a-b}$$

Volume = ?

07I-49 = _____

08D-49.

CUBE



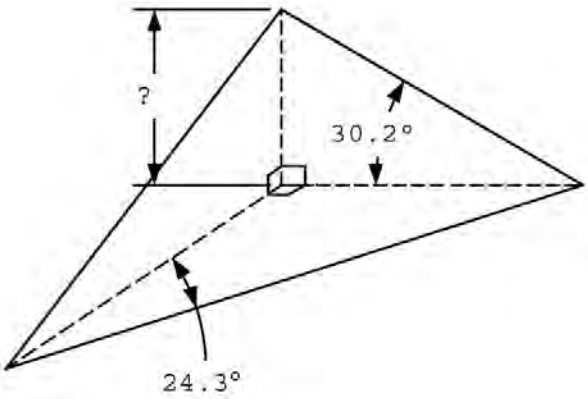
AB = 0.601 B,C = FACE CENTERS

HATCHED AREA = ?

08D-49 = _____

08F-49.

CORNER OF A CUBE

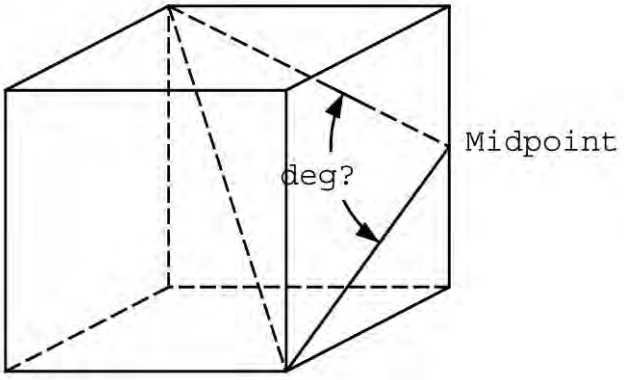


VOLUME = 123

08F-49 = _____

08I-49.

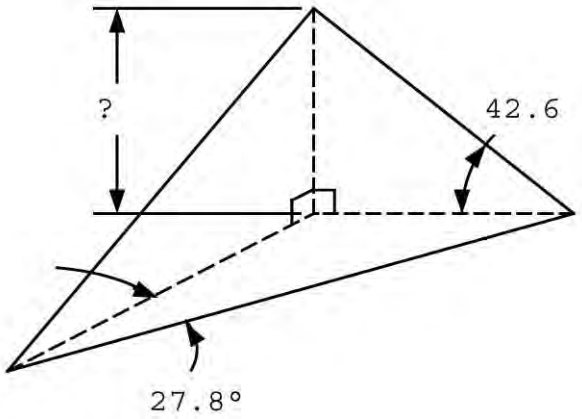
CUBE



08I-49 = _____

09E-49.

CORNER OF A CUBE

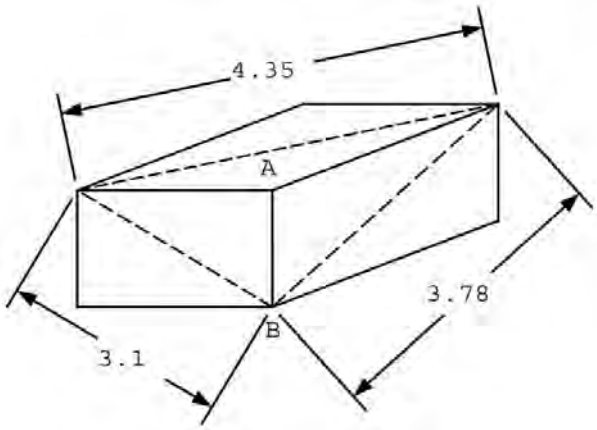


Volume = 9.43

09E-49 = _____

09E-50.

RECTANGULAR SOLID

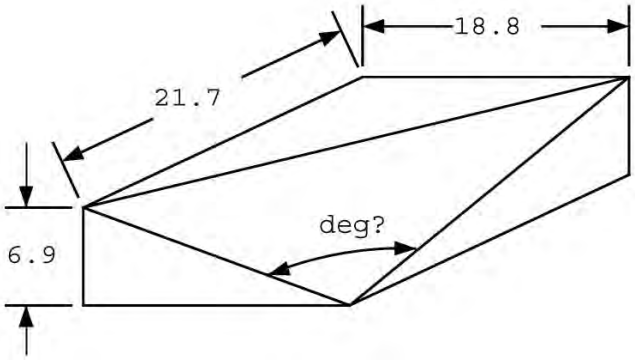


AB = ?

09E-50 = _____

09F-49.

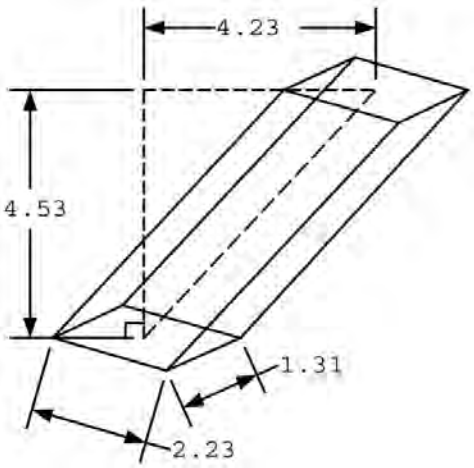
TRUNCATED RECTANGULAR SOLID



09F-49 = _____

09G-50.

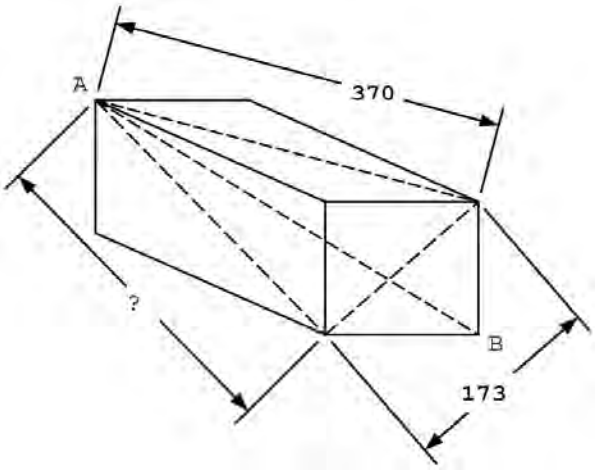
SLANT RECTANGULAR SOLID



Volume = ?

09G-50 = _____

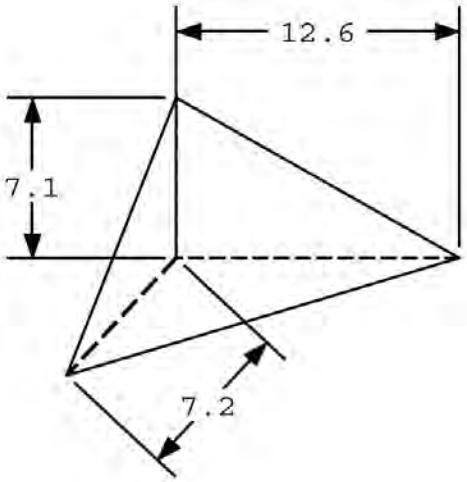
09I-49. RECTANGULAR SOLID



AB = 387

09I-49 = _____

05C-50. CORNER OF A CUBE

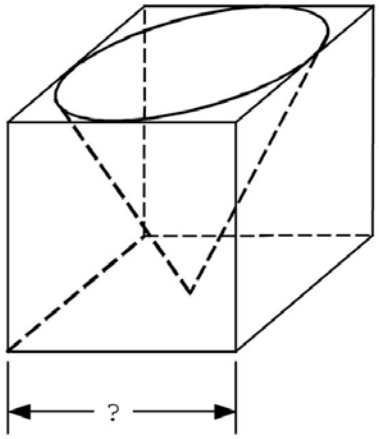


Total Surface Area = ?

05C-50 = _____

05B-50.

CUBE AND CONICAL CAVITY

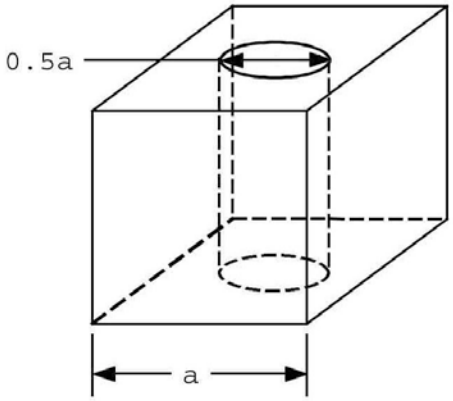


Volume = 2.43

05B-50 = _____

05D-49.

CUBE AND CYLINDRICAL CAVITY

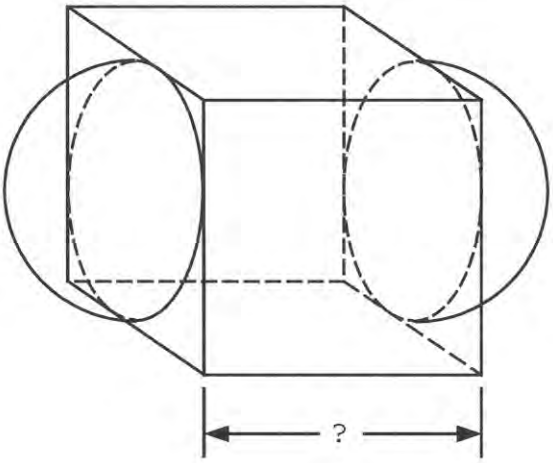


$$\frac{\text{Cylinder Lateral Surface Area}}{a^2} = ?$$

05D-49 = _____

06D-49.

CUBE AND HEMISPHERES

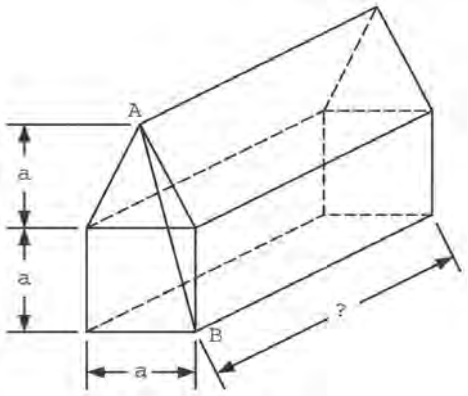


Total Surface Area = 466

06D-49 = _____

06E-50.

ISOSCELES TRIANGLE PRISM AND RECTANGULAR SOLID



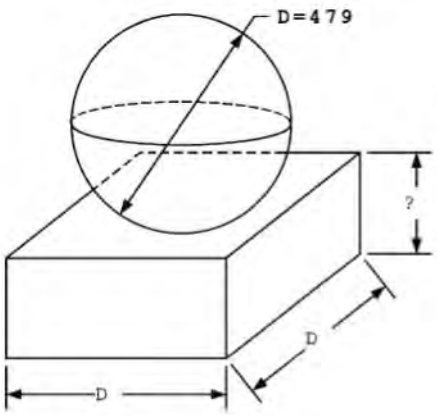
AB = 18.8

Volume = 2860

06E-50 = _____

07A-49.

SPHERE AND RECTANGULAR SOLID

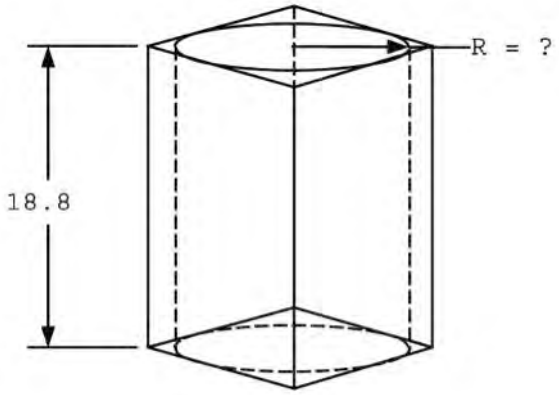


Volume(Sphere) = Volume(Rect. Solid)

07A-49 = _____

07I-50.

RECTANGULAR SOLID WITH CYLINDRICAL CAVITY

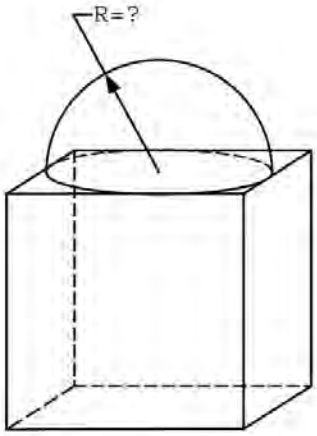


Volume = 884

07I-50 = _____

08A-50.

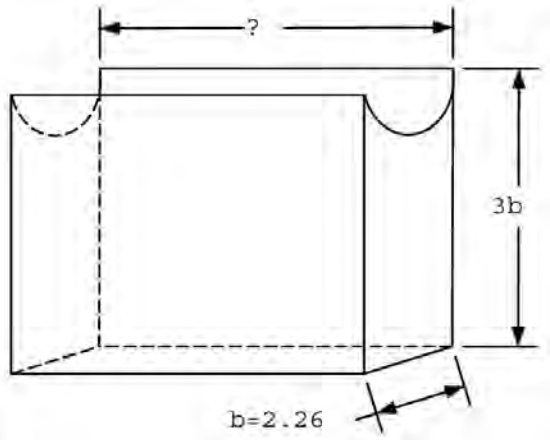
CUBE AND HEMISPHERE



TOTAL SURFACE AREA = 0.249

08A-50 = _____

08D-50. RECTANGULAR SOLID WITH SEMICIRCULAR TROUGH

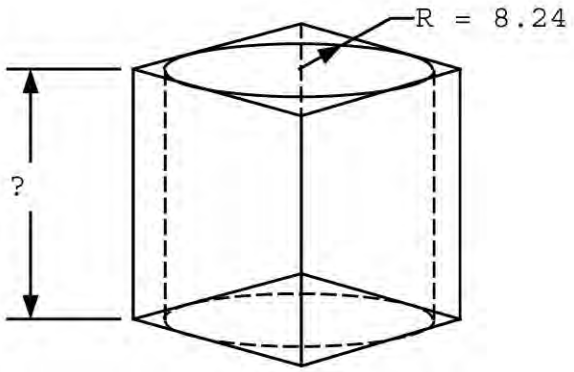


TOTAL SURFACE AREA = 194

08D-50 = _____

08I-50.

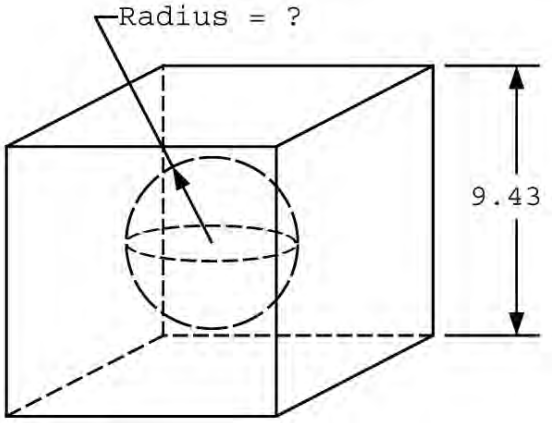
RECTANGULAR SOLID WITH CYLINDRICAL CAVITY



TOTAL SURFACE AREA = 1920

08I-50 = _____

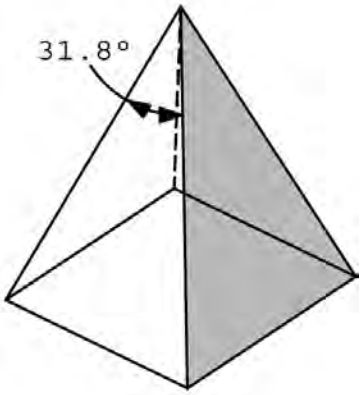
09H-49. CUBE AND SPHERE



$$\frac{\text{CUBE VOLUME}}{} - \frac{\text{SPHERE VOLUME}}{} = 725$$

09H-49 = _____

05B-49. SQUARE PYRAMID

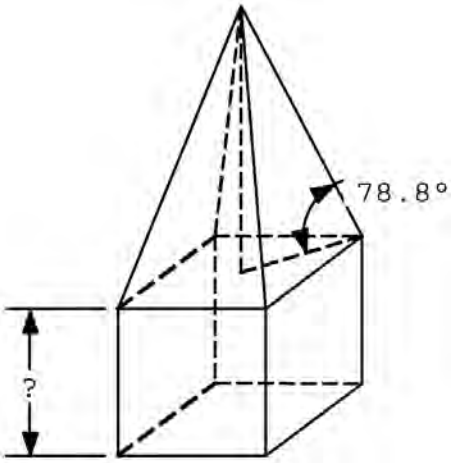


$$\frac{\text{Shaded Area}}{\text{Base Area}} = ?$$

05B-49 = _____

05G-50.

CUBE AND RIGHT SQUARE PYRAMID

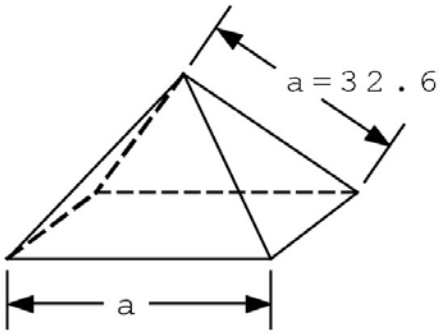


Total Surface Area = 0.0895

05G-50 = _____

05H-49.

SQUARE PYRAMID

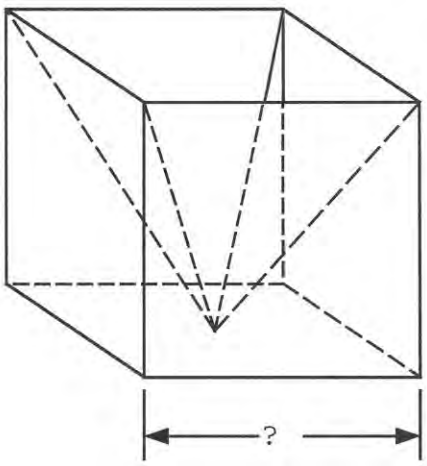


$$\frac{\text{Volume}}{\text{Total Surface Area}} = ?$$

05H-49 = _____

06A-50.

CUBE WITH SQUARE PYRAMID CAVITY

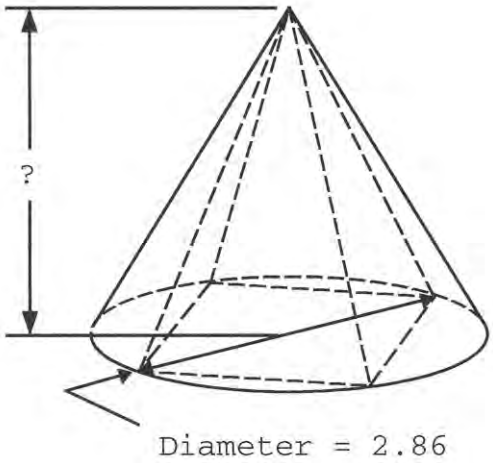


Total Surface Area = 2150

06A-50 = _____

06C-50.

CONE WITH SQUARE PYRAMIDAL CAVITY



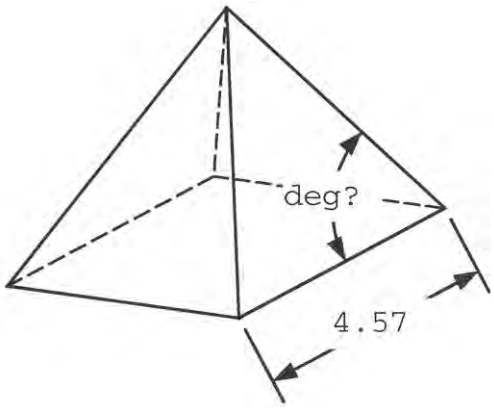
Volume = 2.42

06C-50 = _____

06I-50.

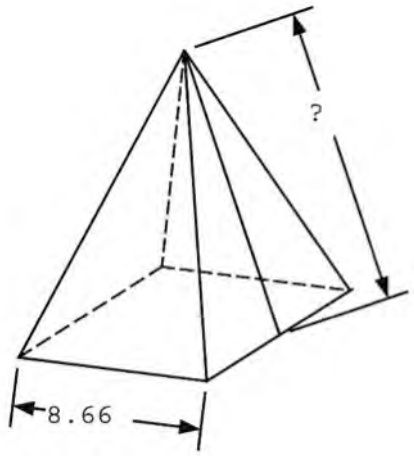
SQUARE PYRAMID

Volume = 32.6



06I-50 = _____

07B-49. SQUARE PYRAMID

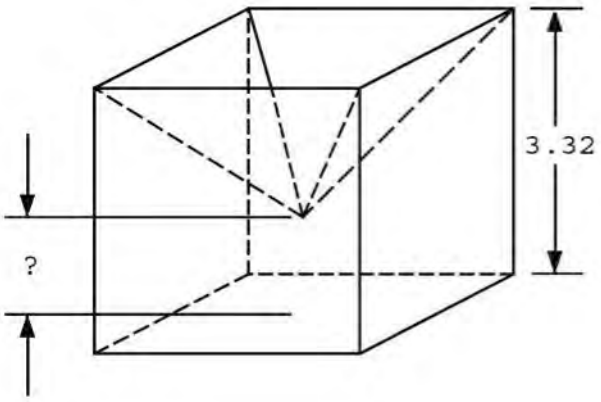


Volume = 309

07B-49 = _____

07C-50.

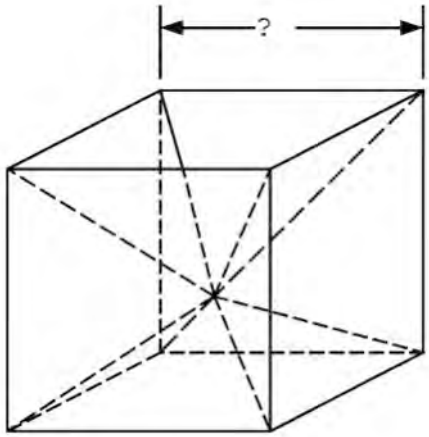
CUBE WITH PYRAMIDAL CAVITY



Volume = 30.4

07C-50 = _____

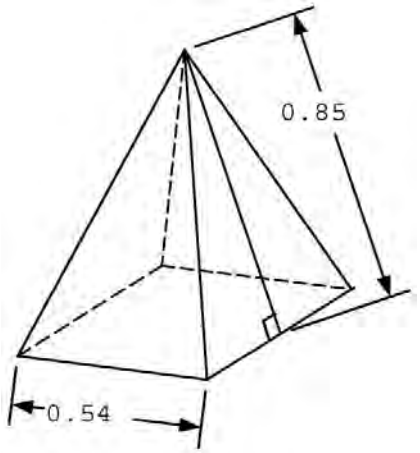
07D-50.
CUBE WITH TWO PYRAMIDAL CAVITIES



Volume = 303

07D-50 = _____

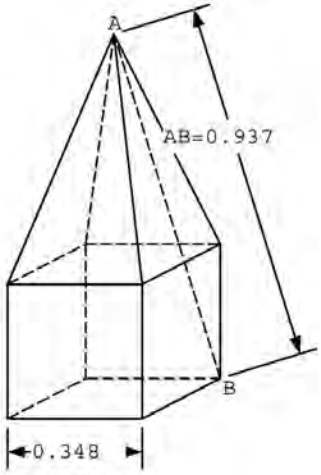
08B-49.
SQUARE PYRAMID



TOTAL SURFACE AREA = ?

08B-49 = _____

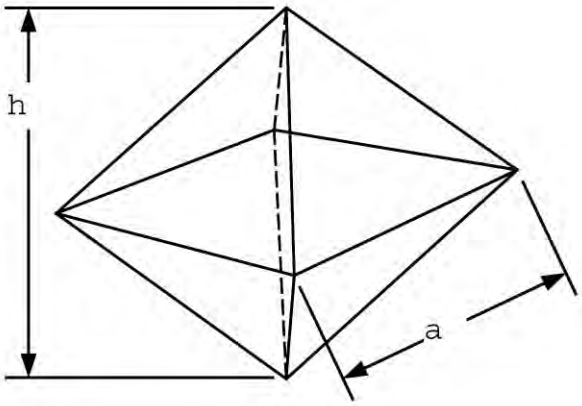
08C-49. CUBE AND SQUARE PYRAMID



VOLUME(PYRAMID) = ?

08C-49 = _____

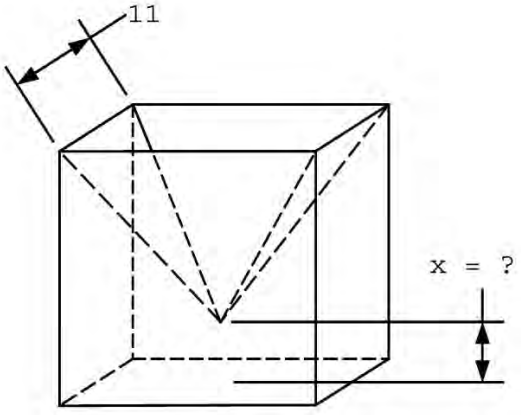
08E-49.
TWO SQUARE PYRAMIDS MADE FROM EIGHT EQUILATERAL TRIANGLES



h/a = ?

