

University Interscholastic League
2023 – 2024 Elementary Number Sense Test A

Contestant's Number _____

Final		
2 nd		
1 st		
Score	Initials	

**Read Directions Carefully
Before Beginning Test**

**Do Not Unfold This Sheet
Until Told to Begin**

Directions: Do not turn this page until the person conducting this test gives the signal to begin. This is a ten-minute test. There are 80 problems. Solve accurately and quickly as many as you can in the order in which they appear. **ALL PROBLEMS ARE TO BE SOLVED MENTALLY.** Make no calculations with paper and pencil. Write only the answer in the space provided at the end of each problem. Problems marked with a (*) require approximate integral answers; any answer to a starred problem that is within five percent of the exact answer will be scored correct; all other problems require exact answers.

The person conducting this contest should explain these directions to the contestants.
Stop – Wait for Signal!

- | | |
|--|---|
| <p>(1) $6 + 41 =$ _____</p> <p>(2) $18 + 29 =$ _____</p> <p>(3) $76 - 32 =$ _____</p> <p>(4) $224 \div 2 =$ _____</p> <p>(5) $13 \times 4 =$ _____</p> <p>(6) $204 - 31 =$ _____</p> <p>(7) $9 + 11 + 13 =$ _____</p> <p>(8) $43 \times 11 =$ _____</p> <p>(9) $832 \div 8 =$ _____</p> <p>*(10) $3897 + 703 =$ _____</p> <p>(11) $25 \times 32 =$ _____</p> <p>(12) Which digit is in the hundreds place in 49317.20568? _____</p> <p>(13) $15 \times 22 =$ _____</p> <p>(14) 83670.2874 rounded to the tens place is _____</p> <p>(15) What is the remainder for $60318 \div 5$? _____</p> <p>(16) The number of whole numbers between 103 and 125 is _____</p> <p>(17) $6 \times 10^{-1} + 5 \times 10^{-2} + 1 \times 10^{-3} =$ _____ (decimal)</p> <p>(18) $33 \times 7 - 33 \times 5 =$ _____</p> <p>(19) MDCLX = _____ (Arabic Numeral)</p> | <p>*(20) $320 \times 375 =$ _____</p> <p>(21) $8 + 4 \div 2 =$ _____</p> <p>(22) $16 + 14 + 12 + 10 + 8 =$ _____</p> <p>(23) 72 hours = _____ days</p> <p>(24) Which is larger: 0.1 or $\frac{1}{9}$? _____</p> <p>(25) $\frac{7}{12} + \frac{1}{12} =$ _____</p> <p>(26) $19 \times 21 =$ _____</p> <p>(27) 44% = _____ common fraction</p> <p>(28) If 24 ♥ costs 44¢, then 36 ♥ cost _____¢</p> <p>(29) $21 \div \frac{7}{12} =$ _____</p> <p>*(30) $443 \times 359 =$ _____</p> <p>(31) 16 quarters = _____ dimes</p> <p>(32) The sum of the two smallest primes greater than 30 is _____</p> <p>(33) 2 quarts = _____ ounces</p> <p>(34) $1025 \div 25 =$ _____</p> <p>(35) $16\frac{2}{3}\%$ = _____ common fraction</p> <p>(36) The GCF of 24 and 32 is _____</p> <p>(37) $97 \times 95 =$ _____</p> |
|--|---|

