

A+ Junior High Number Sense

Test Writer's Perspective

Andy Zapata

Married

4 children

3 grandchildren

Classroom Teacher 42 years

Co-founder Texas Math and Science Coaches Association (TMSCA)

Azle Junior High – (1974 – 1982)

Azle High School – (1982 – 2016)

Physics teacher (1982 – 2016)

AP Physics reader – (2004 – 2016)

AISD Grant Writer – (2017)

High School Aerospace Scholar counselor – (2006 – 2010)

Coached – JH slide rule (1974 – 1982)

HS slide rule, number sense, calculator applications, mathematics, science (1982 – 2016)

Coached numerous high school state champions and state championship teams.

Azle HS UIL academic coordinator

2001 – 2002 UIL sponsor excellence award winner

UIL A+ Number Sense, Calculator, Mathematics consultant (2007 – present)

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Junior Problem Guidelines

Problems 1 – 20

1. Addition, subtraction, multiplication & division of whole numbers, fractions, and decimals
2. Order of operations
3. Use of the distributive property
4. Comparison of fractions & decimals
5. Multiplication short-cuts
6. Squaring numbers
7. Roman numerals/Arabic numbers
8. Mean, median, mode
9. Sums of whole numbers of multiple terms of a finite series

Problem 1 – 20

- (1) $32 \times 11 =$ _____
- (2) $21 + 22 =$ _____
- (3) $205 \div 5 =$ _____
- (4) $12 + 6 \div 3 =$ _____
- (5) $\frac{7}{12} + \frac{1}{6} =$ _____
- (6) $234 \times 0.5 =$ _____
- (7) $101 \div 0.25 =$ _____
- (8) $23^2 =$ _____
- (9) $12 \times 6 \times 5 =$ _____
- *(10) $2021 \div 0.0125 =$ _____
- (11) $15.25 \times 4 =$ _____
- (12) What is the median of 2, 6, 9 and 8? _____
- (13) Which is larger: $\frac{8}{15}$ or $\frac{13}{25}$? _____
- (14) $25 \times 38 =$ _____
- (15) $105 - 17 - 33 =$ _____
- (16) $28 \times 88 =$ _____
- (17) $176 \div 11 =$ _____
- (18) $13 + 18 + 23 + 28 =$ _____
- (19) MCMXXV = _____ (Arabic Numeral)
- *(20) $1818 \times 88 + 16 =$ _____

Junior Problem Guidelines

Problems 21 – 40

1. Addition, subtraction, multiplication & division of mixed numbers and integers
2. More multiplication short-cuts
3. Percent problems
4. Conversion problems (either way):
English/metric, length, area, capacity, time
5. Consumer type problems
6. Substitution problems
7. Solving simple equations
8. Square roots/cube roots
9. Greatest common divisor (GCD) & least common multiple (LCM)

Junior Problem Guidelines

Problems 21 – 40 (continued)

10. Number theory - prime numbers and divisors
11. Perimeter/area of: square, rectangle, circle
12. Ratio/proportion
13. Inverses
14. Multiplication of 101, 111

Problem 21 – 40

- (21) $0.25 \times 24 + 0.5 \times 24 =$ _____
- (22) If $f(x) = 3x^2 + 5$, then $f(-3) =$ _____
- (23) The ratio of ounces in 3 cups to 1 quart is _____
- (24) $6\frac{1}{3} \times 12\frac{1}{3} =$ _____ (mixed number)
- (25) $5\frac{3}{4} + 4\frac{5}{6} =$ _____
- (26) $111 \times 64 =$ _____
- (27) The negative square root of 169 is _____
- (28) If n is to 8 as 3 is to 4, then $n =$ _____
- (29) If $12 - 4x$ is 16 then $x =$ _____
- *(30) $18 \times 20 \times 22 =$ _____
- (31) $84 \times 75 =$ _____
- (32) The sum of the two largest prime numbers less than 20 is _____
- (33) If $0.75 - 0.25 = n$, the $n^{-1} =$ _____
- (34) The product of the lcm and gcd of 8 and 24 is _____
- (35) 1 mile = _____ feet
- (36) 8 percent = _____ (common fraction)
- (37) The total cost of item that costs \$160 with a sales tax of $6\frac{1}{4}\%$ is \$ _____
- (38) $46 \times 44 =$ _____
- (39) The area of an equilateral triangle with side 4-cm is $a\sqrt{3}$ and $a =$ _____ cm^2
- *(40) $19\sqrt{14400} =$ _____