08E-49 = _____

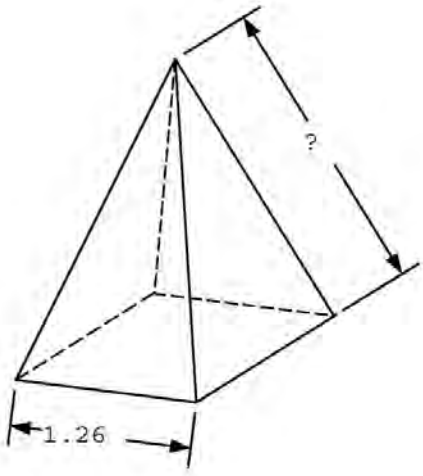
09B-49.
CUBE WITH PYRAMIDAL CAVITY



Volume = 1000

09B-49 = _____

09B-50. SQUARE PYRAMID

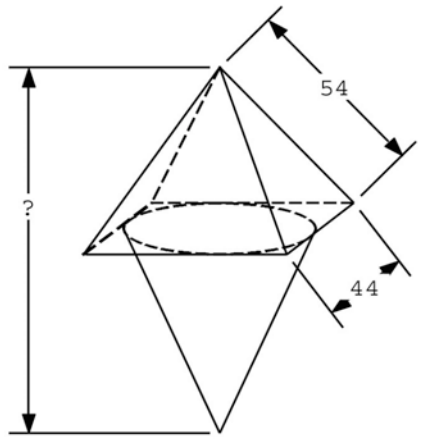


Total Surface Area = 6.87

09B-50 = _____

05F-49.

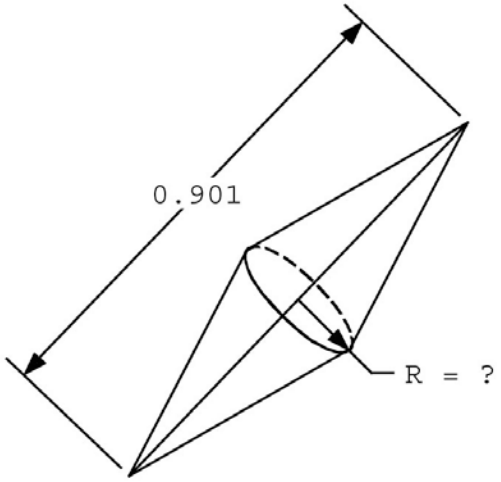
CONE AND SQUARE PYRAMID



Cone Volume = Pyramid Volume

05F-49 = _____

05A-50. CONES

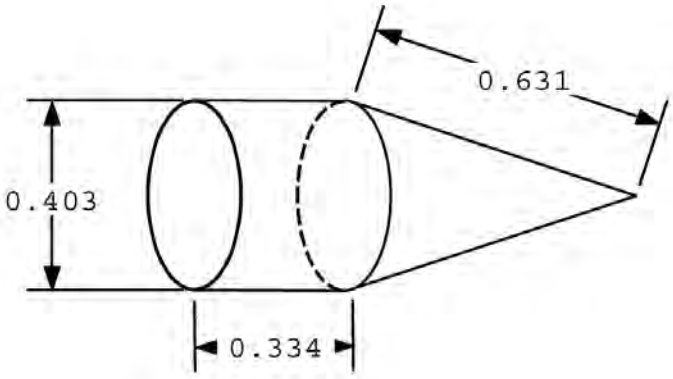


Total Volume = 0.0166

05A-50 = _____

05C-49.

CLYINDER AND CONE

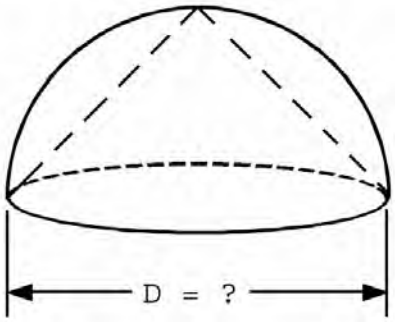


Total Volume = ?

05C-49 = _____

05D-50.

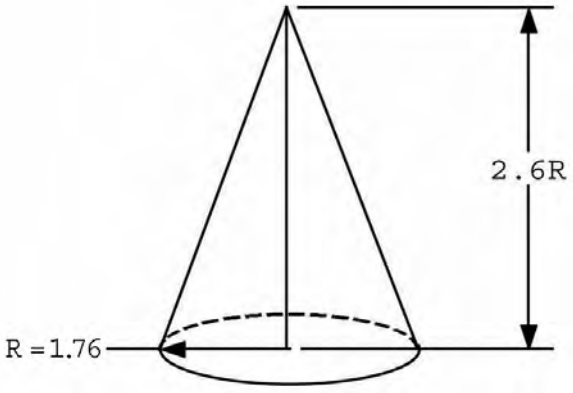
HEMISPHERE AND CONICAL CAVITY



Volume = 7.14

05D-50 = _____

05E-49. CONE

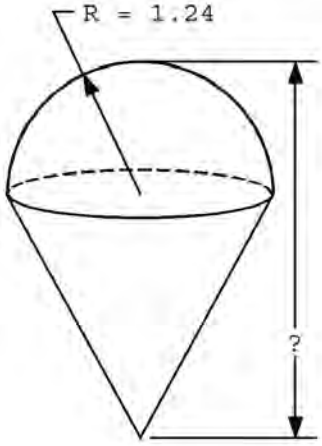


$$\frac{\text{Volume}}{\text{Total Surface Area}} = ?$$

05E-49 = _____

05H-50.

HEMISPHERE AND CONE

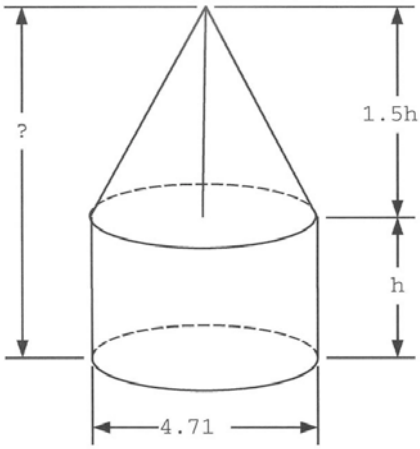


Total Surface Area = 19.9

05H-50 = _____

06A-49.

CYLINDER AND CONE



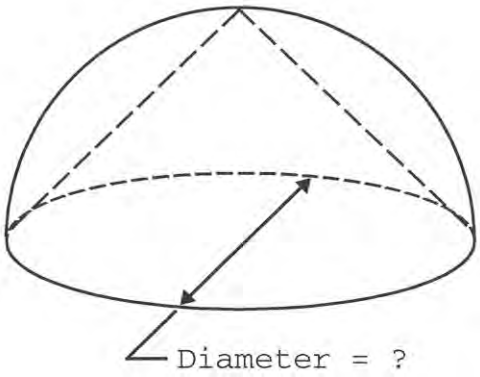
Total Volume = 74.2

06A-49 = _____

06F-49.

HEMISPHERE AND CONE

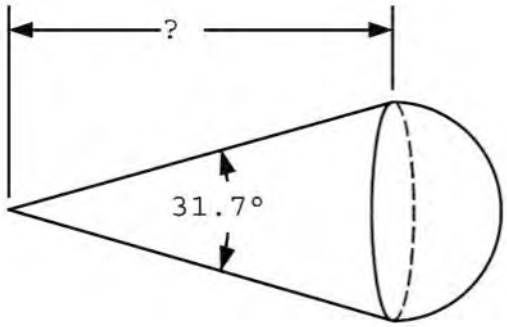
Volume(Hemisphere)–
Volume(Cone)=0.285



06F-49 = _____

07C-49.

CONE AND HEMISPHERE

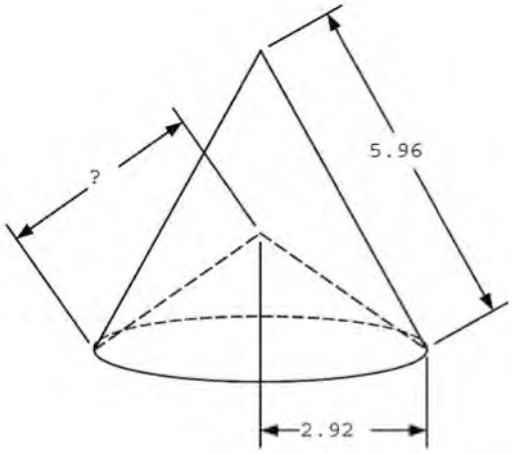


Total Volume = 8.26

07C-49 = _____

07D-49.

CONE WITH CONICAL CAVITY

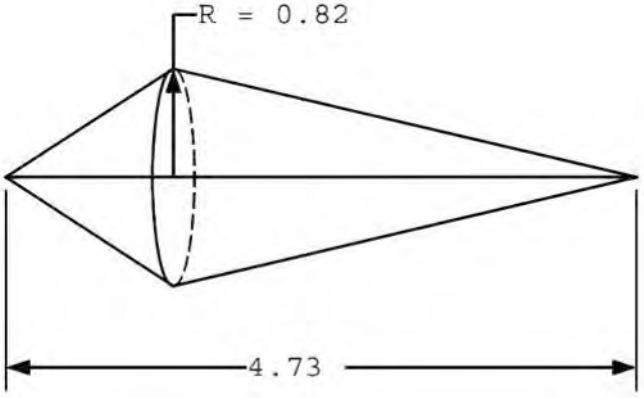


Total Surface Area = 87.2

07D-49 = _____

07E-49.

CONES

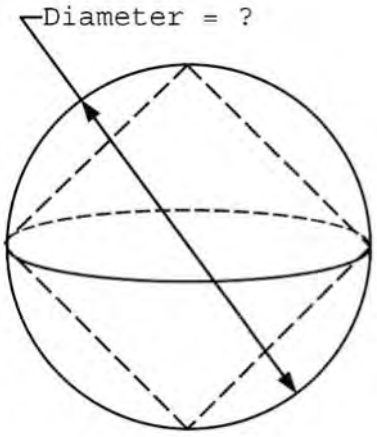


Total Volume = ?

07E-49 = _____

07H-50.

SPHERE AND CONES

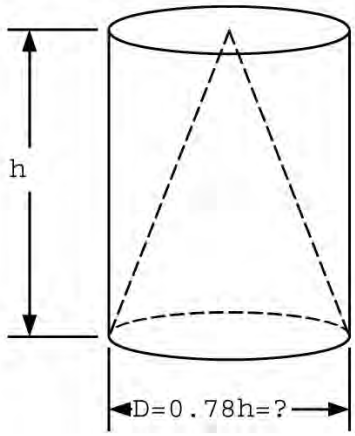


Volume(Sphere)-Volume(Cones) = 1760

07H-50 = _____

08A-49.

CYLINDER WITH CONICAL CAVITY

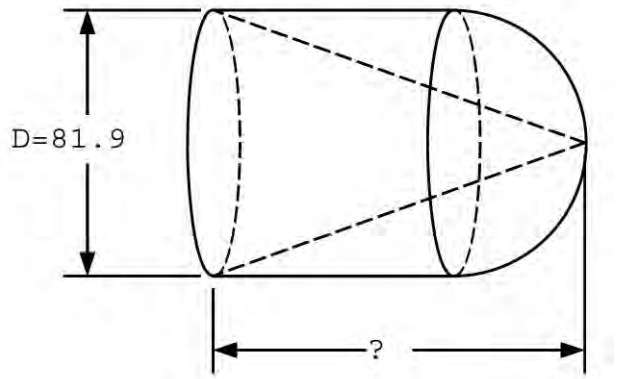


VOLUME = 5.84

08A-49 = _____

08C-50.

CYLINDER AND HEMISPHERE WITH CONICAL CAVITY

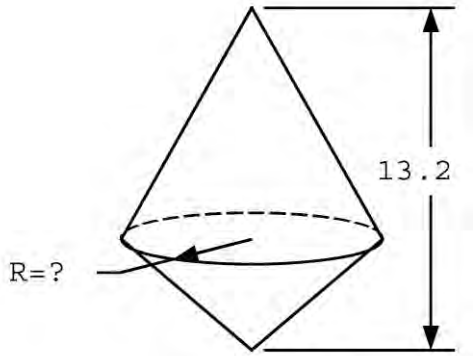


VOLUME = 474,000

08C-50 = _____

08F-50.

CONES

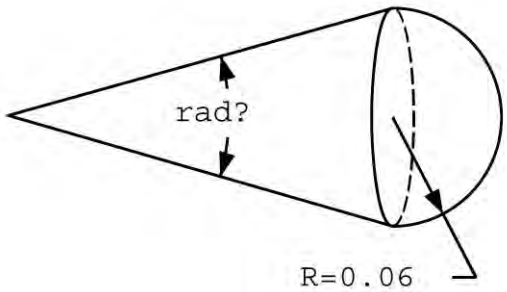


TOTAL VOLUME = 352

08F-50 = _____

08G-50.

CONE AND HEMISPHERE

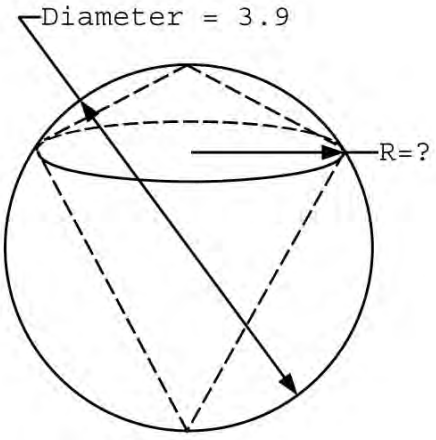


TOTAL VOLUME = 0.0013

08G-50 = _____

08H-49.

SPHERE AND CONES



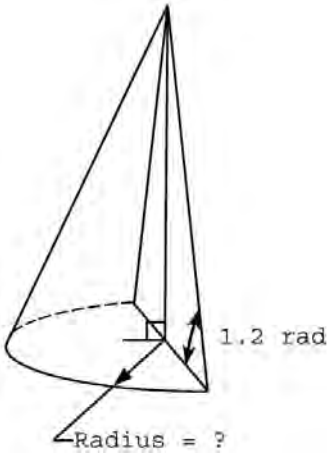
VOLUME(SPHERE)-VOLUME(CONES) = 20.3

08H-49 = _____

09A-49.

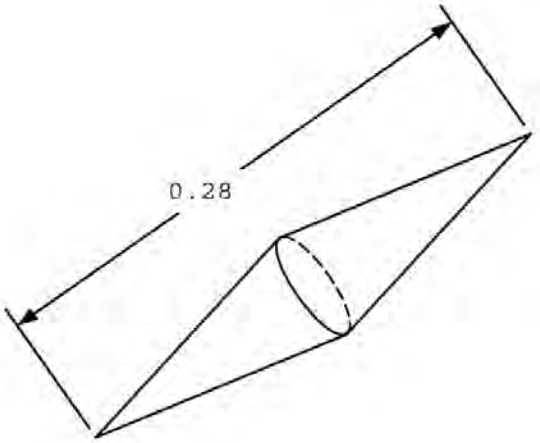
HALF CONE

Volume = 46.7



09A-49 = _____

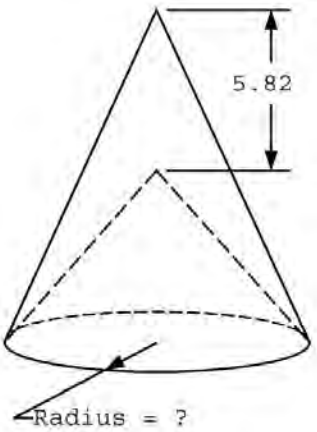
09A-50. IDENTICAL CONES



Total Surface Area = 0.028
Total Volume = ?

09A-50 = _____

09H-50.
CONE WITH CONICAL CAVITY

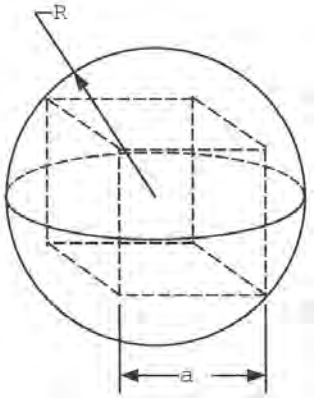


Volume = 200

09H-50 = _____

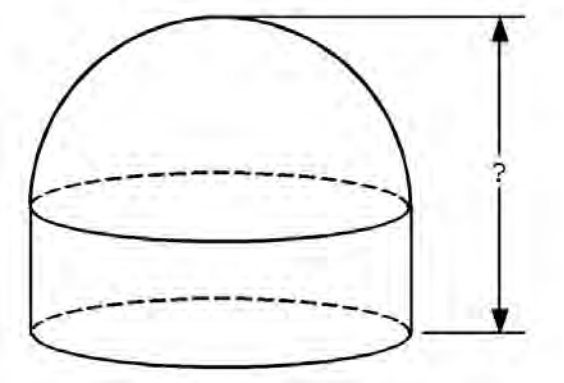
06C-49.
SPHERE AND INSCRIBED CUBE

$\frac{a}{R}$ = ?



06C-49 = _____

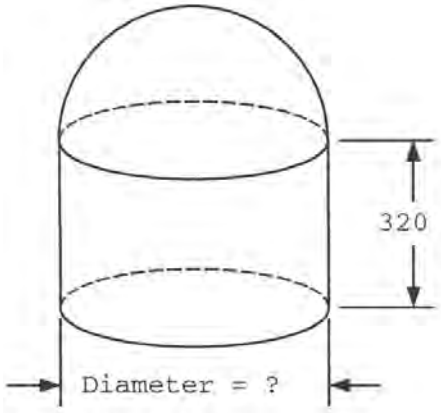
05E-50. CYLINDER AND HEMISPHERE



$\frac{\text{Hemisphere Volume}}{\text{Cylinder Volume}}$ = 0.73

05E-50 = _____

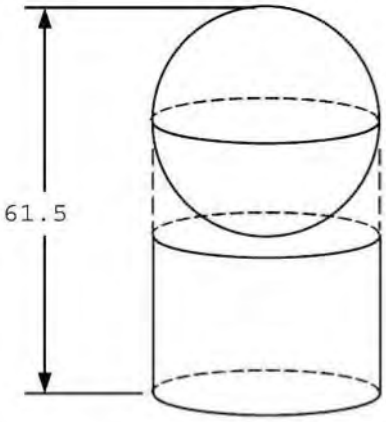
06B-49.
CYLINDER AND HEMISPHERE



Total Surface Area = 1,140,000

06B-49 = _____

07E-50.
CYLINDER AND SPHERE



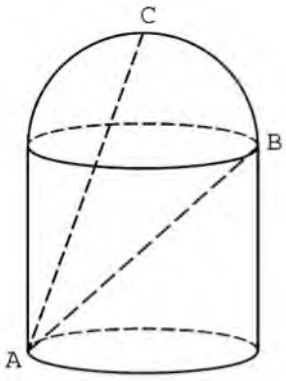
Volume(Cylinder) = Volume(Sphere)=?

07E-50 = _____

07F-50.

HEMISPHERE AND CYLINDER

Volume(Hemisphere) = 69,200



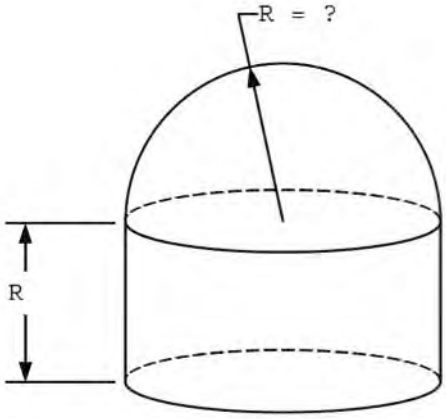
AB = 86.5

AC = ?

07F-50 = _____

07G-49.

HEMISPHERE AND CYLINDER

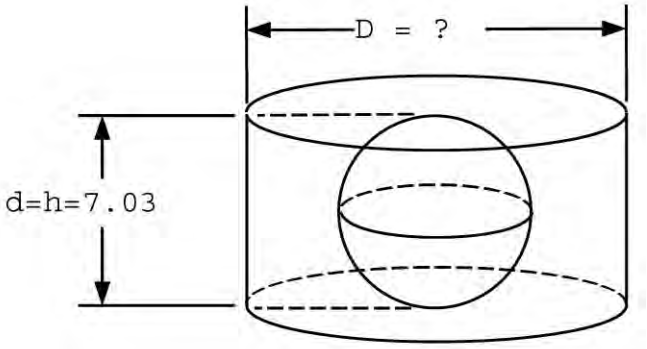


Total Surface Area = 5080

07G-49 = _____

08B-50.

CYLINDER AND SPHERE

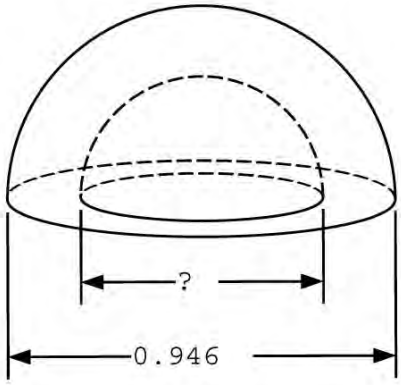


VOLUME(CYLINDER)—VOLUME(SPHERE) = 870

08B-50 = _____

08E-50.

HEMISPHERE WITH HEMISPHERICAL CAVITY

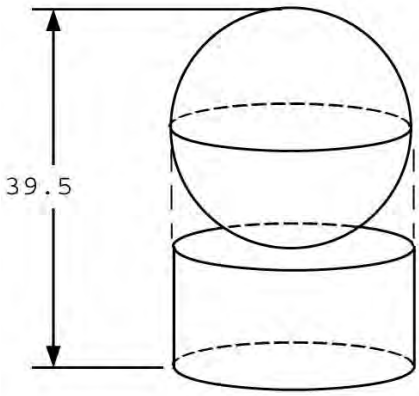


TOTAL SURFACE AREA = 2.39

08E-50 = _____

08H-50.

SPHERE AND CYLINDER

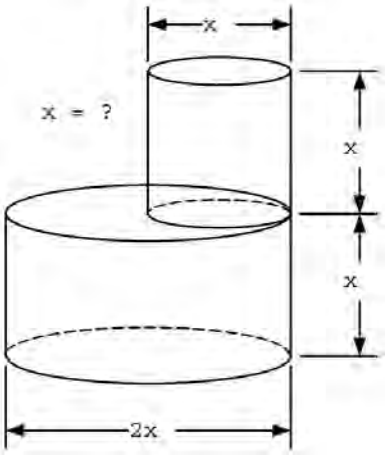


TOTAL SURFACE AREA(SPHERE) = TOTAL SURFACE AREA(CYLINDER) = ?

08H-50 = _____

09G-49.

CYLINDERS



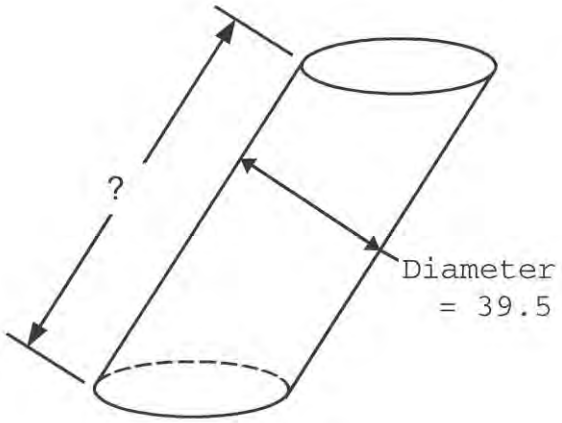
Total Surface Area = 6250

09G-49 = _____

06F-50.

SLANT CIRCULAR CYLINDER

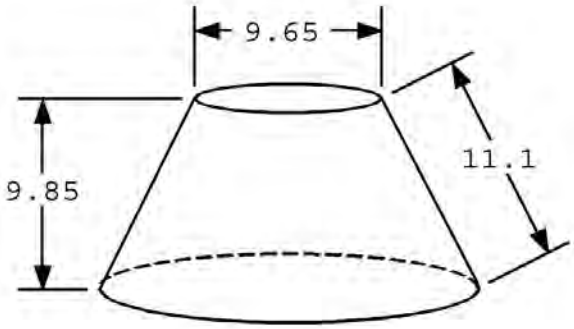
Volume = 112,000



06F-50 = _____

05G-49.

FRUSTUM

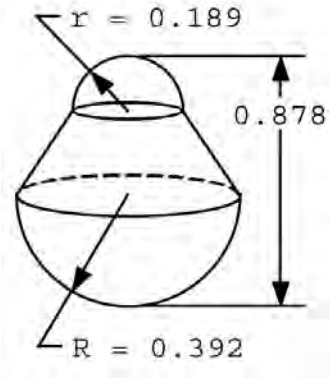


Total Surface Area = ?

05G-49 = _____

05I-50.