- (38) $\frac{1}{12} + \frac{11}{12} - \frac{3}{12} =$ _____
- (39) The ratio, in cents, of 2 quarters to \$2 is _____
- *(40) $225 \times 439 =$ _____
- (41) $14^2 =$ _____
- (42) $6^3 =$ _____
- (43) The volume of a cube with edge 4 is _____
- (44) The perimeter of an isosceles triangle with congruent sides 18 and other side 24 is _____
- (45) $2^4 + 3^2 =$ _____
- (46) $2\frac{1}{8} \times 6\frac{1}{8} =$ _____ (mixed number)
- (47) What is the volume of a rectangular box that is 8-ft by 6-ft by 11-ft? _____ cubic feet
- (48) $37.5\% \times 64 =$ _____
- (49) If $x = \frac{2}{3}$, then $21 + 3x =$ _____
- *(50) $2023 + 2024 + 2025 =$ _____
- (51) What is the number, k , in the sequence: 0, 1, 8, k , 64, 125, ...? _____
- (52) $9\frac{4}{5} + 6\frac{9}{10} =$ _____ (mixed number)
- (53) If the radius of a circle is 48, then the circumference of the circle is _____ π
- (54) If a rectangle with area 24 has a width that measures 4, then its perimeter is _____
- (55) 23 (base 10) = _____ (base 3)
- (56) The number of days in September is _____
- (57) What is the area of a triangle with altitude $4\frac{1}{2}$ and base 24? _____
- (58) How many elements are in the power set for $\{0, 2, 4, 6, 8\}$? _____
- (59) If three times a whole number, minus nine, is thirty-three, what is the number? _____
- *(60) 150 yards = _____ inches
- (61) 1011 (base 2) = _____ (base 8)
- (62) $12 + -2^4 \times (-4) =$ _____
- (63) What is the probability a blue marble is randomly picked from a bag of 6 blue and 8 red marbles? _____
- (64) 25 cups = _____ ounces
- (65) $72^2 =$ _____
- (66) $9^6 \div 7$ has remainder of _____
- (67) The area of a rhombus with diagonals 18 and 24 is _____
- (68) If $18 - 3x > 54$, then $x <$ _____
- (69) $2\frac{1}{42} - \frac{7}{6} =$ _____
- *(70) $\sqrt{130321} =$ _____
- (71) The additive inverse of $6\frac{1}{2}$ is _____
- (72) $88^2 - 12^2 =$ _____
- (73) If $9\frac{3}{4}\%$ of x is $3\frac{1}{4}\%$ of 6, then $x =$ _____
- (74) $1^0 + 2^1 + 3^2 + 4^3 =$ _____
- (75) $33^2 + 11^2 =$ _____
- (76) $(2 + 4 + 6 + \dots + 10)^2 =$ _____
- (77) What is the area of a right triangle with hypotenuse 13 and leg 5? _____
- (78) $\sqrt{576} \times \sqrt{625} =$ _____
- (79) $24 + 24^2 =$ _____
- *(80) $25^4 =$ _____

2023 – 2024 University Interscholastic League Elementary Number Sense Test A – Key

(1) 47	*(20) 114000 – 126000	(38) $\frac{3}{4}; .75$	(59) 14
(2) 47	(21) 10	(39) $\frac{1}{4}; .25$	*(60) 5130 – 5670
(3) 44	(22) 60	*(40) 93837– 103713	(61) 13
(4) 112	(23) 3	(41) 196	(62) 76
(5) 52	(24) $\frac{1}{9}$	(42) 216	(63) $\frac{3}{7}$
(6) 173	(25) $\frac{2}{3}$	(43) 64	(64) 200
(7) 33	(26) 399	(44) 60	(65) 5184
(8) 473	(27) $\frac{11}{25}$	(45) 25	(66) 1
(9) 104	(28) 66	(46) $13\frac{1}{64}$	(67) 216
*(10) 4370 – 4830	(29) 36	(47) 528	(68) -12
(11) 800	*(30) 151086 – 166988	(48) 24	(69) $\frac{6}{7}$
(12) 3	(31) 40	(49) 23	*(70) 343 – 379
(13) 330	(32) 68	*(50) 5769 – 6375	(71) $-6\frac{1}{2}; -6.5; -\frac{13}{2}$
(14) 83670	(33) 64	(51) 27	(72) 7600
(15) 3	(34) 41	(52) $16\frac{7}{10}$	(73) 2
(16) 21	(35) $\frac{1}{6}$	(53) 96	(74) 76
(17) .651	(36) 8	(54) 20	(75) 1210
(18) 66	(37) 9215	(55) 212	(76) 900
(19) 1660		(56) 30	(77) 30
		(57) 54	(78) 600
		(58) 32	(79) 600
			*(80) 371094 – 410156

Note: *(Number) x – y means an integer between x and y inclusive.

If an answer is of the type like $\frac{2}{3}$ it cannot be written as .666... or $\overline{.6}$.