Junior Problem Guidelines

Problems 41 – 60

1. Sets
2. Word problems
3. Pythagorean theorem
4. Sequences
5. Volume/surface area of rectangular solid/cube
6. Base systems: conversions and basic operations
7. Area of: parallelogram, rhombus, trapezoid, circle
8. Solving inequalities
9. Basic geometry facts
10. Remainder problems

Problem 41 – 60

- (41) 23 (base 4) = _____ (base 2)
- (42) $9^3 =$ _____
- (43) \$5 minus 3 quarters minus 4 nickels = \$ _____
- (44) What is the length of a diagonal of a rhombus with an area of 36 m^2 and other diagonal 4 m?
_____ m
- (45) 23 (base 5) – 14 (base 5) = _____ (base 5)
- (46) $72 \times 68 =$ _____
- (47) What is the length of an edge of a cube with surface area 2400? _____
- (48) $95 \times 96 =$ _____
- (49) $10 \times (0.1 + 0.2 + 0.3 + \dots + 1.0) =$ _____
- *(50) $502\pi^2 =$ _____
- (51) In the sequence: 1, 4, **a**, 16, 25, **b**, 49, ...
a – b = _____
- (52) If $\frac{1}{3}x - 12 > 15$, then $x >$ _____
- (53) What is the area of a right triangle with leg 5 cm and hypotenuse 13 cm? _____ cm^2
- (54) $23(\text{base } 5) \times 4(\text{base } 5) =$ _____ (base 5)
- (55) What number times eight and added to fifteen equals nineteen? _____
- (56) What is the area of a trapezoid with bases 26, 24 and altitude 25? _____
- (57) If set **A** = {S, A, N, M, A, R, C, O, S} and set **B** = {S, A, N, A, N, T, O, N, I, O}, then the number of elements in **A** \cap **B** is _____
- (58) $(14^2 - 8 \times 6) \div 5$ has a remainder of _____
- (59) $101 \times 243 =$ _____
- *(60) $749 \times 361 =$ _____

Junior Problem Guidelines

Problems 61 – 80

1. Repeating decimals
2. More number theory
3. Powers of numbers
4. Volume of: circular cylinder, cone, sphere
5. Sequences & series
6. Factorial
7. Coordinate geometry
8. Probability/odds
9. More percent type problems : Advanced
10. More remainder type problems
11. More multiplication short-cuts

Please note that problem types in one category should not be found in a previous category. However, problem types of one category can be found in subsequent categories.

For example, one would not expect to see the problem $\frac{4}{9} + \frac{2}{9}$ in problems 1 – 20. However, one can see this problem $\left(\frac{4}{9} + \frac{2}{9}\right)^2$ in problems 61 – 80.

Problem 61 – 80

- (61) $2 \times (2^{-1} + 2^{-2}) =$ _____
- (62) 3 miles = _____ yards
- (63) 30 miles per hour = _____ ft/sec
- (64) 20% of 55% of 100 = _____
- (65) What are the odds of picking a red queen from a standard deck of 52 cards? _____
- (66) The number of minutes between 10:12 AM and 3:30 PM of the same day is _____
- (67) How many whole numbers will evenly divide into 18? _____
- (68) $0! =$ _____
- (69) $4\frac{1}{4} \div \frac{1}{8} =$ _____
- *(70) $249700 \div 126 =$ _____
- (71) $25^2 + 75^2 =$ _____
- (72) $0.777 \dots =$ _____ (common fraction)
- (73) $0.8333 \dots =$ _____ (common fraction)
- (74) The volume of a right cylinder with length 12 and radius 4 is $k\pi$, and $k =$ _____
- (75) The fourth triangular number is _____
- (76) $286 \times 7 =$ _____
- (77) What is the distance between the points (0, 5) and (-12, 0)? _____
- (78) $\frac{8!}{6!} + 25 =$ _____
- (79) $37^2 - 26^2 =$ _____
- *(80) 15 square miles = _____ acres

Certain Facts Students Should Know!