HEMISPHERES AND FRUSTUM



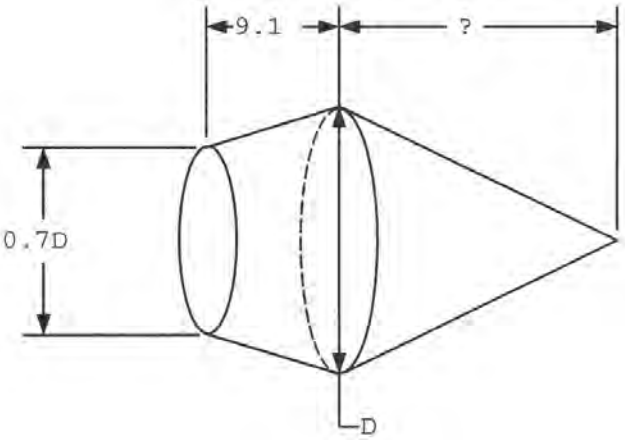
Total Volume = ?

05I-50 = _____

06B-50.

FRUSTUM AND CONE

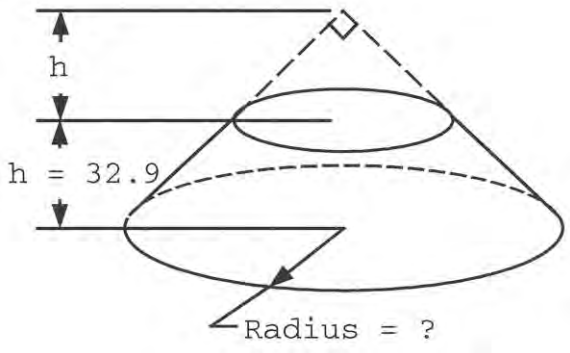
Volume(Frustum) = Volume(Cone)



06B-50 = _____

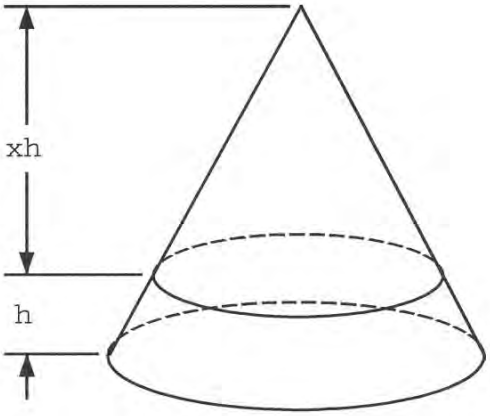
06E-49.

FRUSTUM



06E-49 = _____

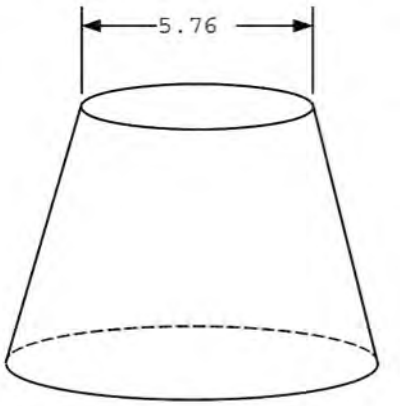
06H-50. FRUSTUM AND SMALL CONE



Volume(Small Cone) =
Volume(Frustum)
x = ?

06H-50 = _____

07A-50. FRUSTUM

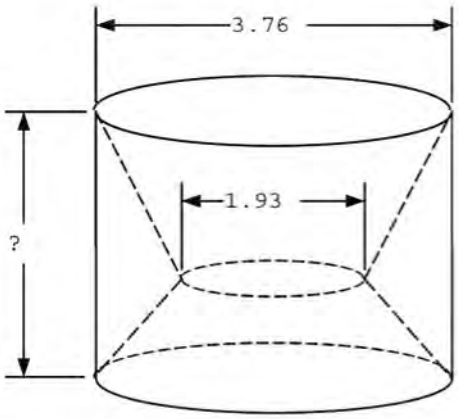


Total Surface Area = 244
Lateral Surface Area = 152
Volume = ?

07A-50 = _____

07F-49.

CYLINDER AND FRUSTUMS

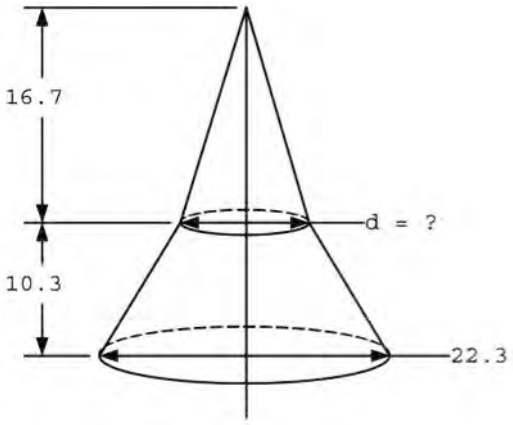


Volume(Both Frustums) = 18.3

07F-49 = _____

07G-50.

CONE AND FRUSTUM

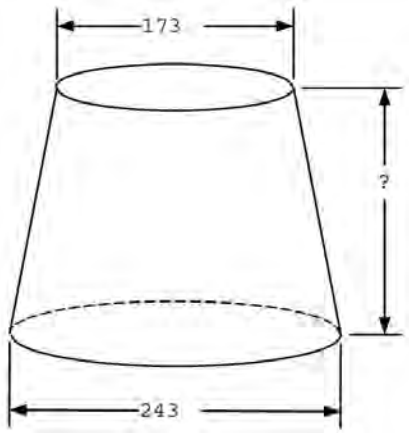


Total Volume = 2650

07G-50 = _____

08G-49.

FRUSTUM

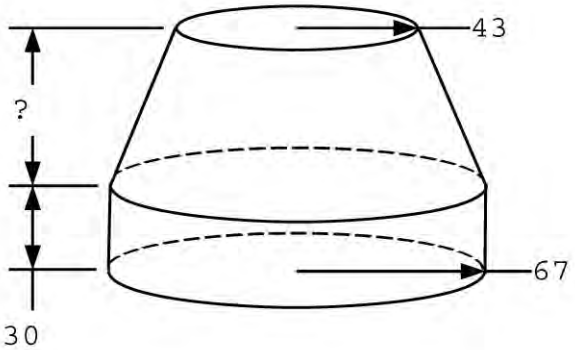


TOTAL SURFACE AREA = 190,000

08G-49 = _____

09F-50.

CYLINDER AND FRUSTUM

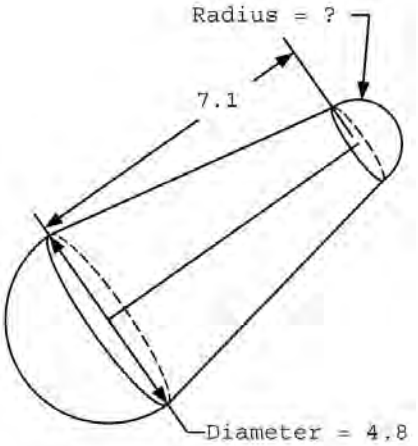


Cylinder Total Surface Area = Frustum Total Surface Area

09F-50 = _____

09I-50.

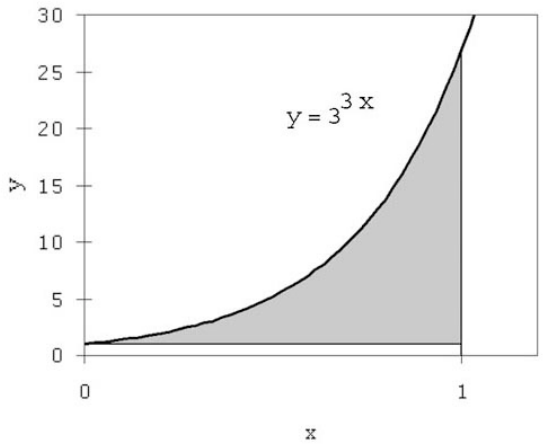
HEMISPHERES AND FRUSTUM



Total Volume = 100

09I-50 = _____

05A-59.

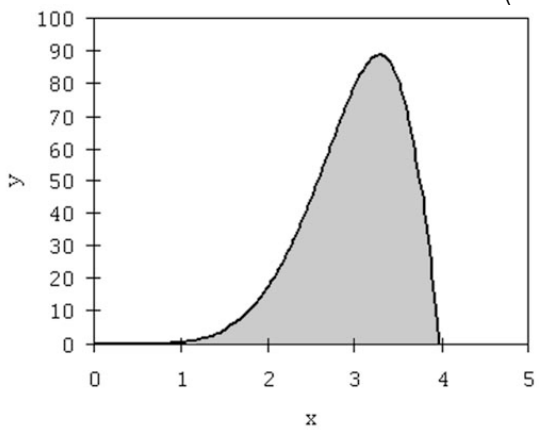


Shaded Area = ?

05A-59 = _____

05D-59. RADIANS

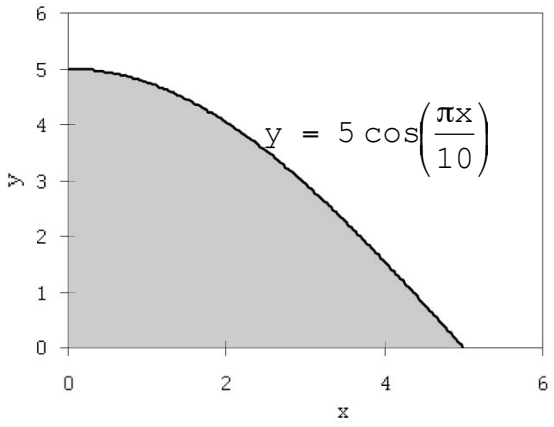
$y = 3x^3 \sin(0.2x^2)$



Shaded Area = ?

05D-59 = _____

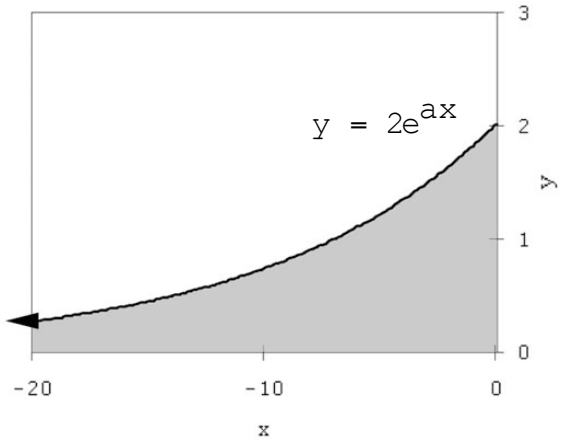
05G-59. RADIANS



Shaded Area = ?

05G-59 = _____

05H-59.

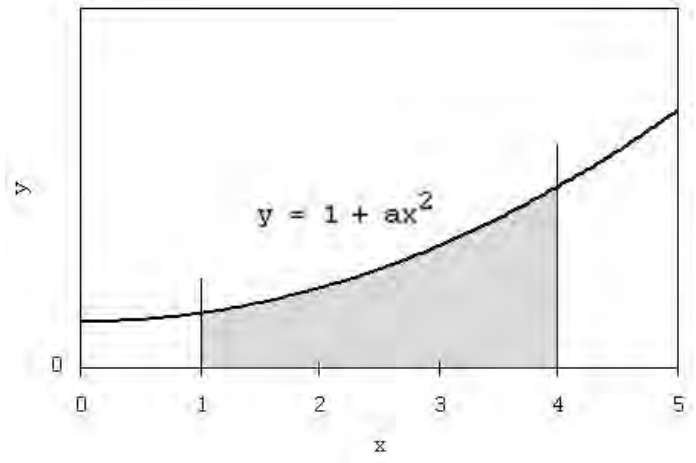


Shaded Area = 20

a = ?

05H-59 = _____

06C-59. a = ?

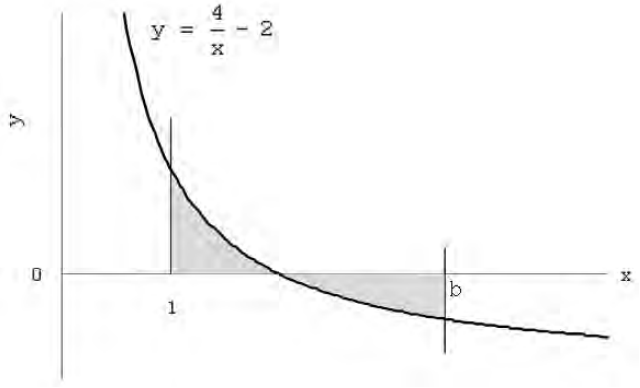


Shaded Area = 7

06C-59 = _____

06D-59.

Shaded Area above x axis =
Shaded Area below x axis

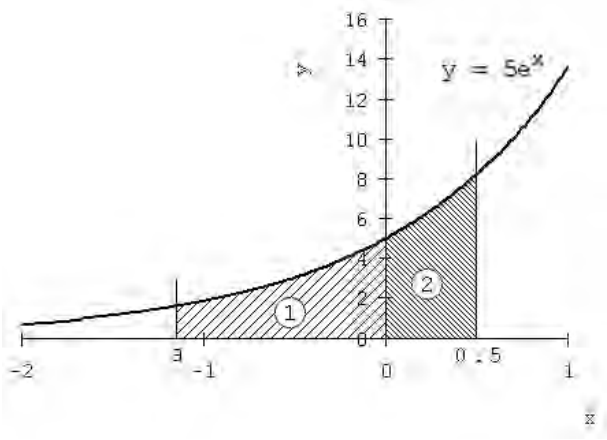


b = ?

06D-59 = _____

06F-59.

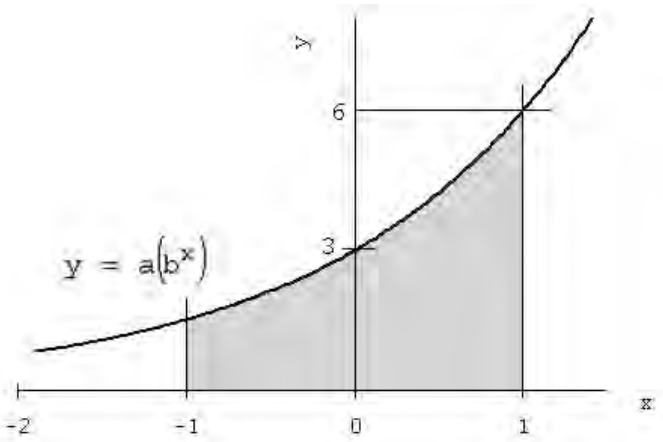
a = ?



Area 1 = Area 2

06F-59 = _____

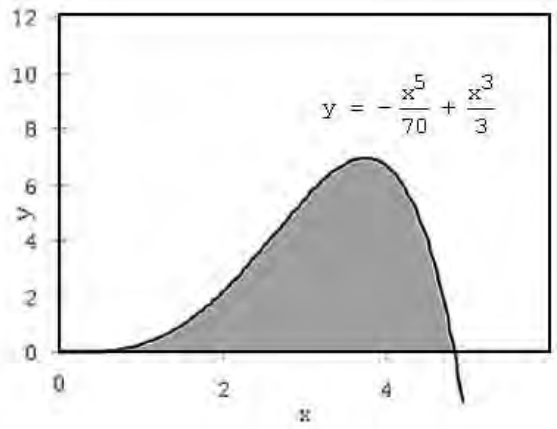
06I-59.



Shaded Area = ?

06I-59 = _____

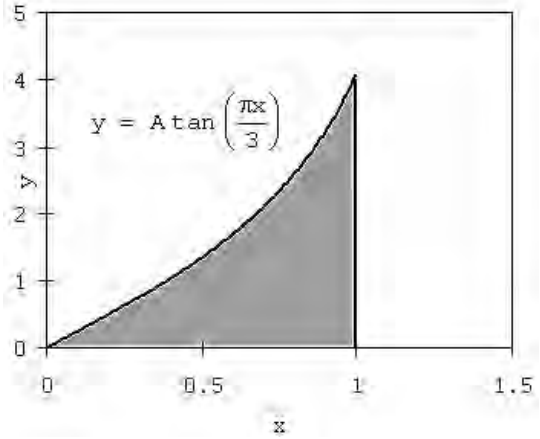
07A-59.



Shaded Area = ?

07A-59 = _____

07D-59. RADIANS

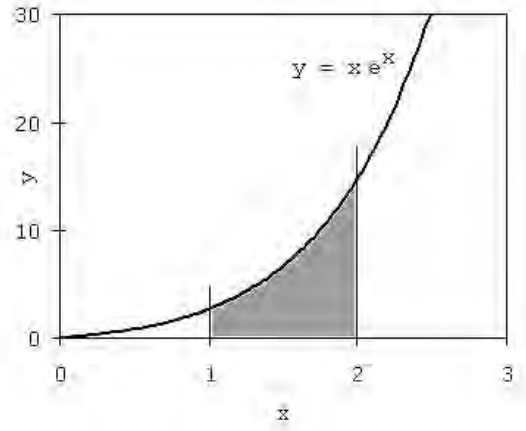


Shaded Area = 2.26

y(1)≠4 A = ?

07D-59 = _____

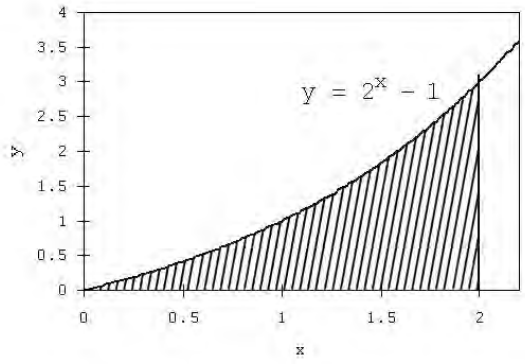
07F-59.



Shaded Area = ?

07F-59 = _____

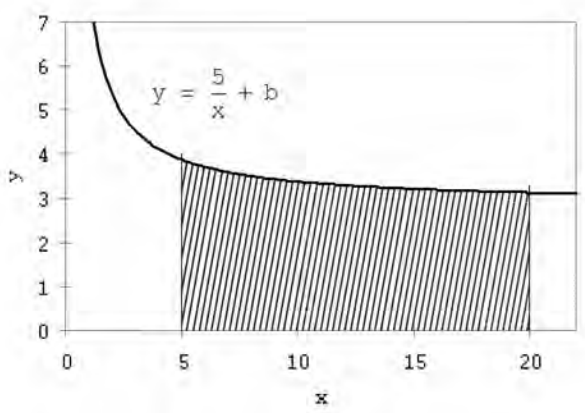
08C-59.



HATCHED AREA = ?

08C-59 = _____

08E-59.

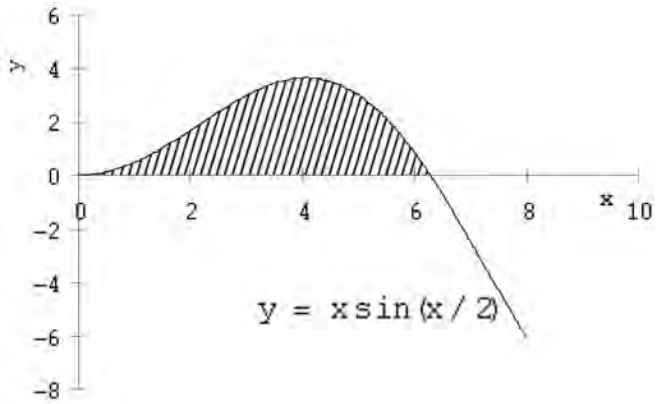


HATCHED AREA = 50
b = ?

08E-59 = _____

09G-59.

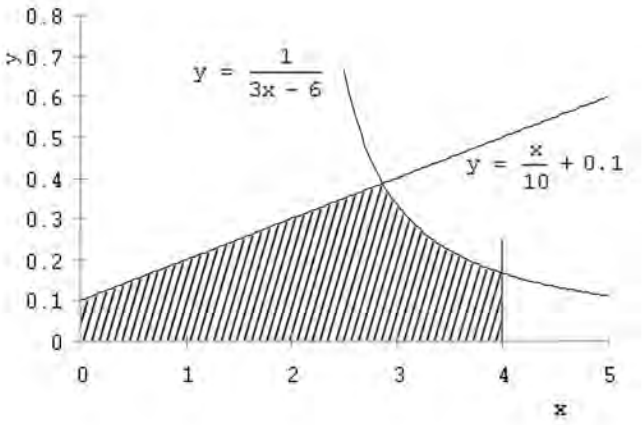
RADIANS



Area = ?

09G-59 = _____

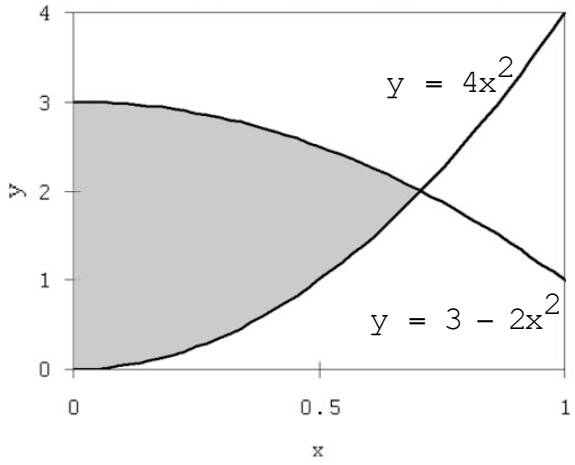
09H-59.



Hatched Area = ?

09H-59 = _____

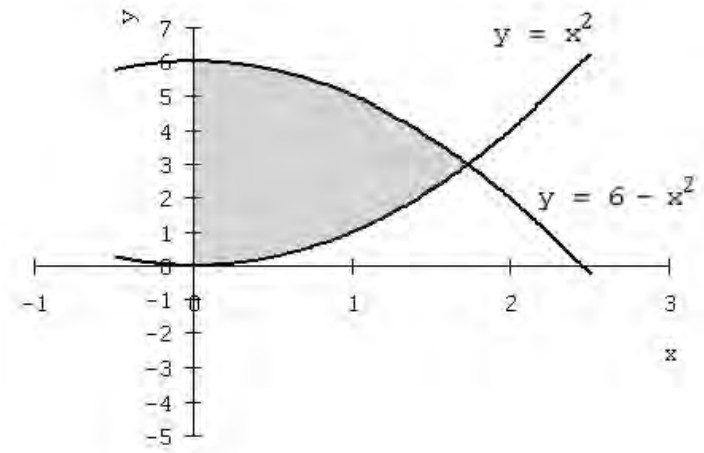
05E-59.



Shaded Area = ?

05E-59 = _____

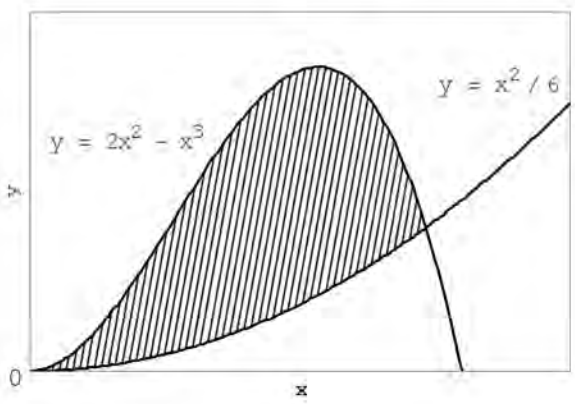
06E-59.



Shaded Area = ?

06E-59 = _____

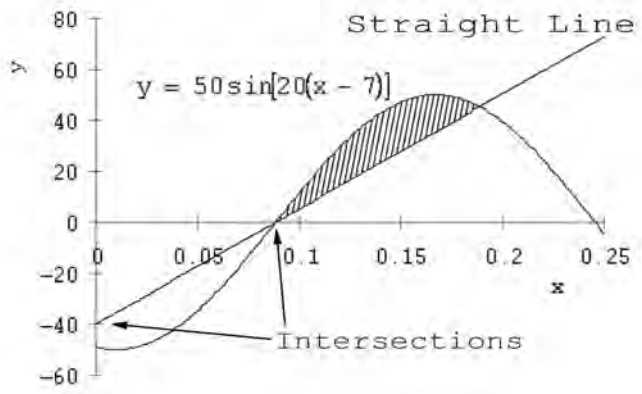
08G-59.



HATCHED AREA = ?

08G-59 = _____

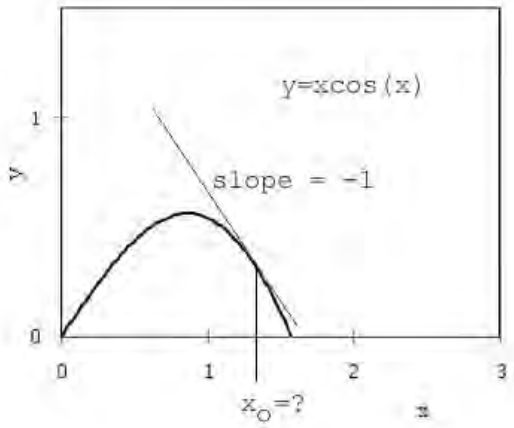
09E-59. RADIANS



Hatched Area = ?