University Interscholastic League
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| <p>(1) $413 + 51 =$ _____</p> <p>(2) $5 \times 16 =$ _____</p> <p>(3) $88 - 49 =$ _____</p> <p>(4) $111 \div 3 =$ _____</p> <p>(5) $\frac{11}{16} - \frac{1}{4} =$ _____</p> <p>(6) $12 \div 0.4 =$ _____</p> <p>(7) $45 \times 11 =$ _____</p> <p>(8) $14^2 =$ _____</p> <p>(9) $24 - 16 \div 4 =$ _____</p> <p>*(10) $2023 \times 99 + 2024 =$ _____</p> <p>(11) $18 \times 22 =$ _____</p> <p>(12) If the arithmetic mean of 8, x, and 20 is 15, $x =$ _____</p> <p>(13) Which is larger: $\frac{5}{11}$ or $\frac{6}{13}$? _____</p> <p>(14) $15 \times 35 + 5 \times 35 =$ _____</p> <p>(15) $48 \times 68 =$ _____</p> <p>(16) $100 - 32 - 18 =$ _____</p> <p>(17) $33^2 =$ _____</p> <p>(18) $28 + 32 + 36 + 40 =$ _____</p> <p>(19) MMDXL = _____ (Arabic Numeral)</p> | <p>*(20) $18.75 \times 320 =$ _____</p> <p>(21) $18 \times 22 + 4 =$ _____</p> <p>(22) $101 \times 567 =$ _____</p> <p>(23) If $f(x) = -2x^2 - 15$ then $f(-4) =$ _____</p> <p>(24) $5\frac{1}{11} \times 6\frac{1}{11} =$ _____ (mixed number)</p> <p>(25) $4\frac{11}{12} + 6\frac{5}{6} =$ _____</p> <p>(26) $31 - 31^2 =$ _____</p> <p>(27) The positive square root of 625 is _____</p> <p>(28) If n is to 6 as 8 is to 3, then $n =$ _____</p> <p>(29) If $20 + 4x$ is 44, then $x =$ _____</p> <p>*(30) $229^2 =$ _____</p> <p>(31) $82 \times 88 =$ _____</p> <p>(32) The sum of the prime numbers less than 20 but greater than 11 is _____</p> <p>(33) If $1.75 + 0.5 = n$, the $n^{-1} =$ _____</p> <p>(34) 24 is divisible by how many whole numbers? _____</p> <p>(35) 3 square yards = _____ square feet</p> <p>(36) 6 percent = _____ (common fraction)</p> <p>(37) If the sales tax is $8\frac{1}{2}\%$, what is the amount of sales tax on an item that costs \$50? \$ _____</p> |
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- (38) The LCM (24, 15) \times GCF (24, 15) = _____
- (39) The area of an equilateral triangle with a side of 8-cm is $a\sqrt{3}$ and a = _____ cm²
- *(40) $1111\sqrt{9801}$ = _____
- (41) 63 (base 10) = _____ (base 5)
- (42) $5^4 + 5^3$ = _____
- (43) 649×111 = _____
- (44) What is the area of a rhombus with diagonals 120 and 100? _____
- (45) 32 (base 5) $- 4$ (base 5) = _____ (base 5)
- (46) If $30 \div 3 = n^2 + 1$, and $n > 0$, then n = _____
- (47) If $\mathbf{A} = \{2, 3, 4, 5\}$, $\mathbf{B} = \{1, 2, 4, 6\}$ and $\mathbf{C} = \{2, 4, 6\}$, how many elements are in $\mathbf{A} \cap \mathbf{C} \cap \mathbf{B}$? _____
- (48) 18 pints = _____ quarts
- (49) The surface area of a rectangular solid that measures 8 by 5 by 2 is _____
- *(50) 625×160 = _____
- (51) In the sequence: 1, 4, a , 16, 25, b , 49, . . .
 $(a - b)^2$ = _____
- (52) What is the 6th term in the sequence: 1, 4, 9, . . .? _____
- (53) The sum of the interior angles for a square is _____ $^\circ$
- (54) What is the area of a parallelogram with opposite sides each 16 and altitude between them 25? _____
- (55) What is the area of a rectangle with a perimeter of 24 and length 8? _____
- (56) What is the radius of a circle with a circumference of 100π ? _____
- (57) The hypotenuse for a triangle with sides 8, 15 is _____
- (58) $(15^2 + 8 \times 6) \div 4$ has a remainder of _____
- (59) The surface area for a cube with edge 5 is _____
- *(60) $15^4 \times 111 \div 5^3$ = _____
- (61) $(25^{-1} \times 10^2)^{-1}$ = _____
- (62) 440 yards = _____ feet
- (63) 36 km/hr = _____ meters/sec
- (64) $8\frac{1}{3}\%$ + $33\frac{1}{3}\%$ = _____ (common fraction)
- (65) $25^3 \div 7$ has a remainder of _____
- (66) $\frac{1+2+3+\dots+7}{1+3+5+\dots+9}$ = _____
- (67) The sum of the positive divisors of 20 is _____
- (68) $4!$ = _____
- (69) $5\frac{1}{4} \div \frac{3}{8}$ = _____
- *(70) 15 miles = _____ yards
- (71) $11^2 + 33^2$ = _____
- (72) $55\frac{5}{9}\%$ = _____ (common fraction)
- (73) $0.1333\dots$ = _____ (common fraction)
- (74) The surface area of a sphere with a radius of 11 is $k\pi$ and k = _____
- (75) What are the odds of randomly picking a red ball from a bag of 12 red and 18 blue balls? _____
- (76) $24^2 \times 25$ = _____
- (77) If the shortest distance between the points (0, 7) and (x, 0) is 25, what is x? _____
- (78) $12 + \frac{5!}{3!}$ = _____
- (79) $(9.5)^2 - (5.5)^2$ = _____
- *(80) 360 days = _____ hours