Squares up to 25.

Cubes up to 10.

Common English measurement conversions (length, weight, area, volume, time)

American monetary conversions

Factorials up to 8!

Basic metric measurement conversions

Fraction, decimal, percent - equivalencies (thirds, fourths, fifths, sixths, eighths, ninths, elevenths, twelfths, sixteenths)

Number Sense Resources 2021 – 2022

A+ Academics Resources

This is a list of independent companies who advertise preparatory materials for UIL elementary and junior high academic contests. **The University Interscholastic League is not affiliated with any of the companies and cannot be responsible for any of their products or services.**

Number Sense Resources 2021 – 2022

AD Testing Service

Social Studies, Current Events, Accounting (NEW!), Computer Science, Number Sense, Science, Literary Criticism and Extemp Speaking

PO Box 1222, San Marcos, Texas 78667

Phone: 512-557-4621 / Fax: 214-296-9665

Web: www.itsasport.com

E-mail: adtestingservices@gmail.com or contactus@itsasport.com or sales@itsasport.com

AMT Test Writing Service

- 675 Miller Rd., Azle, TX 76020
- Phone: 817-444-3655
- Email: entermeet@gmail.com
- Offers Number Sense: Elements of Number Sense by Jim Cummings. Contains preparatory material for the Number Sense Contest. Accepts School PO's, checks, M/C, Visa, Amex, Disc.

Number Sense Resources 2021 – 2022

Best of Texas

Accounting, Calculator Applications, Computer Applications, Computer Science, Current Issues and Events, Literary Criticism, Mathematics, Number Sense, Science, Social Studies, and Spelling and Vocabulary

Peggy Markham

- 6318 Palmetto Way, San Antonio, TX 78253
- Phone: (210) 241-4734; Fax: (210) 236-9445
- Email: Peggy Markham peggy@bestoftexascontest.com
- Website: www.bestoftexascontest.com

Apps for smart phones and tablets -- both iOS and Android -- in Spelling, Social Studies, Art, and Music Memory.

Number Sense Resources 2021 – 2022

Computer Software Number Sense Computerized – by Larry White

Larry White Box 25 Millersview, Tx UIL State NS & Mathematics Contest Director

Phone:(325) 483-5446

Email: texasmath@centex.net

I have put together a group of programs that can assist you in coaching and teaching number sense shortcuts. I have completed NSC-1 containing 23 programs and NSC-2 containing 20 more programs and have another 20 in the works. The programs are excellent for beginners as well as great review for the more advanced number sense. A High School version and a Middle School version of NSC-1 and NSC-2 are available. Also, a set of 25 specially built programs for Elementary School is available.

Number Sense Resources 2021 – 2022

D&R Enterprises / Don Skow - Number Sense

booklet: *NO SENSE IN MATHEMATICS*

Don Skow, 4716 W. Monte Cristo Rd, Edinburg, TX 78541

E-mail: dps1221@hotmail.com

Dr. Numsen/Doug Ray

- PO Box 312578, New Braunfels, TX 78131
- Phone: 512-797-2158; Fax: 208-575-9617
- Email: doug@academicmeet.com
- Website: www.academicmeet.com

Provides workbooks and practice tests for elementary and junior high Number Sense, Calculator Applications, and Mathematics. Available for Workshops. Author of Mastering Number Sense and Mastering Calculator Applications workbooks. Also available: Mastering Number Sense Drill Master (online practice software) and Trick Center (online videos).

Number Sense Resources 2021 – 2022

Hexco, Inc.

- PO Box 199, Hunt, TX 78024-0199
- 800/391-2891 or 830-367-3825; Fax: 830-367-3824
- Email: hexco@hexco.com
- Website: www.hexco.com
- Supplies materials for both High School and Grade School contests – Accounting, Art, Computer Applications, Computer Science, Current Issues & Events, Dictionary Skills, Journalism, Literary Criticism, Maps Graphs and Charts, Number Sense, Oral Reading, Ready Writing, Science, Social Studies, Storytelling, and Spelling & Vocabulary. Hexco offers an array of software, videos, online flashcards, and printed products. The company also writes and sells invitational tests for 12 dates per year. Experienced authors and editors.