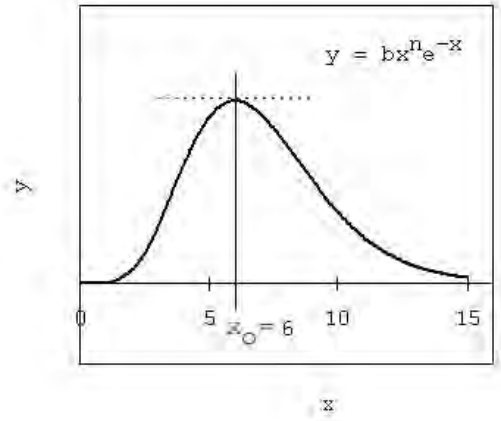
09E-59 = _____

07E-59. RADIANS



07E-59 = _____

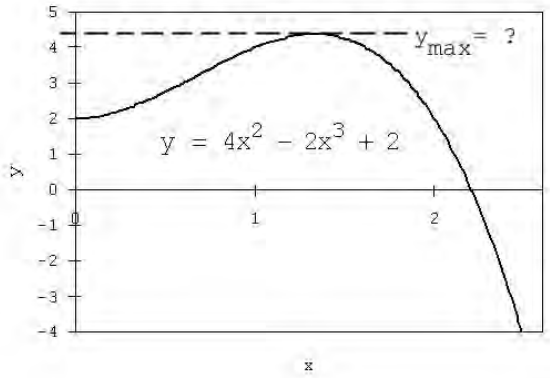
07H-59.



n = ?

07H-59 = _____

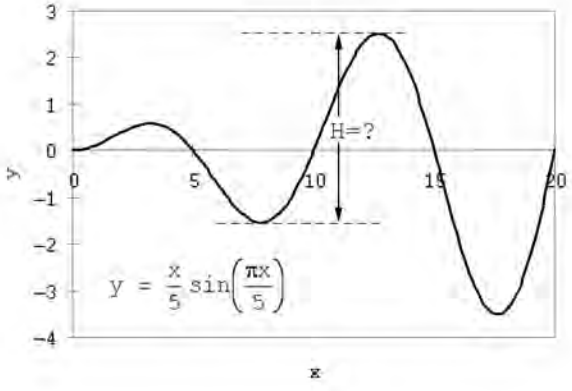
08B-59.



08B-59 = _____

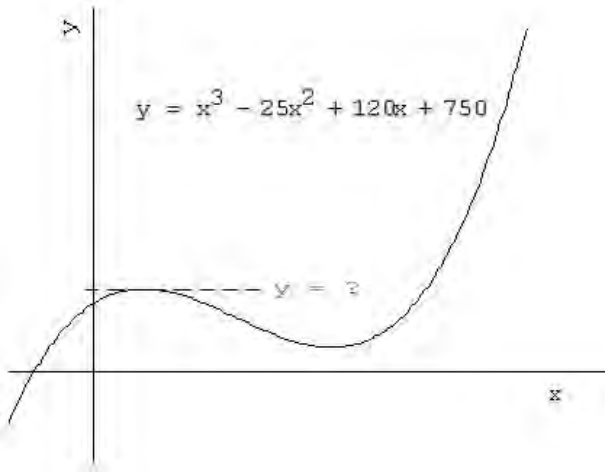
08H-59.

RADIANS



08H-59 = _____

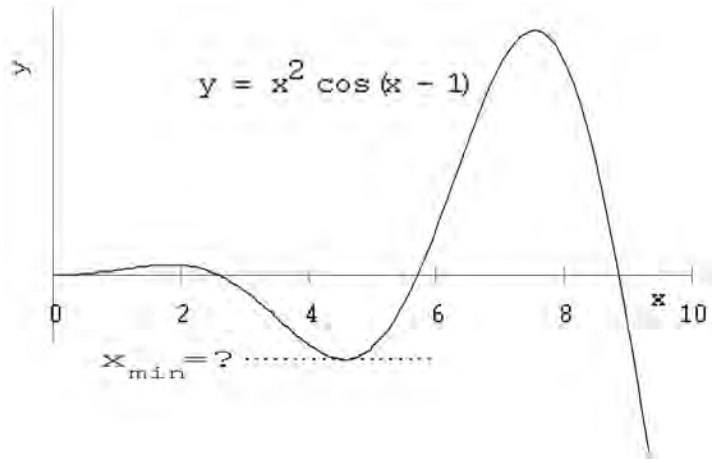
09A-59.



09A-59 = _____

09F-59.

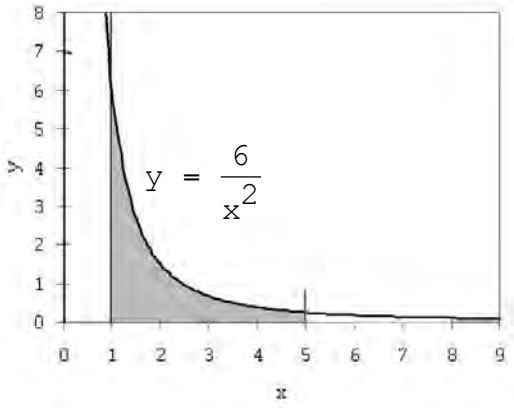
RADIANS



09F-59 = _____

05B-59.

SOLID OF REVOLUTION
(Axis of Revolution: x = 0)

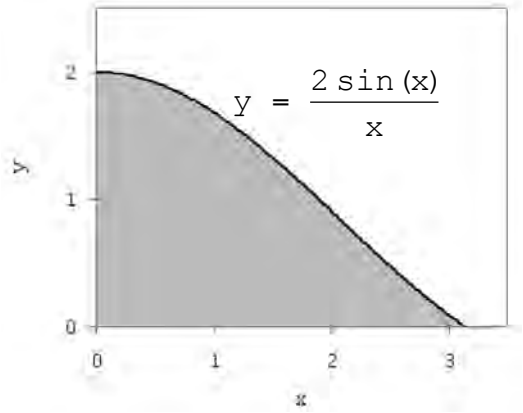


Volume = ?

05B-59 = _____

05C-59.

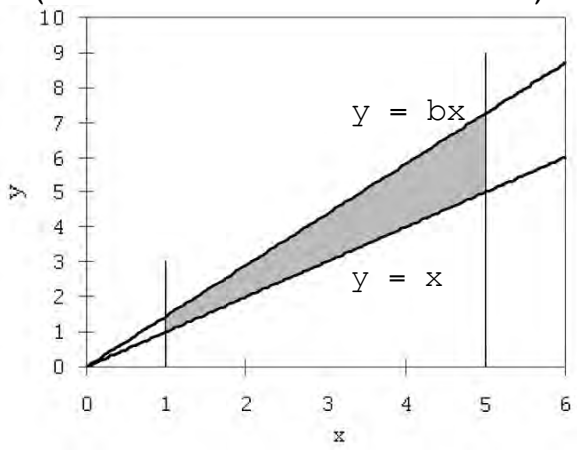
SOLID OF REVOLUTION (RADIANS)
(Axis of Revolution: x = 0)



Volume = ?

05C-59 = _____

05F-59. SOLID OF REVOLUTION
(Axis of Revolution: x = 0)

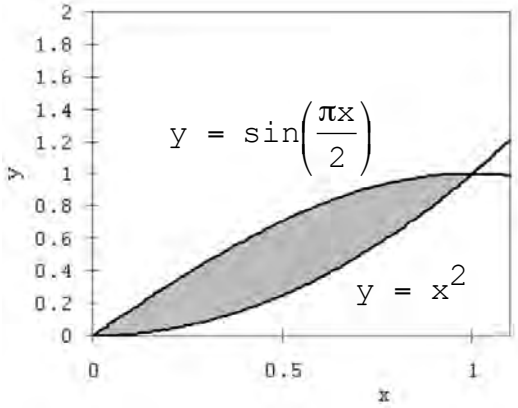


Volume = 120 b = ?

05F-59 = _____

05I-59.

SOLID OF REVOLUTION (RADIANS)
(Axis of Revolution: x = 0)

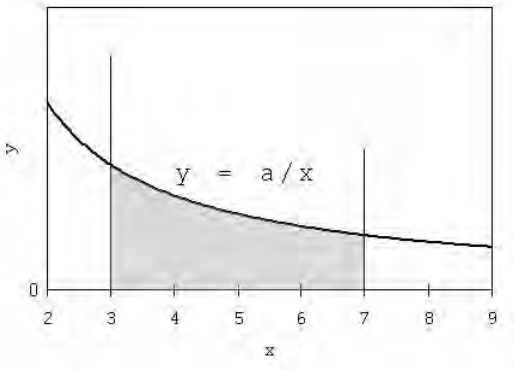


Volume = ?

05I-59 = _____

06A-59.

SOLID OF REVOLUTION
(Axis of Revolution: x = 0)
Volume = 100

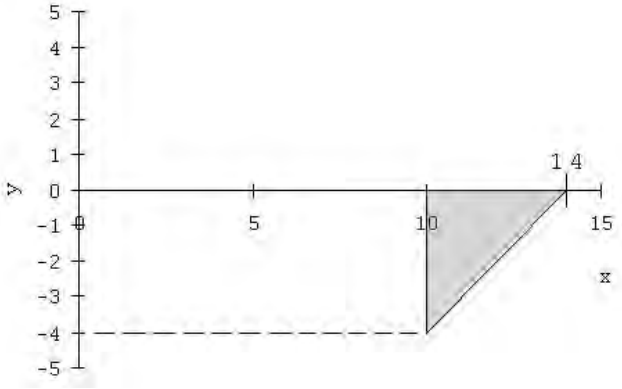


a = ?

06A-59 = _____

06B-59.

SOLID OF REVOLUTION
(Axis of Revolution: x = 0)

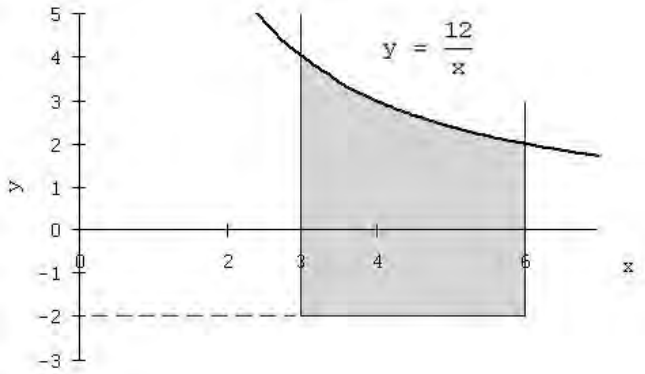


Volume = ?

06B-59 = _____

06G-59.

SOLID OF REVOLUTION
(Axis of Revolution: x = 0)

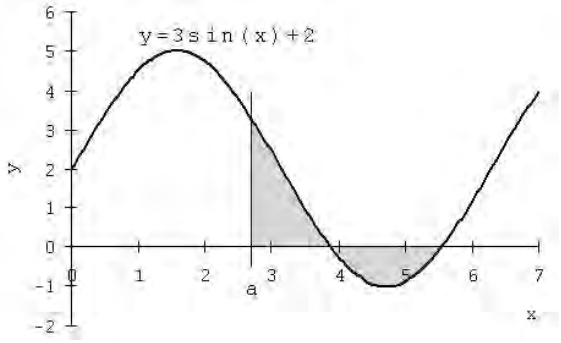


Volume = ?

06G-59 = _____

06H-59.

SOLID OF REVOLUTION (RAD)
(Axis of Revolution: x = 0)
a = ?

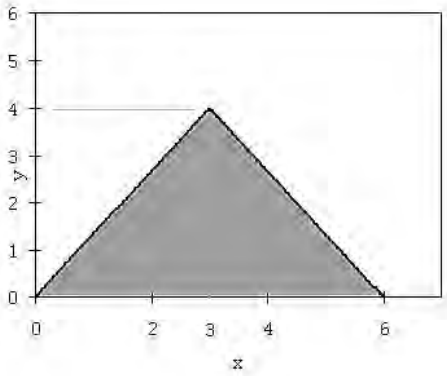


Volume above x-z plane =
Volume below x-z plane

06H-59 = _____

07B-59.

SOLID OF REVOLUTION
(Axis of Revolution: x = 0)

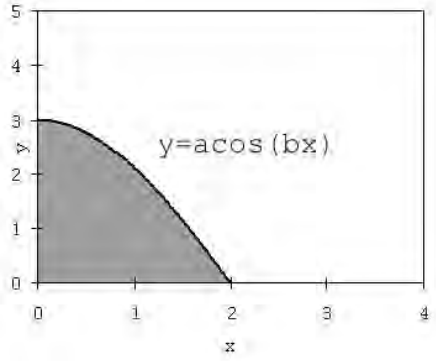


Volume = ?

07B-59 = _____

07C-59.

SOLID OF REVOLUTION (RAD)
(Axis of Revolution: x = 0)

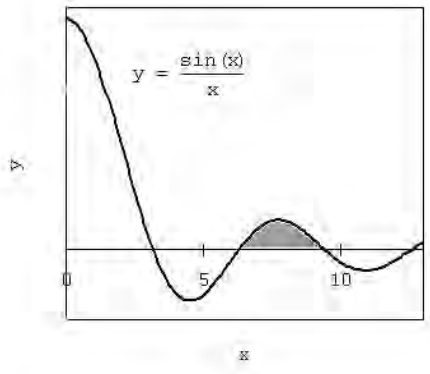


Volume = ?

07C-59 = _____

07G-59.

SOLID OF REVOLUTION (RAD)
(Axis of Revolution: x = 0)

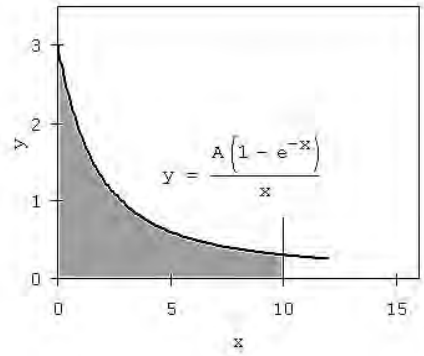


Volume = ?

07G-59 = _____

07I-59.

SOLID OF REVOLUTION
(Axis of Revolution: x = 0)

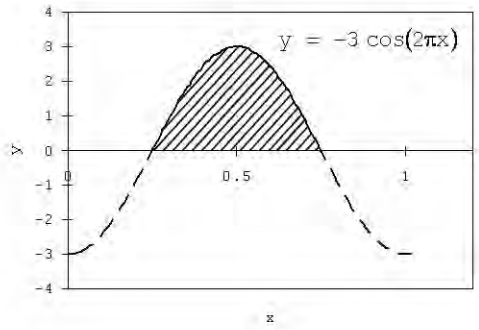


Volume = ?

07I-59 = _____

08A-59.

SOLID OF REVOLUTION (RAD)
(Axis of Revolution: x = 0.2)

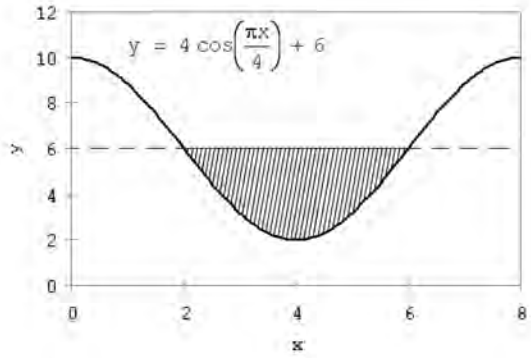


VOLUME = ?

08A-59 = _____

08I-59.

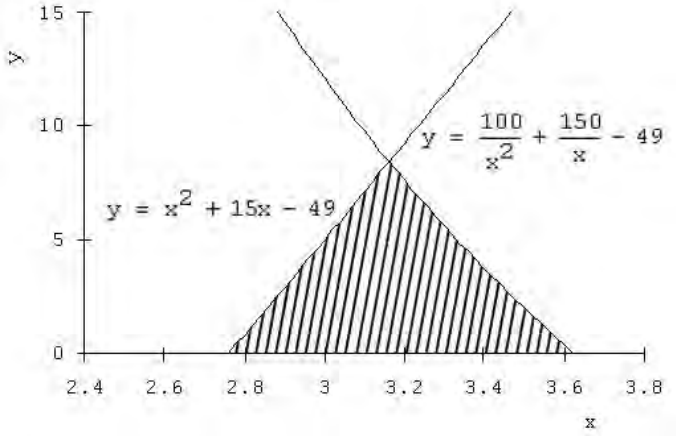
SOLID OF REVOLUTION (RAD)
(Axis of Revolution: x = 1)



VOLUME = ?

08I-59 = _____

09B-59. SOLID OF REVOLUTION
(Axis of Revolution: x = 2.4)

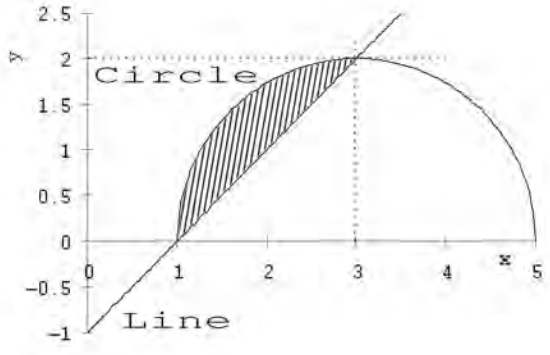


Volume = ?

09B-59 = _____

09I-59.

SOLID OF REVOLUTION
(Axis of Revolution: y = 0)

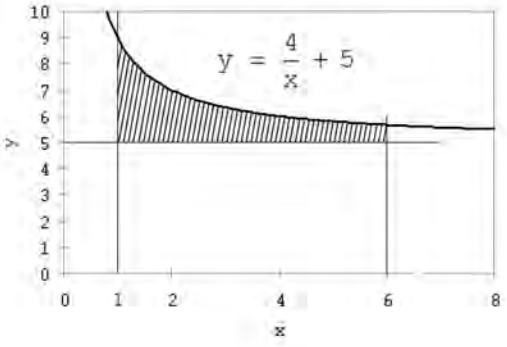


Volume = ?

09I-59 = _____

08D-59.

SOLID OF REVOLUTION
(Axis of Revolution: y = 5)

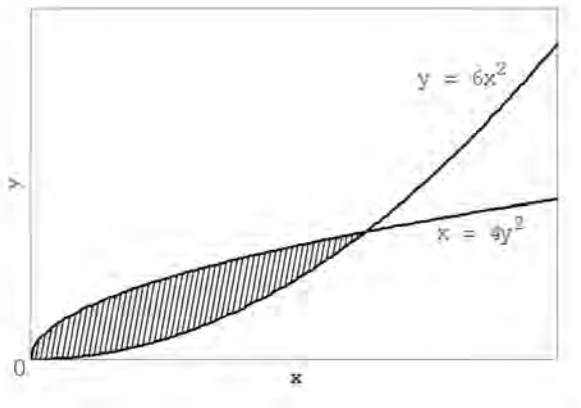


VOLUME = ?

08D-59 = _____

08F-59.

SOLID OF REVOLUTION
(Axis of Revolution: y = -3)

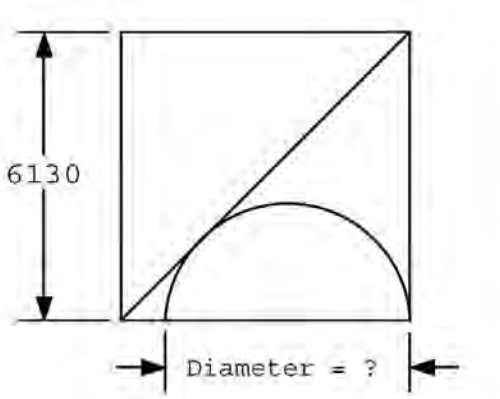


VOLUME = ?

08F-59 = _____

05A-60.

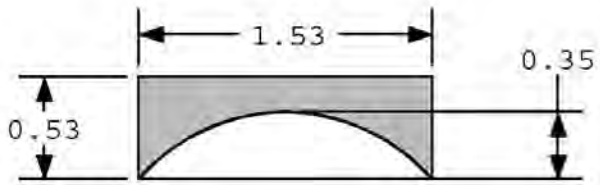
SQUARE, SEMICIRCLE



05A-60 = _____

05B-60.

RECTANGLE, SEGMENT

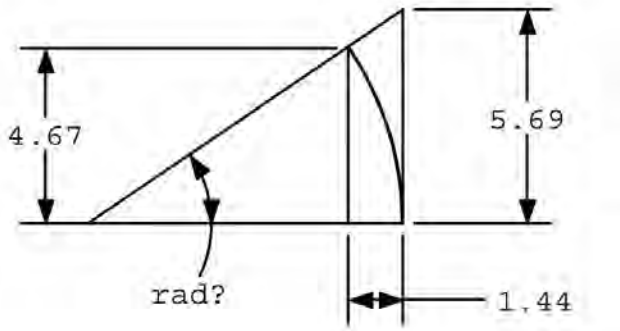


Shaded Area = ?

05B-60 = _____

05C-60.

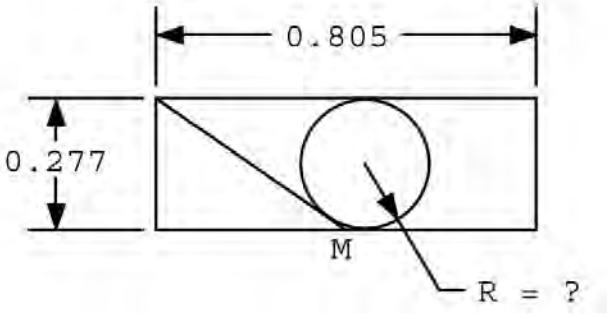
CIRCULAR ARC, RIGHT TRIANGLES



05C-60 = _____

05D-60.

RECTANGLE, CIRCLE

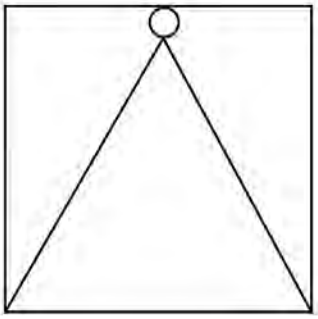


M = midpoint, end of slant line

05D-60 = _____

05E-60.

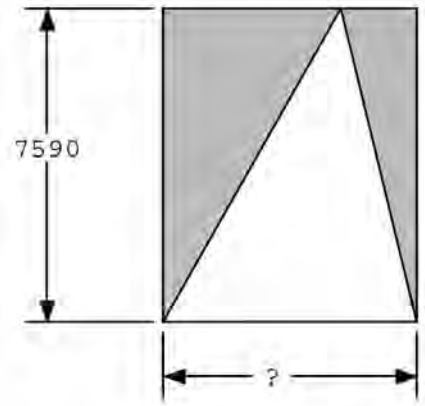
SQUARE, CIRCLE, EQUILATERAL TRIANGLE



$$\frac{\text{Circle Area}}{\text{Square Area}} = ?$$

05E-60 = _____

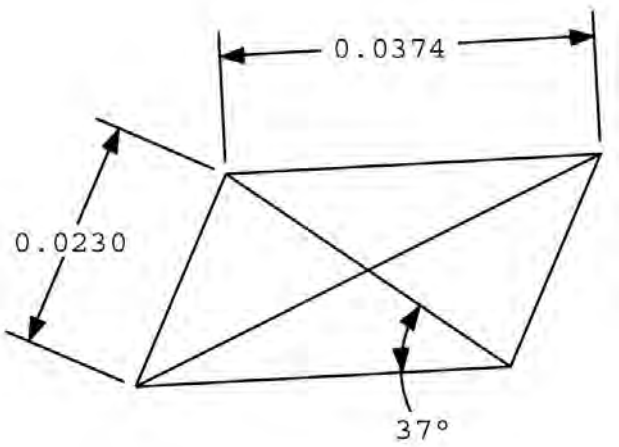
05F-60.
RECTANGLE, SCALENE TRIANGLE



Shaded Area = 2.32×10^7

05F-60 = _____

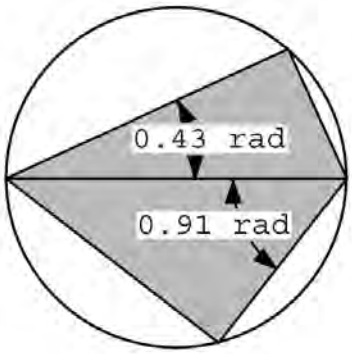
05G-60. PARALLELOGRAM



Product of Diagonals = ?