2023 – 2024 University Interscholastic League Junior High Number Sense Test A – Key

(1) 464	*(20) 5700 – 6300	(38) 360	(59) 150
(2) 80	(21) 400	(39) 16	*(60) 42708 – 47202
(3) 39	(22) 57267	*(40) 104490 – 115488	(61) $\frac{1}{4}$; .25
(4) 37	(23) -47	(41) 223	(62) 1320
(5) $\frac{7}{16}$; .4375	(24) $31\frac{1}{121}$	(42) 750	(63) 10
(6) 30	(25) $11\frac{3}{4}$; 11.75; $\frac{47}{4}$	(43) 72039	(64) $\frac{5}{12}$
(7) 495	(26) -930	(44) 6000	(65) 1
(8) 196	(27) 25	(45) 23	(66) $\frac{28}{25}$; $1\frac{3}{25}$; 1.12
(9) 20	(28) 16	(46) 3	(67) 42
*(10) 192186 – 212416	(29) 6	(47) 2	(68) 24
(11) 396	*(30) 49819 – 55063	(48) 9	(69) 14
(12) 17	(31) 7216	(49) 132	*(70) 25080 – 27720
(13) $\frac{6}{13}$	(32) 49	*(50) 95000 – 105000	(71) 1210
(14) 700	(33) $\frac{4}{9}$	(51) 729	(72) $\frac{5}{9}$
(15) 3264	(34) 8	(52) 36	(73) $\frac{2}{15}$
(16) 50	(35) 27	(53) 360	(74) 484
(17) 1089	(36) $\frac{3}{50}$	(54) 400	(75) $\frac{2}{3}$
(18) 136	(37) 4.25	(55) 32	(76) 14400
(19) 2540		(56) 50	(77) 24
		(57) 17	(78) 32
		(58) 1	(79) 60
			*(80) 8208 – 9072

Note: *(Number) x – y means an integer between x and y inclusive.

If an answer is of the type like $\frac{2}{3}$ it cannot be written as .666... or $\overline{.6}$.