Joe Cuellar - Number Sense

2309 Adrian Street, Harlingen, TX 78552

956/412-8116

E-mail: jcuellar@mail.com

Number Sense Resources 2021 – 2022

Leo Ramirez, Sr.

- 9801 W. Parmer Lane #2622, Austin, TX 78717
- Phone: 956-491-3155 (cell)
- Email: toywiz127@aol.com
- Website: www.rammaterials.com/

Number Sense, Calculator Applications, Mathematics and Science practice tests, DVDS, and workbooks (including UIL, PSIA, and TMSCA Number Sense and UIL, PSIA, and TMSCA Mathematics workbooks) are available. Mr. Ramirez is also available for writing invitational meet tests and conducting workshops.

Number Sense Resources 2021 – 2022

MRC Jr.

- Jamie Pennington
- 412 Paradise Canyon Circle, Paradise, TX, 76073
- Phone: 817-403-0669
- Email: info@uiltests.com
- Website: www.uiltests.com

Offers practice test sets and invitational tests for 5th/6th and 7th/8th Grade Social Studies, Science I & II, Maps, Charts, and Graphs, Dictionary Skills, Math, and Number Sense.

Number Sense Resources

2021 – 2022

myQBook Online Preparation Programs in Number Sense and Mathematics for all levels

myQBook Meets: Monthly Free Online Meets in Number Sense and Mathematics for all levels.

- Contact: Mary Jacob
- 1008 Big Canyon Drive, Flower Mound, TX 75028
- myQBook Programs: www.myqbook.com; E-mail: info@myqbook.com; Phone: 972-968-8072
- myQBook Meets: www.myqbookmeets.org; E-mail: info@myqbookmeets.org; Phone: 214-469-9521
- **myqBook** provides complete online preparation programs in Number Sense and Mathematics for elementary, middle and high school levels. Each program offers more than 350 concept explanations with many solved sample problems and 5 to 10 additional practice questions for each concept. Each program also offers 20 full-length online tests. Visit www.myQBook.com and register with the ambassador code 2WFTNSMATH to get free trial access. Please email or call to get special discounted rates for schools.

myQBook Meets offers free monthly online meets in Number Sense and Mathematics from October to April. Monthly cash awards are given to Teachers of winning teams. Visit www.myQBookMeets.org to register your team and participate.

Number Sense Resources 2021 – 2022

Number Dojo

- Website: www.NumberDojo.com
- Email: numdojo@gmail.com
- Facebook: www.facebook.com/numberdojo

Free resources include the Number Dojo iPhone app, Number Sensei blog with over 100 concepts and free worksheets, Mathing Bee contest info, and contest maps listing information for all published number sense meets. Also flash cards, worksheets, curriculum and concept reference indexes (solution manuals) for purchase.

Texas Math & Science Coaches Association (TMSCA)

- PO Box 206, Olney TX 76374
- Phone: 940-563-1005; Fax: 940-563-1006
- Email: execsectmsca@gmail.com
- Web: www.tmsca.org

Membership provides an information forum for coaches of math/science contests; access to purchase Practice Materials and Tournaments Tests for number sense, calculator, mathematics and science for high school, middle school and elementary levels; and access to enter on-line and state meets for all grade levels.

Number Sense Resources 2021 – 2022

The Virtual Challenge High School & Middle School Meets

- Owner/Director: Chuck Thompson
- Email: cthompson1313@gmail.com
- Phone: 940-782-9898
- Website: www.virtualchallengemeets.com

Offers a statewide testing program for the following contests for grades 9 – 12:

Number Sense, Calculator, Mathematics, Science, Current Events, Social Studies, Literary Criticism, Spelling, Computer Science, Accounting.

- For grades 5-8: Number Sense, Calculator, Listening, Mathematics, Science I and II, Dictionary Skills, Maps, Graphs & Charts, Social Studies, and Spelling.
- The High School & Middle School Virtual Challenge Meets allow your team to compete in a season of 3 meets to prepare students for their UIL District Meet.
- Your combined elementary/middle school teams will enjoy unlimited entries in 16 different events in all 3 meets with no travel costs and all testing done on a customized schedule, all for one inexpensive combined Entry Fee.

Last year at the HS level, over 350 schools participated posting over 21,000 scores.