05G-60 = _____

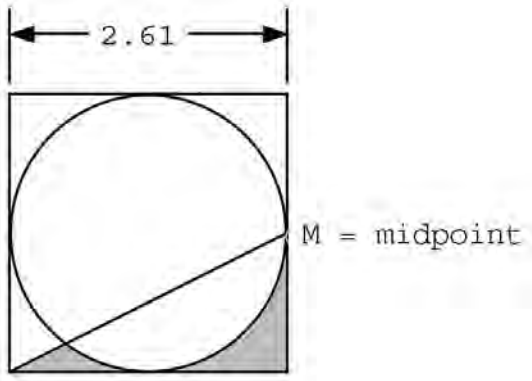
05H-60.
CIRCLE, RIGHT TRIANGLES



Diameter = ?
Shaded Area = 9530

05H-60 = _____

05I-60.
SQUARE, CIRCLE

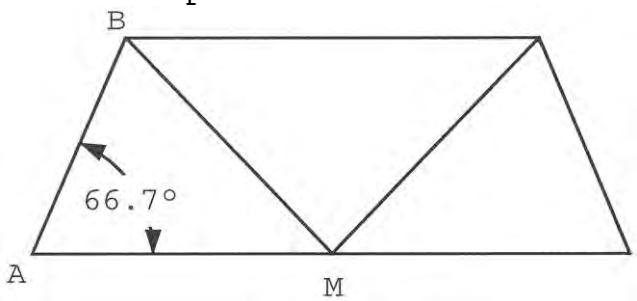


Shaded Area = ?

05I-60 = _____

06A-60.
REGULAR TRAPEZOID

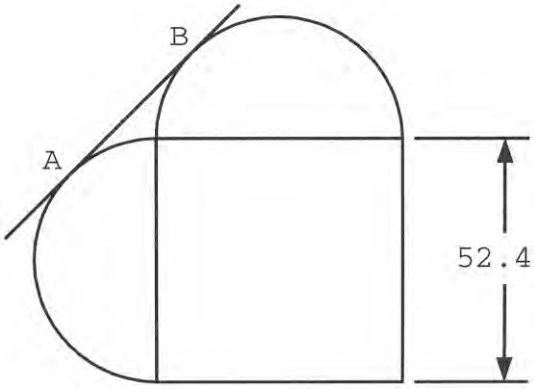
Trapezoid Area = 372



M = midpoint
AM = BM = ?

06A-60 = _____

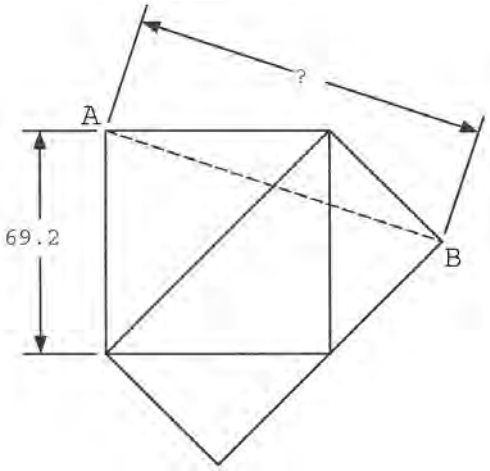
06B-60.
SQUARE AND SEMICIRCLES WITH TANGENT LINE



AB = ?

06B-60 = _____

06C-60. SQUARE AND RECTANGLE

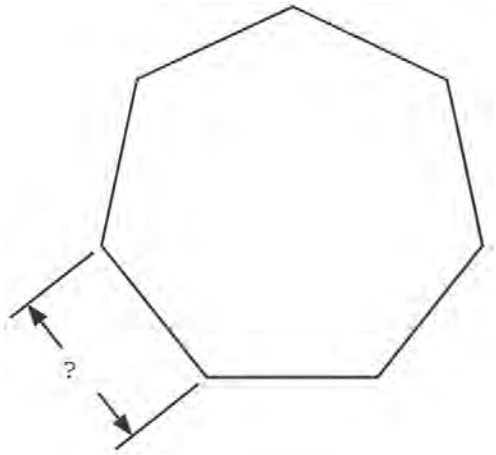


AB = ?

06C-60 = _____

06D-60.

REGULAR HEPTAGON

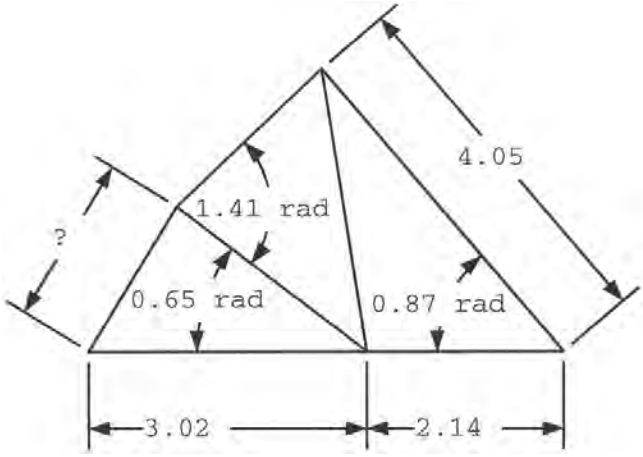


Area = 477

06D-60 = _____

06E-60.

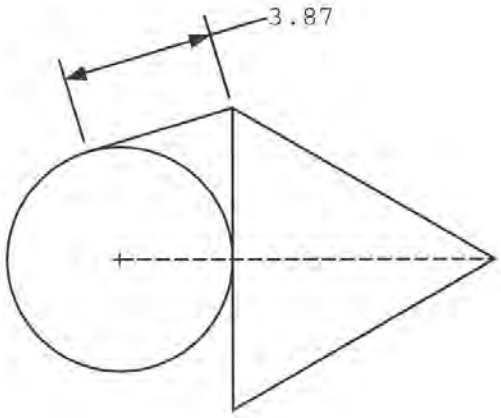
SCALENE TRIANGLES



06E-60 = _____

06F-60.

EQUILATERAL TRIANGLE AND CIRCLE

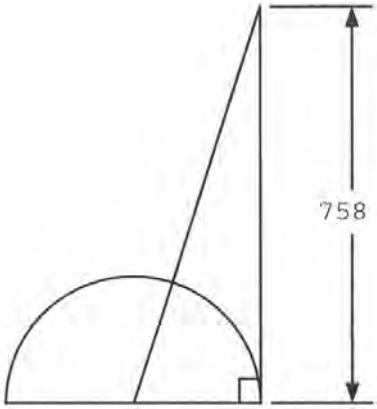


Triangle Area = ?

06F-60 = _____

06G-60.

SEMICIRCLE AND RIGHT TRIANGLE

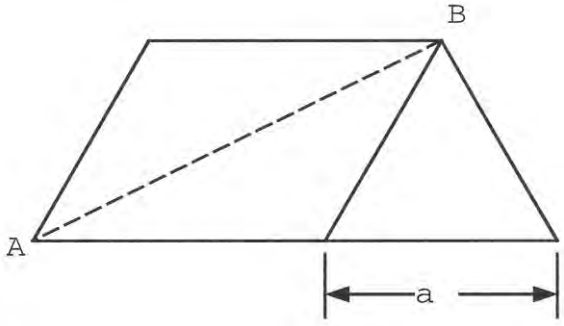


Semicircle Area = Triangle Area = ?

06G-60 = _____

06H-60. PARALLELOGRAM AND EQUILATERAL TRIANGLE

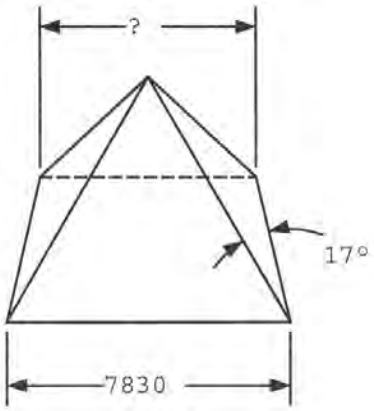
Parallelogram Area = 2.5(Triangle Area)



AB/a = ?

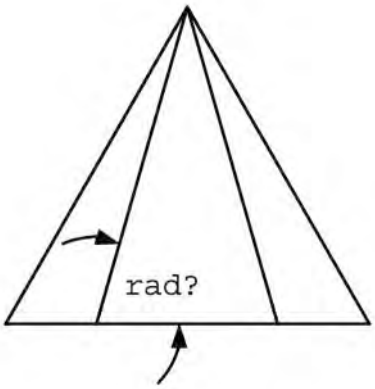
06H-60 = _____

06I-60.
EQUILATERAL AND CONGRUENT ISOSCELES TRIANGLES



06I-60 = _____

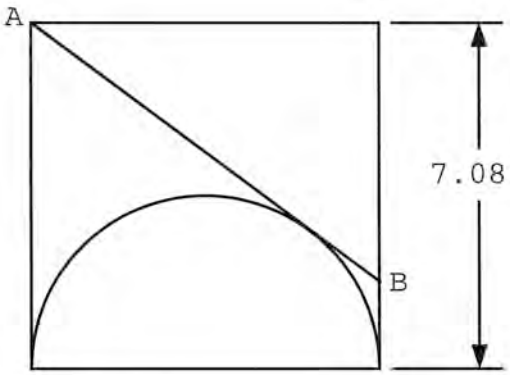
07A-60.
ISOSCELES AND EQUILATERAL TRIANGLE



2[Area(Isosceles Triangle)] = Area(Equilateral Triangle)

07A-60 = _____

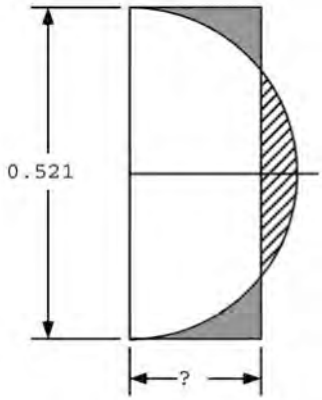
07B-60.
SQUARE AND SEMICIRCLE



AB = ?

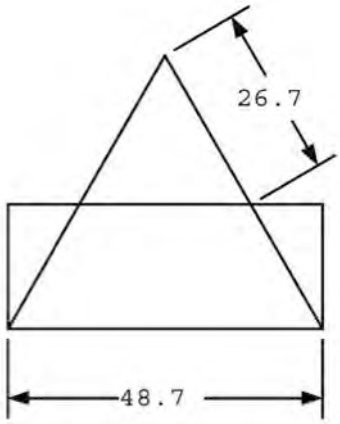
07B-60 = _____

07C-60.
RECTANGLE AND SEMICIRCLE
Shaded Areas = Hatched Area



07C-60 = _____

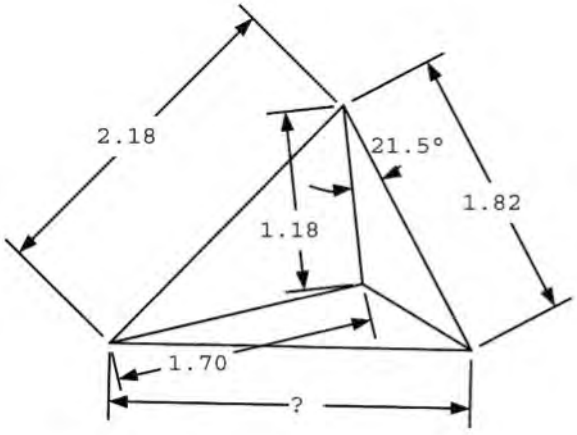
07D-60.
RECTANGLE AND EQUILATERAL TRIANGLE



Rectangle Area = ?

07D-60 = _____

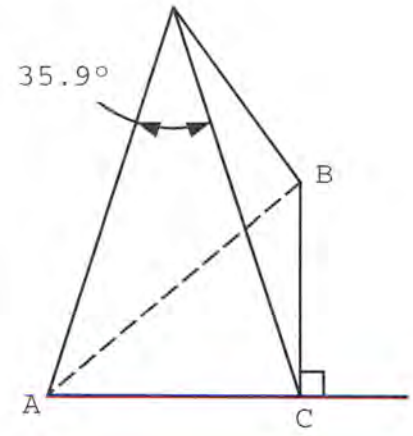
07E-60.
SCALENE TRIANGLES



07E-60 = _____

07F-60.

ISOSCELES TRIANGLES

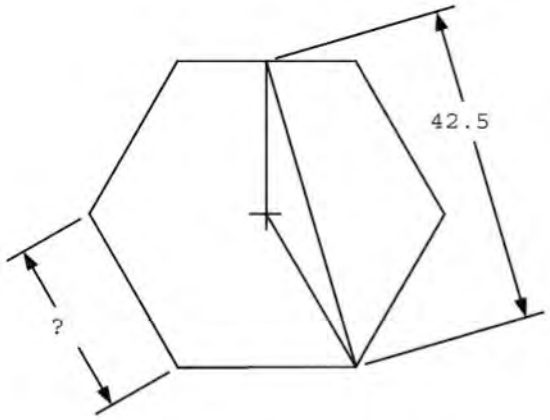


AC = 4.22 AB = ?

07F-60 = _____

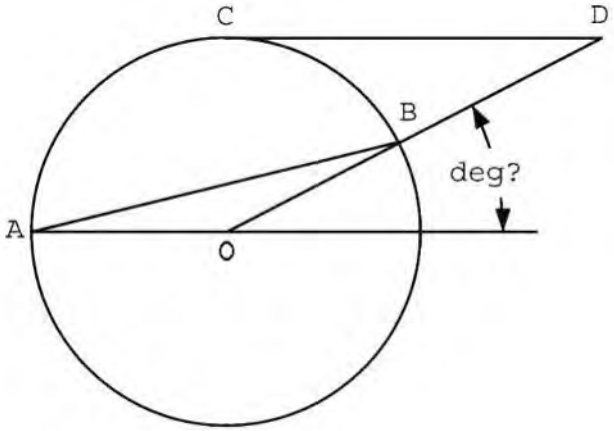
07G-60.

REGULAR HEXAGON



07G-60 = _____

07H-60. CIRCLE

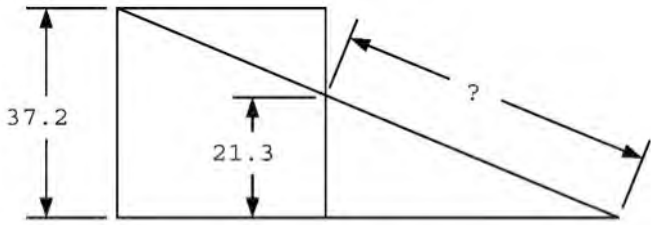


AB = CD, AO is parallel to CD

07H-60 = _____

07I-60.

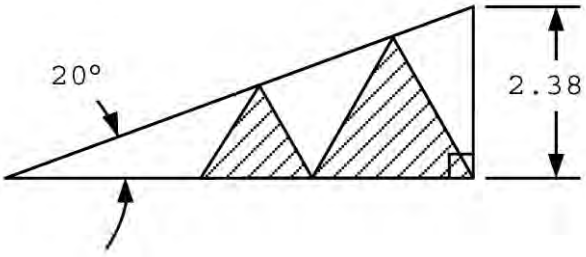
SQUARE AND RIGHT TRIANGLE



07I-60 = _____

08A-60.

RIGHT AND EQUILATERAL TRIANGLES

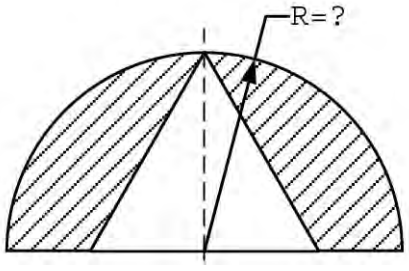


HATCHED AREA = ?

08A-60 = _____

08B-60.

SEMICIRCLE AND EQUILATERAL TRIANGLE

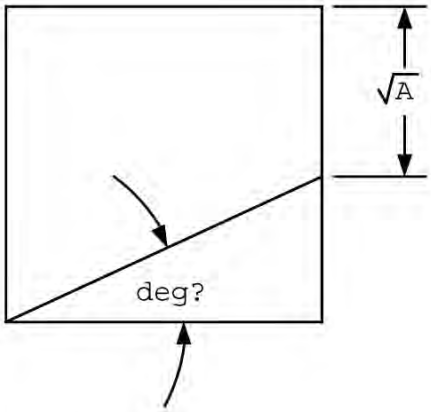


HATCHED AREA = 83.4

08B-60 = _____

08C-60.

SQUARE AND RIGHT TRIANGLE

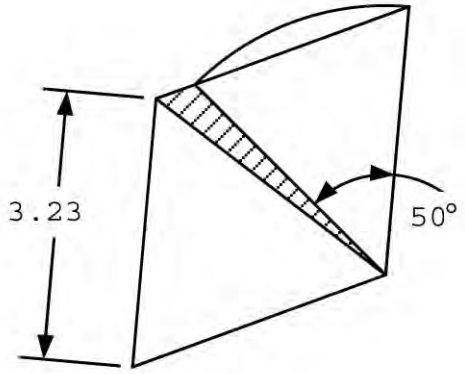


AREA(TRIANGLE) = A

08C-60 = _____

08D-60.

RHOMBUS AND SECTOR

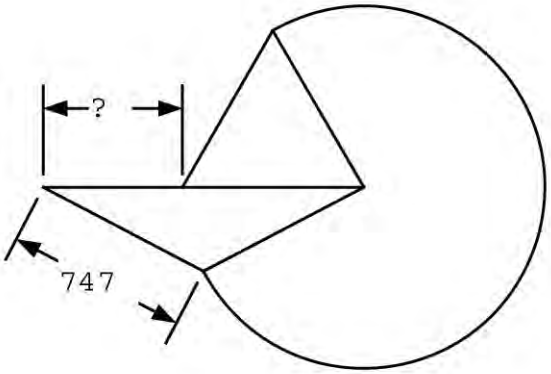


HATCHED AREA = ?

08D-60 = _____

08E-60.

SECTOR, EQUILATERAL AND ISOSCELES TRIANGLES

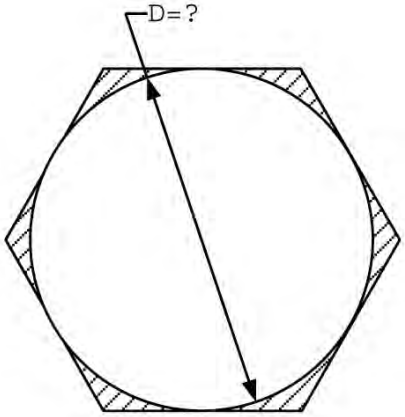


AREA(SECTOR) = 1.33X106

08E-60 = _____

08F-60.

REGULAR HEXAGON AND CIRCLE

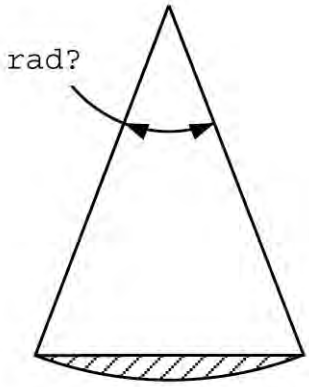


HATCHED AREA = 6280

08F-60 = _____

08G-60.

ISOSCELES TRIANGLE AND SEGMENT

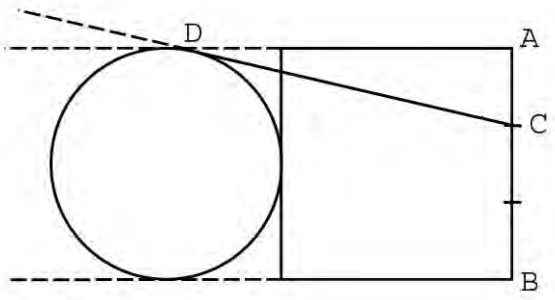


AREA(TRIANGLE) = 2190
AREA(SEGMENT) = 209

08G-60 = _____

08H-60.

CIRCLE AND SQUARE

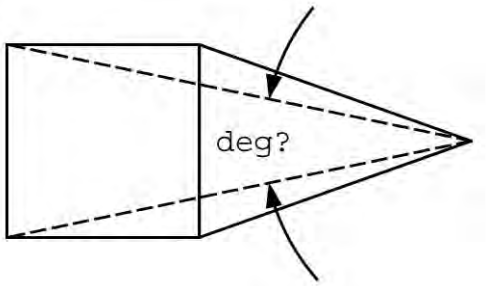


AB IS TRISECTED

CD/AB = ?

08H-60 = _____

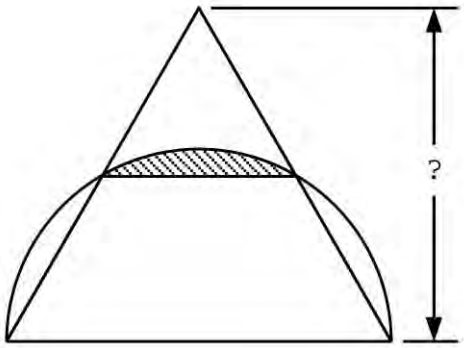
08I-60.
SQUARE AND ISOSCELES TRIANGLE



PERIMETER(SQUARE)=
PERIMETER(TRIANGLE)

08I-60 = _____

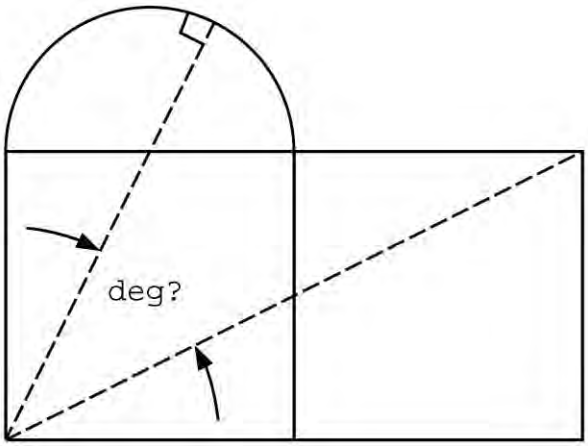
09A-60.
EQUILATERAL TRIANGLE AND SEMICIRCLE



Hatched Area = 683

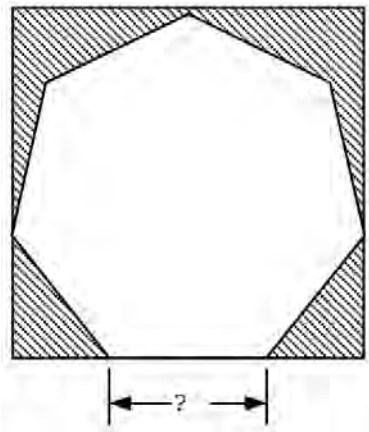
09A-60 = _____

09B-60.
SQUARES AND SEMICIRCLE



09B-60 = _____

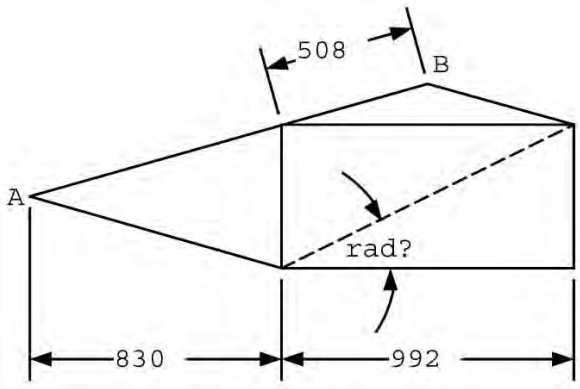
09E-60.
REGULAR HEPTAGON AND SQUARE



Hatched Area = 867

09E-60 = _____

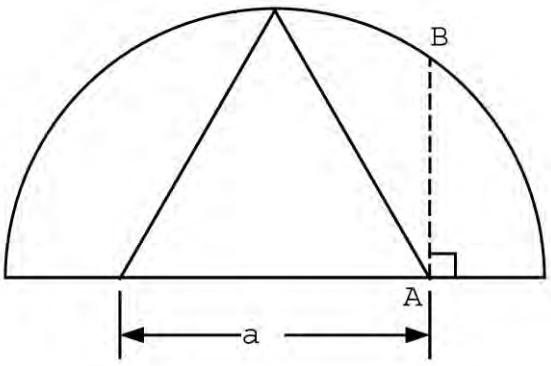
09F-60.
RECTANGLE AND ISOSCELES TRIANGLES



AB is a straight line segment

09F-60 = _____

09G-60.
EQUILATERAL TRIANGLE AND SEMICIRCLE

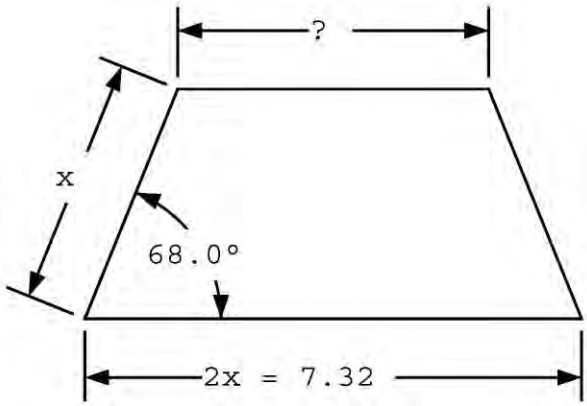


AB/a = ?

09G-60 = _____

09H-60.

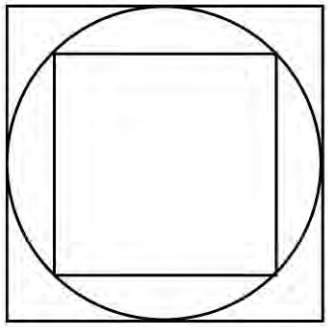
ISOSCELES TRAPEZOID



09H-60 = _____

09I-60.

CIRCLE AND SQUARES



$$\frac{\text{Large Square Area}}{\text{Small Square Area}} = ?$$

09I-60 = _____

2005 Answers

05A-6 = 51.3
= 5.13×10^{1}
05A-7 = 122
integer
05A-8 = 13.9
= 1.39×10^{1}
05A-9 = 0.406
= 4.06×10^{-1}
05A-10 = 0.402
= 4.02×10^{-1}
05A-16 = 1970
= 1.97×10^{3}
05A-17 = 800
integer
05A-18 = 1.48
= 1.48×10^{0}
05A-19 = 0.311
= 3.11×10^{-1}
05A-20 = 337
= 3.37×10^{2}
05A-26 = -0.130
= -1.30×10^{-1}
05A-27 = 2.29
= 2.29×10^{0}
05A-28 = 56.25
= 5.63×10^{1}
05A-29 = 97.0
= 9.70×10^{1}
05A-30 = 0.729
= 7.29×10^{-1}
05A-36 = 7510
= 7.51×10^{3}
05A-37 = 5,960
= 5.96×10^{3}
05A-38 = 2.401
(4SD) = 2.401×10^{0}
05A-39 = 8840
= 8.84×10^{3}
05A-40 = 15200
= 1.52×10^{4}
05A-46 = 1930
= 1.93×10^{3}
05A-47 = 0.00215
= 2.15×10^{-3}
05A-48 = 0.0887
= 8.87×10^{-2}
05A-49 = 145000
= 1.45×10^{5}
05A-50 = 0.133
= 1.33×10^{-1}
05A-56 = 1.27
= 1.27×10^{0}
05A-57 = 0.289
= 2.89×10^{-1}
05A-58 = -365
= -3.65×10^{2}
05A-59 = 7.89
= 7.89×10^{0}
05A-60 = 5080
= 5.08×10^{3}
05B-6 = 93.0
= 9.30×10^{1}
05B-7 = 21.8
= 2.18×10^{1}
05B-8 = 12.4
= 1.24×10^{1}
05B-9 = 1550000
= 1.55×10^{6}
05B-10 = 1770
= 1.77×10^{3}
05B-16 = 0.0866
= 8.66×10^{-2}
05B-17 = 320
= 3.20×10^{2}
05B-18 = 64.0
= 6.40×10^{1}
05B-19 = 0.00314
= 3.14×10^{-3}
05B-20 = 114
= 1.14×10^{2}
05B-26 = 6.40
= 6.40×10^{0}
05B-27 = 6.75
= 6.75×10^{0}
05B-28 = 3,279
integer
05B-29 = 1.05×10^{8}
05B-30 = 2.00×10^{11}
05B-36 = 48.9
= 4.89×10^{1}
05B-37 = 88.8
= 8.88×10^{1}
05B-38 = 19.9
= 1.99×10^{1}
05B-39 = 1.22
= 1.22×10^{0}
05B-40 = 1.49
= 1.49×10^{0}
05B-46 = 9.76
= 9.76×10^{0}
05B-47 = 0.991
= 9.91×10^{-1}
05B-48 = 3.30
= 3.30×10^{0}
05B-49 = 0.878
= 8.78×10^{-1}
05B-50 = 1.49
= 1.49×10^{0}
05B-56 = -0.889
= -8.89×10^{-1}
05B-57 = 0.0170
= 1.70×10^{-2}
05B-58 = 45.9
= 4.59×10^{1}
05B-59 = 60.7
= 6.07×10^{1}
05B-60 = 0.439
= 4.39×10^{-1}
05C-6 = 39
integer
05C-7 = 125
= 1.25×10^{2}
05C-8 = 3.79×10^{7}
05C-9 = 4.40
= 4.40×10^{0}
05C-10 = 72.5
= 7.25×10^{1}
05C-16 = -3.59
= -3.59×10^{0}
05C-17 = 73.6
= 7.36×10^{1}
05C-18 = 3.31
= 3.31×10^{0}
05C-19 = 206000
= 2.06×10^{5}
05C-20 = 19300
= 1.93×10^{4}
05C-26 = 2 integer
05C-27 = 28.0
= 2.80×10^{1}
05C-28 = 42.1
= 4.21×10^{1}
05C-29 = 0.0487
= 4.87×10^{-2}
05C-30 = 0.160
= 1.60×10^{-1}
05C-36 = 5100
= 5.10×10^{3}
05C-37 = 3.37
= 3.37×10^{0}
05C-38 = 0.434
= 4.34×10^{-1}
05C-39 = 0.654
= 6.54×10^{-1}
05C-40 = 0.0427
= 4.27×10^{-2}
05C-46 = 13.2
= 1.32×10^{1}
05C-47 = 0.0154
= 1.54×10^{-2}
05C-48 = 0.363
= 3.63×10^{-1}
05C-49 = 0.0680
= 6.80×10^{-2}
05C-50 = 184
= 1.84×10^{2}
05C-56 = -10.2
= -1.02×10^{1}
05C-57 = 15.3
= 1.53×10^{1}
05C-58 = -322
= -3.22×10^{2}
05C-59 = 25.1
= 2.51×10^{1}
05C-60 = 0.616
= 6.16×10^{-1}
05D-6 = 17.5
= 1.75×10^{1}
05D-7 = 369
= 3.69×10^{2}
05D-8 = 63800
= 6.38×10^{4}
05D-9 = 0.148
= 1.48×10^{-1}
05D-10 = 0.898
= 8.98×10^{-1}
05D-16 = 9.90
= 9.90×10^{0}
05D-17 = 2730
= 2.73×10^{3}
05D-18 = 4.60
= 4.60×10^{0}
05D-19 = 0.921
= 9.21×10^{-1}
05D-20 = 0.0139
= 1.39×10^{-2}
05D-26 = 45.5
= 4.55×10^{1}
05D-27 = 3.00
= 3.00×10^{0}
05D-28 = 3 integer

05D-29 = 24.1
= 2.41×10^{1}
05D-30 = 0.116
= 1.16×10^{-1}
05D-36 = 0.216
= 2.16×10^{-1}
05D-37 = 8.80
= 8.80×10^{0}
05D-38 = 7 integer
05D-39 = 1.20
= 1.20×10^{0}
05D-40 = 1610
= 1.61×10^{3}
05D-46 = 190
= 1.90×10^{2}
05D-47 = 102
= 1.02×10^{2}
05D-48 = 1.27
= 1.27×10^{0}
05D-49 = 1.57
= 1.57×10^{0}
05D-50 = 3.79
= 3.79×10^{0}
05D-56 = 1.50
= 1.50×10^{0}
05D-57 = 0.0625
= 6.25×10^{-2}
05D-58 = -15.5
= -1.55×10^{1}
05D-59 = 118
= 1.18×10^{2}
05D-60 = 0.139
= 1.39×10^{-1}
05E-6 = 18.0
= 1.80×10^{1}
05E-7 = 37.746
(5SD) = 3.7746×10^{1}
05E-8 = $9.00
05E-9 = 119000
= 1.19×10^{5}
05E-10 = 0.474
= 4.74×10^{-1}
05E-16 = -72.9
= -7.29×10^{1}
05E-17 = 1.22×10^{7}
05E-18 = 2100
integer
05E-19 = 64.3
= 6.43×10^{1}
05E-20 = 496
= 4.96×10^{2}
05E-26 = 7100
= 7.10×10^{3}
05E-27 = 219
= 2.19×10^{2}
05E-28 = 55.4
= 5.54×10^{1}
05E-29 = 172000
= 1.72×10^{5}
05E-30 = 0.465
= 4.65×10^{-1}
05E-36 = 4.71
= 4.71×10^{0}
05E-37 = 50.0
= 5.00×10^{1}
05E-38 = 3.33
= 3.33×10^{0}
05E-39 = 3.44
= 3.44×10^{0}
05E-40 = 26.8
= 2.68×10^{1}
05E-46 = 57.6
= 5.76×10^{1}
05E-47 = -0.859
= -8.59×10^{-1}
05E-48 = -0.0419
= -4.19×10^{-2}
05E-49 = 0.403
= 4.03×10^{-1}
05E-50 = 1.17
= 1.17×10^{0}
05E-56 = 2.50
= 2.50×10^{0}
05E-57 = 218
= 2.18×10^{2}
05E-58 = 313
= 3.13×10^{2}
05E-59 = 1.41
= 1.41×10^{0}
05E-60 = 0.0141
= 1.41×10^{-2}
05F-6 = 31.5
= 3.15×10^{1}
05F-7 = 6.82
= 6.82×10^{0}
05F-8 = 1.38
= 1.38×10^{0}
05F-9 = 444
= 4.44×10^{2}
05F-10 = 0.320
= 3.20×10^{-1}
05F-16 = $0.60
05F-17 = 19
integer
05F-18 = 2.66
= 2.66×10^{0}
05F-19 = 12.4
= 1.24×10^{1}
05F-20 = 2.77
= 2.77×10^{0}
05F-26 = 469
= 4.69×10^{2}
05F-27 = 0.0460
= 4.60×10^{-1}
05F-28 = 56.6
= 5.66×10^{1}
05F-29 = 57.5
= 5.75×10^{1}
05F-30 = 0.479
= 4.79×10^{-1}
05F-36 = 24.9
= 2.49×10^{1}
05F-37 = 0.500
= 5.00×10^{-1}
05F-38 = 2,860
= 2.86×10^{3}
05F-39 = 2310
= 2.31×10^{3}
05F-40 = 59.4
= 5.94×10^{1}
05F-46 = 1.25
= 1.25×10^{0}
05F-47 = 288
= 2.88×10^{2}
05F-48 = 2.22
= 2.22×10^{0}
05F-49 = 100
= 1.00×10^{2}
05F-50 = 1.16×10^{6}
05F-56 = 0.524
= 5.24×10^{-1}
05F-57 = 1.00
= 1.00×10^{0}
05F-58 = -1.11
= -1.11×10^{0}
05F-59 = 1.46
= 1.46×10^{0}
05F-60 = 6110
= 6.11×10^{3}
05G-6 = 400
= 4.00×10^{2}
05G-7 = 969
= 9.69×10^{2}
05G-8 = 1.75
= 1.75×10^{0}
05G-9 = 85.1
= 8.51×10^{1}
05G-10 = 0.000552
= 5.52×10^{-4}
05G-16 = $4.72
05G-17 = 26.7
= 2.67×10^{1}
05G-18 = $86.50
05G-19 = 30.9
= 3.09×10^{1}
05G-20 = 134
= 1.34×10^{2}
05G-26 = 3.35
= 3.35×10^{0}
05G-27 = 0.00463
= 4.63×10^{-3}
05G-28 = 25
integer
05G-29 = 972,000
= 9.72×10^{5}
05G-30 = 1.70
= 1.70×10^{0}
05G-36 = 0.443
= 4.43×10^{-1}
05G-37 = 5.79
= 5.79×10^{0}
05G-38 = -0.000259
= -2.59×10^{-4}
(3SD)
05G-39 = 0.123
= 1.23×10^{-1}
05G-40 = 129
= 1.29×10^{2}
05G-46 = 18.0
= 1.80×10^{1}
05G-47 = 1.17
= 1.17×10^{0}
05G-48 = 0.290
= 2.90×10^{-1}
05G-49 = 899
= 8.99×10^{2}
05G-50 = 0.0856
= 8.56×10^{-2}
05G-56 = -5.00
= -5.00×10^{0}
05G-57 = 5000
= 5.00×10^{3}
05G-58 = 1250
= 1.25×10^{3}

05G-59 = 15.9
= $1.59x10^{1}$
05G-60 = 0.00178
= $1.78x10^{-3}$
05H-6 = -7.98
= $-7.98x10^{0}$
05H-7 = 277
= $2.77x10^{2}$
05H-8 = 6 integer
05H-9 = 190
= $1.90x10^{2}$
05H-10 = 0.580
= $5.80x10^{-1}$
05H-16 = 6 integer
05H-17 = 2.78
= $2.78x10^{0}$
05H-18 = 0.588
= $5.88x10^{-1}$
05H-19 = 0.301
= $3.01x10^{-1}$
05H-20 = 2590
= $2.59x10^{3}$
05H-26 = -33.3
= $-3.33x10^{1}$
05H-27 = 0.230
= $2.30x10^{-1}$
05H-28 = 45.4
= $4.54x10^{1}$
05H-29 = 4780
= $4.78x10^{3}$
05H-30 = $1.70x10^{8}$
05H-36 = -171
= $-1.71x10^{2}$
05H-37 = 32.0
= $3.20x10^{1}$
05H-38 = 358
= $3.58x10^{2}$
05H-39 = 114
= $1.14x10^{2}$
05H-40 = 22.2
= $2.22x10^{1}$
05H-46 = 7.20
= $7.20x10^{0}$
05H-47 = $0.28
05H-48 = 93.4
= $9.34x10^{1}$
05H-49 = 2.81
= $2.81x10^{0}$
05H-50 = 3.56
= $3.56x10^{0}$

05H-56 = -1.00
= $-1.00x10^{0}$
05H-57 = 5.33
= $5.33x10^{0}$
05H-58 = -50700
= $-5.07x10^{4}$
05H-59 = 0.100
= $1.00x10^{-1}$
05H-60 = 149
= $1.49x10^{2}$
05I-6 = 207 integer
05I-7 = -6.94
= $-6.94x10^{0}$
05I-8 = 32.0
= $3.20x10^{1}$
05I-9 = 1.95
= $1.95x10^{0}$
05I-10 = 85.4
= $8.54x10^{1}$
05I-16 = 3120
= $3.12x10^{3}$
05I-17 = 190
= $1.90x10^{2}$
05I-18 = 9.00
= $9.00x10^{0}$
05I-19 = 0.0389
= $3.89x10^{-2}$
05I-20 = 0.245
= $2.45x10^{-1}$
05I-26 = 377
= $3.77x10^{2}$
05I-27 = 6.03
= $6.03x10^{0}$
05I-28 = 5.08
= $5.08x10^{0}$
05I-29 = 0.104
= $1.04x10^{-1}$
05I-30 = 4860
= $4.86x10^{3}$
05I-36 = 2022 integer
05I-37 = 10.7
= $1.07x10^{1}$
05I-38 = 5.71
= $5.71x10^{0}$
05I-39 = 0.260
= $2.60x10^{-1}$
05I-40 = 0.0494
= $4.94x10^{-2}$

05I-46 = 1.44
= $1.44x10^{0}$
05I-47 = 12.5
= $1.25x10^{1}$
05I-48 = 0.843
= $8.43x10^{-1}$
05I-49 = 473
= $4.73x10^{2}$
05I-50 = 0.222
= $2.22x10^{-1}$
05I-56 = 0.200
= $2.00x10^{-1}$
05I-57 = 3.40
= $3.40x10^{0}$
05I-58 = 1.36
= $1.36x10^{0}$
05I-59 = 0.976
= $9.76x10^{-1}$
05I-60 = 0.499
= $4.99x10^{-1}$

2006 Answers

06A-6 = -201
= $-2.01x10^{2}$
06A-7 = 18.1
= $1.81x10^{1}$
06A-8 = 43.8
= $4.38x10^{1}$
06A-9 = 11.8
= $1.18x10^{1}$
06A-10 = 19300
= $1.93x10^{4}$
06A-16 = 30.8
= $3.08x10^{1}$
06A-17 = 3340
= $3.34x10^{3}$
06A-18 = $0.60
06A-19 = 0.187
= $1.87x10^{-1}$
06A-20 = 8.30
= $8.30x10^{0}$
06A-26 = 461
= $4.61x10^{2}$
06A-27 = 1110
= $1.11x10^{3}$
06A-28 = 4.50
= $4.50x10^{0}$
06A-29 = 85.6
= $8.56x10^{1}$

06A-30 = 2840
= $2.84x10^{3}$
06A-36 = 2.39
=$2.39x10^{0}$
06A-37 = 0.793
= $7.93x10^{-1}$
06A-38 = 4 integer
06A-39 = 0.748
= $7.48x10^{-1}$
06A-40 = 105
= $1.05x10^{2}$
06A-46 = 12.6
= $1.26x10^{1}$
06A-47 = -15000
= $-1.5x10^{4}$
06A-48 = 0.0246
= $2.46x10^{-2}$
06A-49 = 7.10
= $7.10x10^{0}$
06A-50 = 17.2
= $1.72x10^{1}$
06A-56 = 151
= $1.51x10^{2}$
06A-57 = 10.6
= $1.06x10^{1}$
06A-58 = 0.993
= $9.93x10^{-1}$
06A-59 = 3.98
= $3.98x10^{0}$
06A-60 = 17.4
= $1.74x10^{1}$
06A-66 = 11200
= $1.12x10^{4}$
06A-67 = 13.9
= $1.39x10^{1}$
06A-68 = 19.7
= $1.97x10^{1}$
06A-69 = 0.194
= $1.94x10^{-1}$
06A-70 = 66.3
= $6.63x10^{1}$
06B-6 = 10.0
= $1.00x10^{1}$
06B-7 = 5430
= $5.43x10^{3}$
06B-8 = 480 integer
06B-9 = 3.63
= $3.63x10^{0}$
06B-10 = 2730
= $2.73x10^{3}$

06B-16 = 153
= 1.53×10^{2}
06B-17 = 348
= 3.48×10^{2}
06B-18 = $1226.52
06B-19 = 45.8
= 4.58×10^{1}
06B-20 = 23.9
= 2.39×10^{1}
06B-26 = 84.0
= 8.40×10^{1}
06B-27 = 17.0
= 1.70×10^{1}
06B-28 = 5.56×10^{7}
06B-29 = 0.158
= 1.58×10^{-1}
06B-30 = 1750
= 1.75×10^{3}
06B-36 = 2.55
= 2.55×10^{0}
06B-37 = 64.9
= 6.49×10^{1}
06B-38 = 5.00
= 5.00×10^{0}
06B-39 = 253
= 2.53×10^{2}
06B-40 = 6680
= 6.68×10^{3}
06B-46 = 1.27×10^{7}
06B-47 = 4.51
= 4.51×10^{0}
06B-48 = 0.0462
= 4.62×10^{-2}
06B-49 = 514
= 5.14×10^{2}
06B-50 = 19.9
= 1.99×10^{1}
06B-56 = 2.02
= 2.02×10^{0}
06B-57 = 10.4
= 1.04×10^{1}
06B-58 = 4.08
= 4.08×10^{0}
06B-59 = 570
= 5.70×10^{2}
06B-60 = 37.1
= 3.71×10^{1}
06B-66 = 177
= 1.77×10^{2}
06B-67 = 1.20 3SD)
= 1.20×10^{0}
06B-68 = 12.5
= 1.25×10^{1}
06B-69 = 1.42
= 1.42×10^{0}
06B-70 = 52.4
= 5.24×10^{1}
06C-6 = 468
= 4.68×10^{2}
06C-7 = 511
= 5.11×10^{2}
06C-8 = 0.914
= 9.14×10^{-1}
06C-9 = 1.30
= 1.30×10^{0}
06C-10 = 231
= 2.31×10^{2}
06C-16 = 97.0
= 9.70×10^{1}
06C-17 = 2.29
= 2.29×10^{0}
06C-18 = 54834
integer
06C-19 = 37.7
= 3.77×10^{1}
06C-20 = 0.493
= 4.93×10^{-1}
06C-26 = $937.37
06C-27 = 12.9
= 1.29×10^{1}
06C-28 = 8.67
= 8.67×10^{0}
06C-29 = 0.454
= 4.54×10^{-1}
06C-30 = 85800
= 8.58×10^{4}
06C-36 = 5.07
= 5.07×10^{0}
06C-37 = 67.0
= 6.70×10^{1}
06C-38 = 1.70×10^{-74584}
06C-39 = 30000
= 3.00×10^{4}
06C-40 = 1.40
= 1.40×10^{0}
06C-46 = 11.6
= 1.16×10^{1}
06C-47 = 16.4
= 1.64×10^{1}
06C-48 = 0.545
= 5.45×10^{-1}
06C-49 = 1.15
= 1.15×10^{0}
06C-50 = 3.11
= 3.11×10^{0}
06C-56 = 2.60
= 2.60×10^{0}
06C-57 = 3.19
= 3.19×10^{0}
06C-58 = 324
= 3.24×10^{2}
06C-59 = 0.190
= 1.90×10^{-1}
06C-60 = 109
= 1.09×10^{2}
06C-66 = 184
= 1.84×10^{2}
06C-67 = 391
= 3.91×10^{2}
06C-68 = 7.16
= 7.16×10^{0}
06C-69 = 1210
= 1.21×10^{3}
06C-70 = 76.6
= 7.66×10^{1}
06D-6 = 3.69
= 3.69×10^{0}
06D-7 = 28.3
= 2.83×10^{1}
06D-8 = 138
= 1.38×10^{2}
06D-9 = 0.750
= 7.50×10^{-1}
06D-10 = 1.86
= 1.86×10^{0}
06D-16 = $12.67
06D-17 = 7.95
= 7.95×10^{0}
06D-18 = 34
integer
06D-19 = 1060
= 1.06×10^{3}
06D-20 = 0.0386
= 3.86×10^{-2}
06D-26 = 1.99
= 1.99×10^{0}
06D-27 = 99.7
= 9.97×10^{1}
06D-28 = 148
= 1.48×10^{2}
06D-29 = 91.7
= 9.17×10^{1}
06D-30 = 48.8
= 4.88×10^{1}
06D-36 = 3.63
= 3.63×10^{0}
06D-37 = 72
integer
06D-38 = $1.84 \times 10^{236,843}$
06D-39 = 0.764
= 7.64×10^{-1}
06D-40 = 78.0
= 7.80×10^{1}
06D-46 = 26.3
= 2.63×10^{1}
06D-47 = -16800
= -1.68×10^{4}
06D-48 = 1.36
= 1.36×10^{0}
06D-49 = 7.85
= 7.85×10^{0}
06D-50 = 18.1
= 1.81×10^{1}
06D-56 = 35.3
= 3.53×10^{1}
06D-57 = -1.67
= -1.67×10^{0}
06D-58 = 0.211
= 2.11×10^{-1}
06D-59 = 3.51
= 3.51×10^{0}
06D-60 = 11.5
= 1.15×10^{1}
06D-66 = 3.02
= 3.02×10^{0}
06D-67 = 679
= 6.79×10^{2}
06D-68 = 322
= 3.22×10^{2}
06D-69 = 2110
= 2.11×10^{3}
06D-70 = 32.9
= 3.29×10^{1}
06E-6 = 2910
= 2.91×10^{3}
06E-7 = 55.3
= 5.53×10^{1}
06E-8 = 1.61×10^{6}
06E-9 = 7.48
= 7.48×10^{0}

06E-10 = 885
= $8.85x10^{2}$
06E-16 = -11.0
= $-1.10x10^{1}$
06E-17 = 28 integer
06E-18 = 9 integer
06E-19 = 0.147
= $1.47x10^{-1}$
06E-20 = 6250
= $6.25x10^{3}$
06E-26 = 2250
= $2.25x10^{3}$
06E-27 = 1680
= $1.68x10^{3}$
06E-28 = 6.67
= $6.67x10^{0}$
06E-29 = $7.52x10^{7}$
06E-30 = 151
= $1.51x10^{2}$
06E-36 = 487 (3SD)
= $4.87x10^{2}$
06E-37 = 2.98
= $2.98x10^{0}$
06E-38 = 6.38
= $6.38x10^{0}$
06E-39 = 1.08
= $1.08x10^{0}$
06E-40 = 35.6
= $3.56x10^{1}$
06E-46 = 3.04
= $3.04x10^{0}$
06E-47 = 51.1
= $5.11x10^{1}$
06E-48 = 0.451
= $4.51x10^{-1}$
06E-49 = 65.8
= $6.58x10^{1}$
06E-50 = 22.9
= $2.29x10^{1}$
06E-56 = 0.300
= $3.00x10^{-1}$
06E-57 = 39.5
= $3.95x10^{1}$
06E-58 = 257
= $2.57x10^{2}$
06E-59 = 6.93
= $6.93x10^{0}$
06E-60 = 1.84
= $1.84x10^{0}$

06E-66 = 9.47
= $9.47x10^{0}$
06E-67 = 107
= $1.07x10^{2}$
06E-68 = 6.00
= $6.00x10^{0}$
06E-69 = 0.350
= $3.50x10^{-1}$
06E-70 = 202
= $2.02x10^{2}$
06F-6 = 9 integer
06F-7 = 4.16
= $4.16x10^{0}$
06F-8 = 24.1
= $2.41x10^{1}$
06F-9 = 3150
= $3.15x10^{3}$
06F-10 = 2.34
= $2.34x10^{0}$
06F-16 = -32.0
= $-3.20x10^{1}$
06F-17 = 4.76
= $4.76x10^{0}$
06F-18 = 12.6
= $1.26x10^{1}$
06F-19 = 0.900
= $9.00x10^{-1}$
06F-20 = 0.544
= $5.44x10^{-1}$
06F-26 = 39.5
= $3.95x10^{1}$
06F-27 = 1670 (3SD)
= $1.67x10^{3}$
06F-28 = 35.3
= $3.53x10^{1}$
06F-29 = 17.6
= $1.76x10^{1}$
06F-30 = 0.771
= $7.71x10^{-1}$
06F-36 = $8.96x10^{769}$
06F-37 = -1.67
= $-1.67x10^{0}$
06F-38 = 2020
= $2.02x10^{3}$
06F-39 = 10.4
= $1.04x10^{1}$
06F-40 = 98.2
= $9.82x10^{1}$
06F-46 = 121000
= $1.21x10^{5}$

06F-47 = -14.7
= $-1.47x10^{1}$
06F-48 = 2.87
= $2.87x10^{0}$
06F-49 = 1.30
= $1.30x10^{0}$
06F-50 = 91.4
= $9.14x10^{1}$
06F-56 = 1.27
= $1.27x10^{0}$
06F-57 = $300.00
06F-58 = 39.0
= $3.90x10^{1}$
06F-59 = -1.05
= $-1.05x10^{0}$
06F-60 = 25.9
= $2.59x10^{1}$
06F-66 = 13.5
= $1.35x10^{1}$
06F-67 = 13 integer
06F-68 = 22.0
= $2.20x10^{1}$
06F-69 = 47.6
= $4.76x10^{1}$
06F-70 = 49.1
= $4.91x10^{1}$
06G-6 = 197
= $1.97x10^{2}$
06G-7 = -2.47
= $-2.47x10^{0}$
06G-8 = 30.0
= $3.00x10^{1}$
06G-9 = 0.0888
= $8.88x10^{-2}$
06G-10 = 265000
= $2.65x10^{5}$
06G-16 = $2.42
06G-17 = 0.0178
= $1.78x10^{-2}$
06G-18 = 34 integer
06G-19 = 177
= $1.77x10^{2}$
06G-20 = 0.741
= $7.41x10^{-1}$
06G-26 = 41.4
= $4.14x10^{1}$
06G-27 = 61.6
= $6.16x10^{1}$
06G-28 = 27.3
= $2.73x10^{1}$

06G-29 = 4.34
= 4.3410^{0}
06G-30 = $5.71x10^{8}$
06G-36 = 1.28
= $1.28x10^{0}$
06G-37 = 12.5 (3SD)
= $1.25x10^{1}$
06G-38 = 1410000
= $1.41x10^{6}$
06G-39 = 1.80
= $1.80x10^{0}$
06G-40 = 0.615
= $6.15x10^{-1}$
06G-46 = 56.0
= $5.60x10^{1}$
06G-47 = -6510 integer
06G-48 = 1.22
= $1.22x10^{0}$
06G-49 = 41100
= $4.11x10^{4}$
06G-50 = 388
= $3.88x10^{2}$
06G-56 = 1.50
= $1.50x10^{0}$
06G-57 = $1.07x10^{13}$
06G-58 = 17900
= $1.79x10^{4}$
06G-59 = 396
= $3.96x10^{2}$
06G-60 = 91400
= $9.14x10^{4}$
06G-66 = 738
= $7.38x10^{2}$
06G-67 = 49.6
= $4.96x10^{1}$
06G-68 = 9.00
= $9.00x10^{0}$
06G-69 = 967
= $9.67x10^{2}$
06G-70 = 240
= $2.40x10^{2}$
06H-6 = 33.3
= $3.33x10^{1}$
06H-7 = 36.4
= $3.64x10^{1}$
06H-8 = 4 integer
06H-9 = 48400
= $4.84x10^{4}$

06H-10 = 708
= 7.08×10^{2}
06H-16 = 37200
= 3.72×10^{4}
06H-17 = 5.00
= 5.00×10^{0}
06H-18 = 5480
= 5.48×10^{3}
06H-19 = 24.1
= 2.41×10^{1}
06H-20 = 2120
= 2.12×10^{3}
06H-26 = 7.76×10^{7}
06H-27 = 91
integer
06H-28 =
6.84×10^{78672}
06H-29 = 55.9
= 5.59×10^{1}
06H-30 = 0.209
= 2.09×10^{-1}
06H-36 = 3.24
= 3.24×10^{0}
06H-37 = 59 (2SD)
= 5.9×10^{1}
06H-38 = 2.93×10^{-400882}
06H-39 = 73.8
= 7.38×10^{1}
06H-40 = 181
= 1.81×10^{2}
06H-46 = 159
integer
06H-47 = 7.00
= 7.00×10^{0}
06H-48 = -1.08
= -1.08×10^{0}
06H-49 = 345000
= 3.45×10^{5}
06H-50 = 3.85
= 3.85×10^{0}
06H-56 = 16.2
= 1.62×10^{1}
06H-57 = 41.7
= 4.17×10^{1}
06H-58 = -1.37
= -1.37×10^{0}
06H-59 = 2.76
= 2.76×10^{0}
06H-60 = 1.95
= 1.95×10^{0}
06H-66 = 0.826
= 8.26×10^{-1}
06H-67 = 4.51
= 4.51×10^{0}
06H-68 = 20.2
= 2.0210^{1}
06H-69 = 0.980
= 9.80×10^{-1}
06H-70 = 1080
= 1.08 $\times 10^{3}$
06I-6 = 4760
= 4.76×10^{3}
06I-7 = 1.72
= 1.72×10^{0}
06I-8 = 22
integer
06I-9 = 8400
= 8.40×10^{3}
06I-10 = 48.8
= 4.88×10^{1}
06I-16 = 10.6
= 1.06×10^{1}
06I-17 = 4570
= 4.57×10^{3}
06I-18 = 1800
= 1.80×10^{3}
06I-19 = 1340
= 1.34×10^{3}
06I-20 = 1.31
= 1.31×10^{0}
06I-26 = 7 integer
06I-27 = 36 (2SD)
= 3.6×10^{1}
06I-28 =
1.23×10^{4776}
06I-29 = 0.226
= 2.26×10^{-1}
06I-30 = 1.00×10^{8}
06I-36 = -0.177
= -1.77×10^{-1}
06I-37 = 12
integer
06I-38 = 62.9
(3SD)
= 6.29×10^{1}
06I-39 = 7400
= 7.40×10^{3}
06I-40 = 0.251
= 2.51×10^{-1}
06I-46 = 0.566
= 5.66x10
06I-47 = 0.0290
= 2.90×10^{-2}
06I-48 = 214
= 2.14×10^{2}
06I-49 = 0.833
= 8.33×10^{-1}
06I-50 = 66.3
= 6.63×10^{1}
06I-56 = 0.748
= 7.48×10^{-1}
06I-57 = 12.0
= 1.20×10^{1}
06I-58 = 11.5
= 1.15×10^{1}
06I-59 = 6.49
= 6.49×10^{0}
06I-60 = 5990
= 5.99×10^{3}
06I-66 = 0.902
= 9.02×10^{-1}
06I-67 = 0.0594
= 5.94×10^{-2}
06I-68 = 2340
= 2.34×10^{3}
06I-69 = 60.4
= 6.04×10^{1}
06I-70 = 1.79
= 1.79×10^{0}

2007 Answers

07A-6 = 23.2
= 2.32×10^{1}
07A-7 = 76.9
= 7.69×10^{1}
07A-8 = 315
= 3.15×10^{2}
07A-9 = 2.90
= 2.90×10^{0}
07A-10 = 3,460,000
= 3.46×10^{6}
07A-16 = 96.0
= 9.60×10^{1}
07A-17 = 336
= 3.36×10^{2}
07A-18 = 986,000
= 9.86×10^{5}
07A-19 = 678
= 6.78×10^{2}
07A-20 = 0.348
= 3.48×10^{-1}
07A-26 = 51
integer
07A-27 = 58.6
= 5.86×10^{1}
07A-28 = 5.52
= 5.52×10^{0}
07A-29 = 3.92×10^{10}
07A-30 = 5.71
= 5.71×10^{0}
07A-36 = -2.07
(3SD) = -2.07×10^{0}
07A-37 = 231
= 2.31×10^{2}
07A-38 = 288
= 2.88×10^{2}
07A-39 = 2.39
= 2.39×10^{0}
07A-40 = 1020
= 1.02×10^{3}
07A-46 = 2.12
= 2.12×10^{0}
07A-47 = 320
= 3.20×10^{2}
07A-48 = 3.77
= 3.77×10^{0}
07A-49 = 251
= 2.51×10^{2}
07A-50 = 278
= 2.78×10^{2}
07A-56 = 9.93
= 9.93×10^{0}
07A-57 = 73.0
= 7.30×10^{1}
07A-58 = -1180
= -1.18×10^{3}
07A-59 = 15.1
= 1.51×10^{1}
07A-60 = 1.29
= 1.29×10^{0}
07A-66 = 9 integer
07A-67 = 11.5
= 1.15×10^{1}
07A-68 = 21.3
= 2.13×10^{1}
07A-69 = 0.609
= 6.09×10^{-1}
07A-70 = 5.16
= 5.16×10^{0}
07B-6 = 625
= 6.25×10^{2}
07B-7 = 7410
= 7.41×10^{3}
07B-8 = 8.33
= 8.33×10^{0}
07B-9 = 15.5
= 1.55×10^{1}

07B-10 = 0.231
= $2.31x10^{-1}$
07B-16 = $8442.01
07B-17 = 66.7
= $6.67x10^{1}$
07B-18 = 49.5
= $4.95x10^{1}$
07B-19 = 3,420,000
= $3.42x10^{6}$
07B-20 = 528
= $5.28x10^{2}$
07B-26 = 5.39
= $5.39x10^{0}$
07B-27 = 232
= $2.32x10^{2}$
07B-28 = 0.681
= $6.81x10^{-1}$
07B-29 = $1.99x10^{8}$
07B-30 = 8.65
= $8.65x10^{0}$
07B-36 = 81
integer
07B-37 = 388
= $3.88x10^{2}$
07B-38 = $3.93x10^{8}$ 24,614
07B-39 = 14.4
= $1.44x10^{1}$
07B-40 = 647
= $6.47x10^{2}$
07B-46 = 63.5
= $6.35x10^{1}$
07B-47 = 0.996
= $9.96x10^{-1}$
07B-48 = 1.33
= $1.33x10^{0}$
07B-49 = 13.1
= $1.31x10^{1}$
07B-50 = 0.309
= $3.09x10^{-1}$
07B-56 = 2450
= $2.45x10^{3}$
07B-57 = 2.65
= $2.65x10^{0}$
07B-58 = 4.00
= $4.00x10^{0}$
07B-59 = 226
= $2.26x10^{2}$
07B-60 = 8.85
= $8.85x10^{0}$
07B-66 = 5240
= $5.24x10^{3}$
07B-67 = 26 (2SD)
= $2.6x10^{1}$
07B-68 = 6.59
= $6.59x10^{0}$
07B-69 = 0.957
= $9.57x10^{-1}$
07B-70 = 309
= $3.09x10^{2}$
07C-6 = 0.244
= $2.44x10^{-1}$
07C-7 = 21.2
= $2.12x10^{1}$
07C-8 = 210
integer
07C-9 = 1,000,000
= $1.00x10^{6}$
07C-10 = 2.32
= $2.32x10^{0}$
07C-16 = -1.19
= $-1.19x10^{0}$
07C-17 = 12.5
= $1.25x10^{1}$
07C-18 = 126,000
= $1.26x10^{5}$
07C-19 = 1.04
= $1.04x10^{0}$
07C-20 = 1.02
= $1.02x10^{0}$
07C-26 = -49.9
= $-4.99x10^{1}$
07C-27 = 133,000
= $1.33x10^{5}$
07C-28 = 45.8
= $4.58x10^{1}$
07C-29 = 4.92
= $4.92x10^{0}$
07C-30 = 4120
= $4.12x10^{3}$
07C-36 = 2.09
= $2.09x10^{0}$
07C-37 = 3.1 (2SD)
= $3.1x10^{0}$
07C-38 = 3.17
= $3.17x10^{0}$
07C-39 = 5.80
= $5.80x10^{0}$
07C-40 = 74.9
= $7.49x10^{1}$
07C-46 = 7.94
= $7.94x10^{0}$
07C-47 = 12.6
= $1.26x10^{1}$
07C-48 = 1.95
= $1.95x10^{0}$
07C-49 = 3.97
= $3.97x10^{0}$
07C-50 = 1.63
= $1.63x10^{0}$
07C-56 = 2.97
= $2.97x10^{0}$
07C-57 = 5300
= $5.30x10^{3}$
07C-58 = 444
= $4.44x10^{2}$
07C-59 = 17.4
= $1.74x10^{1}$
07C-60 = 0.205
= $2.05x10^{-1}$
07C-66 = 60
integer
07C-67 = 2.37
= $2.37x10^{0}$
07C-68 = 110
= $1.10x10^{2}$
07C-69 = 0.412
= $4.12x10^{-1}$
07C-70 = 0.0618
= $6.18x10^{-2}$
07D-6 = 3250
= $3.25x10^{3}$
07D-7 = 96.0
= $9.60x10^{1}$
07D-8 = 84.4
= $8.44x10^{1}$
07D-9 = 0.991
= $9.91x10^{-1}$
07D-10 = 65300
= $6.53x10^{4}$
07D-16 = -0.0701
= $-7.01x10^{-2}$
07D-17 = 14.4
= $1.44x10^{1}$
07D-18 = 3200
= $3.20x10^{3}$
07D-19 = 0.176
= $1.76x10^{-1}$
07D-20 = 38.0
= $3.80x10^{1}$
07D-26 = 3.1 (2SD)
= $3.1x10^{0}$
07D-27 = $159.87
07D-28 = 2.07
= $2.07x10^{0}$
07D-29 = 17.2
= $1.72x10^{1}$
07D-30 = 0.474
= $4.74x10^{-1}$
07D-36 = 5 integer
07D-37 = $1.71x10^{-760476}$
07D-38 = 16.8
= $1.68x10^{1}$
07D-39 = 1410
= $1.41x10^{3}$
07D-40 = 100
= $1.00x10^{2}$
07D-46 = 0.217
= $2.17x10^{-1}$
07D-47 = -0.568
= $-5.68x10^{-1}$
07D-48 = 0.160
= $1.60x10^{-1}$
07D-49 = 3.55
= $3.55x10^{0}$
07D-50 = 7.69
= $7.69x10^{0}$
07D-56 = 124
= $1.24x10^{3}$
07D-57 = 12.5
= $1.25x10^{1}$
07D-58 = -7.35
= $-7.35x10^{0}$
07D-59 = 3.41
= $3.41x10^{0}$
07D-60 = 928
= $9.28x10^{2}$
07D-66 = 2.46
= $2.46x10^{0}$
07D-67 = 53.2
= $5.32x10^{1}$
07D-68 = 53.7
= $5.37x10^{0}$
07D-69 = 1.58
= $1.58x10^{0}$
07D-70 = 64.3
= $6.43x10^{1}$
07E-6 = 120
= $1.20x10^{2}$
07E-7 = $1.92
07E-8 = 9 integer
07E-9 = 2610
= $2.61x10^{3}$
07E-10 = 1.05
= $1.05x10^{0}$
07E-16 = 12
integer
07E-17 = 37.5
= $3.75x10^{1}$

07E-18 = 7.62
= 7.62×10^{0}
07E-19 = 11.1
= 1.11×10^{1}
07E-20 = 50.2
= 5.02×10^{1}
07E-26 = 55.1
= 5.51×10^{1}
07E-27 = 1570
= 1.57×10^{3}
07E-28 = 268 (3SD)
= 2.68×10^{2}
07E-29 = 293,000
= 2.93×10^{5}
07E-30 = 1.30
= 1.30×10^{0}
07E-36 = 13.6
= 1.36×10^{1}
07E-37 = 37.3
= 3.73×10^{1}
07E-38 = 576
= 5.76×10^{2}
07E-39 = 16.1
= 1.61×10^{1}
07E-40 = 3370
= 3.37×10^{3}
07E-46 = 34.7
= 3.47×10^{1}
07E-47 = 4.93
= 4.93×10^{0}
07E-48 = 2.50
= 2.50×10^{0}
07E-49 = 3.33
= 3.33×10^{0}
07E-50 = 26300
= 2.63×10^{4}
07E-56 = 62.1
= 6.21×10^{1}
07E-57 = 0.655
= 6.55×10^{-1}
07E-58 = -141
= -1.41×10^{2}
07E-59 = 1.31
= 1.31×10^{0}
07E-60 = 2.38
= 2.38×10^{0}
07F-6 = 15.0
= 1.50×10^{1}
07F-7 = 168
= 1.68×10^{2}
07F-8 = 26.0
= 2.60×10^{1}
07F-9 = 0.144
= 1.44×10^{-1}
07F-10 = 5.27
= 5.27×10^{0}
07F-16 = 8 integer
07F-17 = 125.6497 (7SD) = 1.256497×10^{2}
07F-18 = 3.38
= 3.38×10^{0}
07F-19 = 97.7
= 9.77×10^{1}
07F-20 = 0.0294
= $2.94 \times 10^{-}$
07F-26 = 4200
= 4.20×10^{3}
07F-27 = 49400
= 4.94×10^{4}
07F-28 = 1.50
= 1.50×10^{0}
07F-29 = 3.39×10^{9}
07F-30 = 0.781
= 7.81×10^{-1}
07F-36 = $2.50
07F-37 = 2.64
= 2.64×10^{0}
07F-38 = 150
= 1.50×10^{2}
07F-39 = 42.1
= 4.21×10^{1}
07F-40 = 0.151
= 1.51×10^{-1}
07F-46 = 34.6
= 3.46×10^{1}
07F-47 = 45.4
= 4.54×10^{1}
07F-48 = 0.222
= 2.22×10^{-1}
07F-49 = 2.78
= 2.78×10^{0}
07F-50 = 95.6
= 9.56×10^{1}
07F-56 = 5.63
= 5.63×10^{0}
07F-57 = 1.00
= 1.00×10^{0}
07F-58 = -4640
= -4.64×10^{3}
07F-59 = 7.39
= 7.39×10^{0}
07F-60 = 5.55
= 5.55×10^{0}
07G-6 = 16.1
= 1.61×10^{1}
07G-7 = 63,400
= 6.34×10^{4}
07G-8 = 0.564
= 5.64×10^{-1}
07G-9 = 0.144
= 1.44×10^{-1}
07G-10 = 21.9
= 2.19×10^{1}
07G-16 = 47.3
= 4.73×10^{1}
07G-17 = 50.3
= 5.03×10^{1}
07G-18 = 29.2
= 2.92×10^{1}
07G-19 = 0.581
= 5.81×10^{-1}
07G-20 = 72.0
= 7.20×10^{1}
07G-26 = 7.50
= 7.50×10^{0}
07G-27 = 891
= 8.91×10^{2}
07G-28 = 36.8
= 3.68×10^{1}
07G-29 = 10.1
= 1.01×10^{1}
07G-30 = 3.85
= 3.85×10^{0}
07G-36 = $784.81
07G-37 = 538 (3SD)
= 5.38×10^{2}
07G-38 = 21.2
= 2.12×10^{1}
07G-39 = 0.00166
= 1.66×10^{-3}
07G-40 = 0.975
= 9.75×10^{-1}
07G-46 = 14.7
= 1.47×10^{1}
07G-47 = 11 integer
07G-48 = -1.70
= -1.70×10^{0}
07G-49 = 18.0
= 1.80×10^{1}
07G-50 = 10.0
= 1.00×10^{1}
07G-56 = -11.0
= -1.10×10^{1}
07G-57 = 160
= 1.60×10^{2}
07G-58 = 18.8
= 1.88×10^{1}
07G-59 = 12.6
= 1.26×10^{1}
07G-60 = 23.6
= 2.36×10^{1}
07H-6 = $0.12
07H-7 = 14.8
= 1.48×10^{1}
07H-8 = 13.0
= 1.30×10^{1}
07H-9 = 390
= 3.90×10^{2}
07H-10 = 1210
= 1.21×10^{3}
07H-16 = 16.7
= 1.67×10^{1}
07H-17 = 24.0
= 2.40×10^{1}
07H-18 = 0.30237 (5SD) = 3.0237×10^{-1}
07H-19 = 0.866
= 8.66×10^{-1}
07H-20 =15,600,000
= 1.56×10^{7}
07H-26 = -0.885
= -8.85×10^{-1}
07H-27 = 59 integer
07H-28 = 1570
= 1.57×10^{3}
07H-29 = 0.699
= 6.99×10^{-1}
07H-30 = 1,220,000
= 1.22×10^{6}
07H-36 = 1.34×10^{5},126,205
07H-37 = 341
= 3.41×10^{2}
07H-38 = 38.3 (3SD)
= 3.83×10^{1}
07H-39 = 2.39
= 2.39×10^{0}
07H-40 = 0.850
= 8.50×10^{-1}
07H-46 = 17.8
= 1.78×10^{1}
07H-47 = 0.985
= 9.85×10^{-1}
07H-48 = 0.928
= 9.28×10^{-1}
07H-49 = 5.37
= 5.37×10^{0}

07H-50 = 18.9
= 1.89×10^{1}
07H-56 = 0.895
= 8.95×10^{-1}
07H-57 = 92.7
= 9.27×10^{1}
07H-58 = 43.0
= 4.30×10^{1}
07H-59 = 6.00
= 6.00×10^{0}
07H-60 = 27.2
= 2.72×10^{1}
07I-6 = $11.83
07I-7 = 562
integer
07I-8 = 369,000
= 3.69×10^{5}
07I-9 = 0.0135
= 1.35×10^{-2}
07I-10 = 1.76
= 1.76×10^{0}
07I-16 = 513
= 5.13×10^{2}
07I-17 = 5.70
= 5.70×10^{0}
07I-18 = 5.06
= 5.06×10^{0}
07I-19 = 9.12
= 9.12×10^{0}
07I-20 = 1460
= 1.46×10^{3}
07I-26 = 0.229
= 2.29×10^{-1}
07I-27 = 21
integer
07I-28 = 2.68
= 2.68×10^{0}
07I-29 = 1.47×10^{8}
07I-30 = 0.166
= 1.66×10^{-1}
07I-36 = 51.4
= 5.14×10^{1}
07I-37 = 9.45
= 9.45×10^{0}
07I-38 = 15.4
= 1.54×10^{1}
07I-39 = 308
= 3.08×10^{2}
07I-40 = 3.52
= 3.52×10^{0}
07I-46 = 13,800
= 1.38×10^{4}
07I-47 = 47.8
= 4.78×10^{1}
07I-48 = 0.655
= 6.55×10^{-1}
07I-49 = 1.25×10^{8}
07I-50 = 7.40
= 7.40×10^{0}
07I-56 = 0.816
= 8.16×10^{-1}
07I-57 = 2.17
= 2.17×10^{0}
07I-58 = -73.6
= -7.36×10^{1}
07I-59 = 170
= 1.70×10^{2}
07I-60 = 54.2
= 5.42×10^{1}

2008 Answers

08A-6 = 2.08
= 2.08×10^{0}
08A-7 = 10.5
= 1.05×10^{1}
08A-8 = 283
= 2.83×10^{2}
08A-9 = 11.9
= 1.19×10^{1}
08A-10 = 0.192
= 1.92×10^{-1}
08A-16 = 4.74
= 4.74×10^{0}
08A-17 = 902
= 9.02×10^{2}
08A-18 = -15.4
= -1.54×10^{1}
08A-19 = 1.04
= 1.04×10^{0}
08A-20 = 0.122
= 1.22×10^{-1}
08A-26 = 652
= 6.52×10^{2}
08A-27 = 21.8
= 2.18×10^{1}
08A-28 = 0.670
= 6.70×10^{-1}
08A-29 = 4.54×10^{7}
08A-30 = 1.33
= 1.33×10^{0}
08A-36 = 0.500
= 5.00×10^{-1}
08A-37 = 18.0
= 1.80×10^{1}
08A-38 = 0.733
= 7.33×10^{-1}
08A-39 = 14.3
= 1.43×10^{1}
08A-40 = 0.598
= 5.98×10^{-1}
08A-46 = 43
integer
08A-47 = 13.7
= 1.37×10^{1}
08A-48 = 0.434
= 4.34×10^{-1}
08A-49 = 2.06
= 2.06×10^{0}
08A-50 = 0.0958
= 9.58×10^{-2}
08A-56 = 2070
= 2.07×10^{3}
08A-57 = 1.93
= 1.93×10^{0}
08A-58 = 292,000
= 2.92×10^{5}
08A-59 = 1.80
= 1.80×10^{0}
08A-60 = 3.18
= 3.18×10^{0}
08B-6 = -0.000151
= -1.51×10^{-4}
08B-7 = 19.8
= 1.98×10^{1}
08B-8 = 12.9
= 1.29×10^{1}
08B-9 = 0.00767
= 7.67×10^{-3}
08B-10 = 133
= 1.33×10^{2}
08B-16 = -86.7
= -8.67×10^{1}
08B-17 = 756
= 7.56×10^{2} (3SD)
08B-18 = 125,000
= 1.25×10^{5}
08B-19 = 0.592
= 5.92×10^{-1}
08B-20 = 0.0125
= 1.25×10^{-2}
08B-26 = 31.3
= 3.13×10^{1}
08B-27 = -30.9
= -3.09×10^{1}
08B-28 = 6.12
= 6.12×10^{0}
08B-29 = 13.9
= 1.39×10^{1}
08B-30 = 1.83×10^{8}
08B-36 = 7.07×10^{37}
08B-37 = 9.76
= 9.76×10^{0}
08B-38 = 3.59
= 3.59×10^{0}
08B-39 = 457
= 4.57×10^{2}
08B-40 = 79.8
= 7.98×10^{1}
08B-46 = 3.02
= 3.02×10^{0}
08B-47 = 0.959
= 9.59×10^{-1}
08B-48 = 0.246
= 2.46×10^{-1}
08B-49 = 1.21
= 1.21×10^{0}
08B-50 = 13.8
= 1.38×10^{1}
08B-51 = -0.00838
= -8.38×10^{-3}
08B-52 = 3.68
= 3.68×10^{0}
08B-53 = 2.22
= 2.22×10^{0}
08B-54 = -525
= -5.25×10^{2}
08B-55 = 1.11
= 1.11×10^{0}
08B-56 = 17.9
= 1.79×10^{1}
08B-57 = 108
= 1.08×10^{2}
08B-58 = -5.10
= -5.10×10^{0}
08B-59 = 4.37
= 4.37×10^{0}
08B-60 = 9.16
= 9.16×10^{0}
08C-6 = 46.7
= 4.67×10^{1}
08C-7 = 27.9
= 2.79×10^{1}
08C-8 = 161,000
= 1.61×10^{5}
08C-9 = 2.45
= 2.45×10^{0}

08C-10 = 9.94
= 9.94×10^{0}
08C-16 = 11.8
= 1.18×10^{1}
08C-17 = 31.1
= 3.11×10^{1}
08C-18 = -18.6
= -1.86×10^{1}
08C-19 = 3.25
= 3.25×10^{0}
08C-20 = 417
= 4.17×10^{2}
08C-26 = 3.02
= 3.02×10^{0}
08C-27 = 75.1
= 7.51×10^{1}
08C-28 = 7 integer
08C-29 = 53.7
= 5.37×10^{1}
08C-30 = 5.12
= 5.12×10^{0}
08C-36 = $2.01\times10^{504,359}$
08C-37 = 7.84
= 7.84×10^{0}
08C-38 = 0.172
= 1.72×10^{-1}
08C-39 = 188
= 1.88×10^{2}
08C-40 = 0.894
= 8.94×10^{-1}
08C-46 = 1.40×10^{11}
08C-47 = 8 integer
08C-48 = 2.47
= 2.47×10^{0}
08C-49 = 0.0224
= 2.24×10^{-2}
08C-50 = 155
= 1.55×10^{2}
08C-47 = 8 integer
08C-48 = 2.47
= 2.47×10^{0}
08C-49 = 0.0224
= 2.24×10^{-2}
08C-50 = 155
= 1.55×10^{2}
08C-51 = 0.00280
= 2.80×10^{-3}
08C-52 = 5.70
= 5.70×10^{0}
08C-53 = 184
= 1.84×10^{2}
08C-54 = 1.11
= 1.11×10^{0}
08C-55 = 1.68
= 1.68×10^{0}
08C-56 = -0.595
= -5.95×10^{-1}
08C-57 = 0.318
= 3.18×10^{-1}
08C-58 = 25.8
= 2.58×10^{1}
08C-59 = 2.33
= 2.33×10^{0}
08C-60 = 26.6
= 2.66×10^{1}
08D-6 = 22.4
= 2.24×10^{1}
08D-7 = $17.32
08D-8 = 420
= 4.20×10^{2}
08D-9 = 1370
= 1.37×10^{3}
08D-10 = 562
= 5.62×10^{2}
08D-16 = 3.33
= 3.33×10^{0}
08D-17 = 0.204
= 2.04×10^{-1}
08D-18 = 0.192
= 1.92×10^{-1}
08D-19 = 11.4
= 1.14×10^{1}
08D-20 = 0.000918
= 9.18×10^{-4}
08D-26 = 26.5
= 2.65×10^{1}
08D-27 = 6.08
= 6.08×10^{0}
08D-28 = 17.6
= 1.76×10^{1}
08D-29 = 23200
= 2.32×10^{4}
08D-30 = 885
= 8.85×10^{2}
08D-36 = 0.0718
= 7.18×10^{-2}
08D-37 = 3.80
= 3.80×10^{0}
08D-38 = 2.91
= 2.91×10^{0}
08D-39 = 7.85
= 7.85×10^{0}
08D-40 = 10.6
= 1.06×10^{1}
08D-46 = 12.7
= 1.27×10^{1}
08D-47 = 2.04
= 2.04×10^{0}
08D-48 = 4.55
= 4.55×10^{0}
08D-49 = 0.0998
= 9.98×10^{-2}
08D-50 = 8.64
= 8.64×10^{0}
08D-56 = 0.754
= 7.54×10^{-1}
08D-57 = 91.9
= 9.19×10^{1}
08D-58 = -169
= -1.69×10^{2}
08D-59 = 41.9
= 4.19×10^{1}
08D-60 = 0.732
= 7.32×10^{-1}
08E-6 = 0.474
= 4.74×10^{-1}
08E-7 = 36.0
= 3.60×10^{1}
08E-8 = $130,464,000.00
08E-9 = 3.53×10^{7}
08E-10 = 0.205
= 2.05×10^{-1}
08E-16 = 33,500
= 3.35×10^{4}
08E-17 = 544 integer
08E-18 = 3.13
= 3.13×10^{0}
08E-19 = 1470
= 1.47×10^{3}
08E-20 = 0.412
= 4.12×10^{-1}
08E-26 = -0.537
= -5.37×10^{-1}
08E-27 = -1.74
= -1.74×10^{0}
08E-28 = 1.04
= 1.04×10^{0}
08E-29 = 23.2
= 2.32×10^{1}
08E-30 = 1.43×10^{-6}
08E-36 = 4.00
= 4.00×10^{0}
08E-37 = 14.7
= 1.47×10^{1}
08E-38 = 2.61
= 2.61×10^{0}
08E-39 = 0.0115
= 1.15×10^{-2}
08E-40 = 0.706
= 7.06×10^{-1}
08E-46 = -6.4
(2SD) = -6.4×10^{0}
08E-47 = 0.980
= 9.80×10^{-1}
08E-48 = -1.22
= -1.22×10^{0}
08E-49 = 1.41
= 1.41×10^{0}
08E-50 = 0.599
= 5.99×10^{-1}
08E-56 = 4.05
= 4.05×10^{0}
08E-57 = -22.2
= -2.22×10^{1}
08E-58 = 148
= 1.48×10^{2}
08E-59 = 2.87
= 2.87×10^{0}
08E-60 = 586
= 5.86×10^{2}
08F-6 = 1349 integer
08F-7 = 204
= 2.04×10^{2}
08F-8 = 18 integer
08F-9 = 0.306
= 3.06×10^{-1}
08F-10 = 23400
= 2.34×10^{4}
08F-16 = $29,271.53
08F-17 = 0.4462
(4SD) = 4.462×10^{-1}
08F-18 = 898
= 8.98×10^{2}
08F-19 = 0.804
= 8.04×10^{-1}
08F-20 = 104
= 1.04×10^{2}
08F-26 = -27.4
= -2.74×10^{1}
08F-27 = 98.3
= 9.83×10^{1}
08F-28 = 1.67×10^{8}
08F-29 = 1.89×10^{8}

08F-30 = 0.112
= $1.12x10^{-1}$
08F-36 = $7.28x10^{-441,687}$
08F-37 = -0.0281
= $-2.81x10^{-2}$
08F-38 = 513
= $5.13x10^{2}$
08F-39 = 5.85
= $5.85x10^{0}$
08F-40 = 0.302
= $3.02x10^{-1}$
08F-46 = 1.30
= $1.30x10^{0}$
08F-47 = 7.08
= $7.08x10^{0}$
08F-48 = 5.63
= $5.63x10^{0}$
08F-49 = 4.83
= $4.83x10^{0}$
08F-50 = 5.05
= $5.05x10^{0}$
08F-56 = 0.518
= $5.18x10^{-1}$
08F-57 = 10.9
= $1.09x10^{1}$
08F-58 = -2440
= $-2.44x10^{3}$
08F-59 = 0.270
= $2.70x10^{-1}$
08F-60 = 279
= $2.79x10^{2}$
08G-6 = $2.74x10^{-6}$
08G-7 = 8.71
= $8.71x10^{0}$
08G-8 = 7 integer
08G-9 = 5.83
= $5.83x10^{0}$
08G-10 = 171
= $1.71x10^{2}$
08G-16 = -6.79
= $-6.79x10^{0}$
08G-17 = 122
= $1.22x10^{2}$
08G-18 = 227
= $2.27x10^{2}$
08G-19 = 60.7
= $6.07x10^{1}$
08G-20 = 177
= $1.77x10^{2}$
08G-26 = 42 (2SD)
= $4.2x10^{1}$
08G-27 = 176
= $1.76x10^{2}$
08G-28 = 59.8
= $5.98x10^{1}$
08G-29 = 5.38
= $5.38x10^{0}$
08G-30 = 409
= $4.09x10^{2}$
08G-36 = 10.2
= $1.02x10^{1}$
08G-37 = 89.9
= $8.99x10^{1}$
08G-38 = 0.867
= $8.67x10^{-1}$
08G-39 = 5.48
= $5.48x10^{0}$
08G-40 = 84.8
= $8.48x10^{1}$
08G-46 = $1,222.82
08G-47 = 198,000
= $1.98x10^{5}$
08G-48 = -2.45
= $-2.45x10^{0}$
08G-49 = 180
= $1.80x10^{2}$
08G-50 = 0.522
= $5.22x10^{-1}$
08G-56 = 14.8
= $1.48x10^{1}$
08G-57 = 4.00
= $4.00x10^{0}$
08G-58 = -85,000
= $-8.50x10^{4}$
08G-59 = 0.941
= $9.41x10^{-1}$
08G-60 = 0.733
= $7.33x10^{-1}$
08H-6 = 16,400
= $1.64x10^{4}$
08H-7 = 2.09
= $2.09x10^{0}$
08H-8 = 9.04
= $9.04x10^{0}$
08H-9 = 10.4
= $1.04x10^{1}$
08H-10 = 397
= $3.97x10^{2}$
08H-16 = 690
= $6.90x10^{2}$
08H-17 = 261
= $2.61x10^{2}$
08H-18 = 89.6
= $8.96x10^{1}$
08H-19 = 0.0339
= $3.39x10^{-2}$
08H-20 = 53.1
= $5.31x10^{1}$
08H-26 = 0.756
= $7.56x10^{-1}$
08H-27 = 2.27
= $2.27x10^{0}$
08H-28 = 169
= $1.69x10^{2}$
08H-29 = 773
= $7.73x10^{2}$
08H-30 = 7.03
= $7.03x10^{0}$
08H-36 = 59.6
= $5.96x10^{1}$
08H-37 = 1.48
= $1.48x10^{0}$
08H-38 = 1.88
= $1.88x10^{0}$
08H-39 = 0.401
= $4.01x10^{-1}$
08H-40 = 0.442
= $4.42x10^{-1}$
08H-46 = 21.2
= $2.12x10^{1}$
08H-47 = 2059 integer
08H-48 = 1.49
= $1.49x10^{0}$
08H-49 = 1.62
= $1.62x10^{0}$
08H-50 = 2180
= $2.18x10^{3}$
08H-56 = -6.28
= $-6.28x10^{0}$
08H-57 = 156
= $1.56x10^{2}$
08H-58 = 3.78
= $3.78x10^{0}$
08H-59 = 4.05
= $4.05x10^{0}$
08H-60 = 1.42
= $1.42x10^{0}$
08I-6 = $2.97
08I-7 = 288
= $2.88x10^{2}$
08I-8 = $1.77x10^{6}$
08I-9 = 0.0157
= $1.57x10^{-2}$
08I-10 = 24.1
= $2.41x10^{1}$
08I-16 = 689 integer
08I-17 = $7.00x10^{8}$
08I-18 = -10.7
= $-1.07x10^{1}$
08I-19 = 1.32
= $1.32x10^{0}$
08I-20 = 414
= $4.14x10^{2}$
08I-26 = -2.06
(3SD) = $-2.06x10^{0}$
08I-27 = 3.04
= $3.04x10^{0}$
08I-28 = $9.33x10^{460,215}$
08I-29 = $1.30x10^{6}$
08I-30 = 5480
= $5.48x10^{3}$
08I-36 = 0.739
= $7.39x10^{-1}$
08I-37 = 4.11
= $4.11x10^{0}$
08I-38 = 11.2
= $1.12x10^{1}$
08I-39 = 747
= $7.47x10^{2}$
08I-40 = 16,500
= $1.65x10^{4}$
08I-46 = 428
(3SD) = $4.28x10^{2}$
08I-47 = 0.0786
= $7.86x10^{-2}$
08I-48 = 0.952
= $9.52x10^{-1}$
08I-49 = 102
= $1.02x10^{2}$
08I-50 = 15.3
= $1.53x10^{1}$
08I-56 = 27.7
= $2.77x10^{1}$
08I-57 = 2.80
= $2.80x10^{0}$
08I-58 = -11.4
= $-1.14x10^{1}$
08I-59 = 192
= $1.92x10^{2}$
08I-60 = 23.4
= $2.34x10^{1}$

2009 Answers

09A-6 = 3 integer
09A-7 = 95.4
= $9.54x10^{1}$
09A-8 = 7870
= $7.87x10^{3}$
09A-9 = 0.731
= $7.31x10^{-1}$
09A-10 = 53.2
= $5.32x10^{1}$
09A-16 = $5000.00
09A-17 = 23.8
= $2.38x10^{1}$
09A-18 = 95.0
= $9.50x10^{1}$
09A-19 = 19.3
= $1.93x10^{1}$
09A-20 = 6640
= $6.64x10^{3}$
09A-26 = 16.6
= $1.66x10^{1}$
09A-27 = 15.7
= $1.57x10^{1}$
09A-28 = 84.6
= $8.46x10^{1}$
09A-29 = 156
= $1.56x10^{2}$
09A-30 = 4.45
= $4.45x10^{0}$
09A-36 = 6.70
= $6.70x10^{0}$
09A-37 = 17.3
= $1.73x10^{1}$
09A-38 = 8.11
= $8.11x10^{0}$
09A-39 = 30.4
= $3.04x10^{1}$
09A-40 = 4260
= $4.26x10^{3}$
09A-46 = 69.4
= $6.94x10^{1}$
09A-47 = 6 integer
09A-48 = -3.04
= $-3.04x10^{0}$
09A-49 = 3.26
= $3.26x10^{0}$
09A-50 = 0.000283
= $2.83x10^{-4}$
09A-56 = 0.100
= $1.00x10^{-1}$
09A-57 = 36.6
= $3.66x10^{1}$
09A-58 = 1.54
= $1.54x10^{0}$
09A-59 = 912
= $9.12x10^{2}$
09A-60 = 150
= $1.50x10^{2}$
09B-6 = -21.5
= $-2.15x10^{1}$
09B-7 = $14.94
09B-8 = 2.50
= $2.50x10^{0}$
09B-9 = 4450
= $4.45x10^{3}$
09B-10 = 24.8
= $2.48x10^{1}$
09B-16 = $3.60x10^{7}$
09B-17 = 5.30
= $5.30x10^{0}$
09B-18 = 99.3
= $9.93x10^{1}$
09B-19 = 0.183
= $1.83x10^{-1}$
09B-20 = 0.0170
= $1.70x10^{-2}$
09B-26 = 17.3
= $1.73x10^{1}$
09B-27 = -0.505
(3SD) = $-5.05x10^{-1}$
09B-28 = 0.775
= $7.75x10^{-1}$
09B-29 = 0.891
= $8.91x10^{-1}$
09B-30 = 3.28
= $3.28x10^{0}$
09B-36 = 8.83
= $8.83x10^{0}$
09B-37 = 0.558
= $5.58x10^{-1}$
09B-38 = 1.53
= $1.53x10^{0}$
09B-39 = 5.19
= $5.19x10^{0}$
09B-40 = 0.679
= $6.79x10^{-1}$
09B-46 = 9.47
= $9.47x10^{0}$
09B-47 = -3.65
= $-3.65x10^{0}$
09B-48 = -1.55
= $-1.55x10^{0}$
09B-49 = 2.79
= $2.79x10^{0}$
09B-50 = 2.19
= $2.19x10^{0}$
09B-56 = 0.533
= $5.33x10^{-1}$
09B-57 = 2630
= $2.63x10^{3}$
09B-58 = -2.00
= $-2.00x10^{0}$
09B-59 = 17.3
= $1.73x10^{1}$
09B-60 = 36.9
= $3.69x10^{1}$
09E-6 = 1220
= $1.22x10^{3}$
09E-7 = 359
integer
09E-8 = 3.60
= $3.60x10^{0}$
09E-9 = 0.00591
= $5.91x10^{-3}$
09E-10 = 0.900
= $9.00x10^{-1}$
09E-16 = 437
= $4.37x10^{2}$
09E-17 = $2.99x10^{17}$
09E-18 = 1740
= $1.74x10^{3}$
09E-19 = 376
= $3.76x10^{2}$
09E-20 = 3.46
= $3.46x10^{0}$
09E-26 = 17.7
= $1.77x10^{1}$
09E-27 = 66
integer
09E-28 = 769 (3SD)
= $7.69x10^{2}$
09E-29 = 0.675
= $6.75x10^{-1}$
09E-30 = 160
= $1.60x10^{2}$
09E-36 = 0.125
= $1.25x10^{-1}$
09E-37 = 129,000
= $1.29x10^{5}$
09E-38 = 7 integer
09E-39 = 7.35
= $7.35x10^{0}$
09E-40 = 0.789
= $7.89x10^{-1}$
09E-46 = $2500.00
09E-47 = 76.7
= $7.67x10^{1}$
09E-48 = 1.77
= $1.77x10^{0}$
09E-49 = 2.93
= $2.93x10^{0}$
09E-50 = 1.58
= $1.58x10^{0}$
09E-56 = -8.11
= $-8.11x10^{0}$
09E-57 = 48.6
= $4.86x10^{1}$
09E-58 = 4.00
= $4.00x10^{0}$
09E-59 = 1.28
= $1.28x10^{0}$
09E-60 = 24.8
= $2.48x10^{1}$
09F-6 = 1.87
= $1.87x10^{0}$
09F-7 = 1.77
= $1.77x10^{0}$
09F-8 = 11.7
= $1.17x10^{1}$
09F-9 = 0.438
= $4.38x10^{-1}$
09F-10 = 15800
= $1.58x10^{4}$
09F-16 = $1.81x10^{7}$
09F-17 = 934
= $9.34x10^{2}$
09F-18 = 273
= $2.73x10^{2}$
09F-19 = 5.81
= $5.81x10^{0}$
09F-20 = 0.452
= $4.52x10^{-1}$
09F-26 = 32.0
= $3.20x10^{1}$
09F-27 = $3294.56
09F-28 = 7.1 (2SD)
= $7.1x10^{0}$
09F-29 = 2.47
= $2.47x10^{0}$
09F-30 = 1.15
= $1.15x10^{0}$
09F-36 = 7.50
= $7.50x10^{0}$
09F-37 = 22.2
= $2.22x10^{1}$
09F-38 = 0.835
= $8.35x10^{-1}$
09F-39 = 0.863
= $8.63x10^{-1}$

09F-40 = 317
= 3.17×10^{2}
09F-46 = 0.630
= 6.30×10^{-1}
09F-47 = 18
integer
09F-48 = 29.4
= 2.94×10^{1}
09F-49 = 84.0
= 8.40×10^{1}
09F-50 = 55.6
= 5.56×10^{1}
09F-56 = 0.375
= 3.75×10^{-1}
09F-57 = 3.46
= 3.46×10^{0}
09F-58 = 43.0
= 4.30×10^{1}
09F-59 = 4.56
= 4.56×10^{0}
09F-60 = 0.355
= 3.55×10^{-1}
09G-6 = 1170
= 1.17×10^{3}
09G-7 = 207
= 2.07×10^{2}
09G-8 = -1.71
= -1.71×10^{0}
09G-9 = 5.68
= 5.68×10^{0}
09G-10 = 680
= 6.80×10^{2}
09G-16 = 35.7
= 3.57×10^{1}
09G-17 = 0.397
= 3.97×10^{-1}
09G-18 = 22100
= 2.21×10^{4}
09G-19 = 0.0405
= 4.05×10^{-2}
09G-20 = 11.2
= 1.12×10^{1}
09G-26 = $945.14
09G-27 = 2.47
= 2.47×10^{0}
09G-28 = 4.56
(3SD)
= 4.56×10^{0}
09G-29 = 1020
= 1.02×10^{3}
09G-30 = 5780
= 5.78×10^{3}
09G-36 = 28.4
= 2.84×10^{1}
09G-37 =
8.96×10^{49537}
09G-38 = 0.0798
= 7.98×10^{-2}
09G-39 = 0.267
= 2.67×10^{-1}
09G-40 = 5170
= 5.17×10^{3}
09G-46 = 11
integer
09G-47 = 0.832
= 8.32×10^{-1}
09G-48 = 6.62
= 6.62×10^{0}
09G-49 = 19.9
= 1.99×10^{1}
09G-50 = 13.2
= 1.32×10^{1}
09G-56 = 79.0
= 7.90×10^{1}
09G-57 = 19.2
= 1.92×10^{1}
09G-58 = 21.0
= 2.10×10^{1}
09G-59 = 12.6
= 1.26×10^{1}
09G-60 = 0.707
= 7.07×10^{-1}
09H-6 = 240
integer
09H-7 = -69.2
= -6.92×10^{1}
09H-8 = 0.943
= 9.43×10^{-1}
09H-9 = 48.6
= 4.86×10^{1}
09H-10 = 1.27
= 1.27×10^{0}
09H-16 = 101
= 1.01×10^{2}
09H-17 = $8219.27
09H-18 = 17
integer
09H-19 = 1.01
= 1.01×10^{0}
09H-20 = 0.802
= 8.02x10
09H-26 = 2.47
= 2.47×10^{0}
09H-27 = 63.0
= 6.30×10^{1}
09H-28 = 0.628
(3SD) = 6.28×10^{-1}
09H-29 = 0.265
= 2.65×10^{-1}
09H-30 = 3.70×10^{7}
09H-36 = 36.7
= 3.67×10^{1}
09H-37 = 38.2
= 3.82×10^{1}
09H-38 = 5.42
= 5.42×10^{0}
09H-39 = 186
= 1.86×10^{2}
09H-40 = 127
= 1.27×10^{2}
09H-46 = 5.52
= 5.52×10^{0}
09H-47 = 54.8
= 5.48×10^{1}
09H-48 = -1.15
= -1.15×10^{0}
09H-49 = 3.00
= 3.00×10^{0}
09H-50 = 5.73
= 5.73×10^{0}
09H-56 = 3.50
= 3.50×10^{0}
09H-57 = 0.668
= 6.68×10^{-1}
09H-58 = 2.00
= 2.00×10^{0}
09H-59 = 0.976
= 9.76×10^{-1}
09H-60 = 4.58
= 4.58×10^{0}
09I-6 = 1830
integer
09I-7 = $16.91
09I-8 = 91800
= 9.18×10^{4}
09I-9 = 52.6
= 5.26×10^{1}
09I-10 = 2240
= 2.24×10^{3}
09I-16 = 353
= 3.53×10^{2}
09I-17 = 8.45
= 8.45×10^{0}
09I-18 = 417,000
= 4.17×10^{5}
09I-19 = 1130
= 1.13×10^{3}
09I-20 = 39.6
= 3.96×10^{1}
09I-26 =
1.190×10^{57}
(4SD)
09I-27 = 80.0
= 8.00×10^{1}
09I-28 = 0.81
(2SD) = 8.1×10^{-1}
09I-29 = 0.817
= 8.17×10^{-1}
09I-30 = 2.13
= 2.13×10^{0}
09I-36 = 11.3
= 1.13×10^{1}
09I-37 =
3.82×10^{28718}
09I-38 = 130
= 1.30×10^{2}
09I-39 = 45.8
= 4.58×10^{1}
09I-40 = 77.4
= 7.74×10^{1}
09I-46 = 5.55
= 5.55×10^{0}
09I-47 = 0.873
= 8.73×10^{-1}
09I-48 = -4.03
= -4.03×10^{0}
09I-49 = 364
= 3.64×10^{2}
09I-50 = 1.02
= 1.02×10^{0}
09I-56 = 0.696
= 6.96×10^{-1}
09I-57 = 335
= 3.35×10^{2}
09I-58 = -19.0
= -1.90×10^{1}
09I-59 = 8.38
= 8.38×10^{0}
09I-60 = 2.00
= 2.00×10^{0}