University Interscholastic League
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|---|--|
| <p>(1) $16 + 32 =$ _____</p> <p>(2) $79 + 29 =$ _____</p> <p>(3) $85 - 23 =$ _____</p> <p>(4) $336 \div 3 =$ _____</p> <p>(5) $17 \times 5 =$ _____</p> <p>(6) $614 - 47 =$ _____</p> <p>(7) $8 + 15 + 22 =$ _____</p> <p>(8) $11 \times 27 =$ _____</p> <p>(9) $720 \div 9 =$ _____</p> <p>*(10) $2304 + 699 =$ _____</p> <p>(11) $17 \times 25 =$ _____</p> <p>(12) Which digit is in the ten-thousands place in 49317.20568? _____</p> <p>(13) $64 \times 15 =$ _____</p> <p>(14) 83670.2874 rounded to the hundredths place is _____ decimal</p> <p>(15) What is the remainder for $700126 \div 9$? _____</p> <p>(16) The number of even whole numbers between 343 and 358 is _____</p> <p>(17) $1 \times 10^{-2} + 4 \times 10^{-4} =$ _____ (decimal)</p> <p>(18) $26 \times 11 - 11 \times 21 =$ _____</p> <p>(19) MMLIX = _____ (Arabic Numeral)</p> | <p>*(20) $625 \times 239 =$ _____</p> <p>(21) $18 - 6 \div 3 =$ _____</p> <p>(22) $11 + 15 + 19 + 23 =$ _____</p> <p>(23) 12 weeks = _____ days</p> <p>(24) Which is larger: 0.33 or $\frac{1}{3}$? _____</p> <p>(25) $\frac{21}{24} - \frac{5}{24} =$ _____</p> <p>(26) $28 \times 32 =$ _____</p> <p>(27) 68% = _____ common fraction</p> <p>(28) If 48 ♥ costs 44¢, then 36 ♥ cost _____¢</p> <p>(29) $24 \div \frac{3}{8} =$ _____</p> <p>*(30) $360 \times 667 =$ _____</p> <p>(31) 75 nickels = _____ quarters</p> <p>(32) The sum of the two largest primes less than 50 is _____</p> <p>(33) 32 ounces = _____ cups</p> <p>(34) $975 \div 25 =$ _____</p> <p>(35) $8\frac{1}{3}\%$ = _____ common fraction</p> <p>(36) The LCM of 18 and 36 is _____</p> <p>(37) $93 \times 94 =$ _____</p> |
|---|--|

- (38) $\frac{7}{24} + \frac{11}{24} - \frac{9}{24} =$ _____
- (39) The ratio, in cents, of 5 dimes to 3 quarters is _____
- *(40) $161 \times 224 =$ _____
- (41) $4^3 =$ _____
- (42) $22^2 =$ _____
- (43) The volume of a cube with edge 3 is _____
- (44) The perimeter of an isosceles triangle with congruent sides 12 and other side 16 is _____
- (45) $2^5 - 3^3 =$ _____
- (46) $9\frac{1}{4} \times 7\frac{1}{4} =$ _____ (mixed number)
- (47) What is the volume of a rectangular box that is 2.25-ft by 8-ft by 11-ft? _____ cubic feet
- (48) $120 \times 12.5\% =$ _____
- (49) If $x = \frac{3}{4}$, then $15 - 8x =$ _____
- *(50) $24 \times 2024 + 2025 =$ _____
- (51) What is the number, k , in the sequence:
0, 1, 1, 2, 3, 5, 8, k , 21, 34, ...? _____
- (52) $12\frac{3}{5} - 6\frac{9}{10} =$ _____ (mixed number)
- (53) If the diameter of a circle is 48, then the area of the circle is _____ π
- (54) If a rectangle with area 32 has a length that measures 8, then its perimeter is _____
- (55) 46 (base 10) = _____ (base 5)
- (56) The number of days in December is _____
- (57) What is the area of a triangle with altitude $4\frac{1}{3}$ and base 12? _____
- (58) How many elements are in the power set for {A, U, S, T, I, N}? _____
- (59) If three times a whole number, added to six, is thirty-nine, what is the number? _____
- *(60) 1 mile = _____ inches
- (61) 1110 (base 2) = _____ (base 8)
- (62) $18 - (-2^3) \times (2) =$ _____
- (63) What is the probability a red marble is randomly picked from a bag of 16 blue and 8 red marbles? _____
- (64) 4.25 gallons = _____ pints
- (65) $82^2 =$ _____
- (66) $10^6 \div 8$ has remainder of _____
- (67) What is the perimeter of a rhombus with side 4.125? _____
- (68) If $6x - 14 > 58$, then $x >$ _____
- (69) $2\frac{4}{15} - \frac{5}{3} =$ _____
- *(70) $\sqrt{79524} =$ _____
- (71) The multiplicative inverse of $4\frac{3}{8}$ is _____
- (72) $16^2 - 24^2 =$ _____
- (73) If $6\frac{1}{2}\%$ of 12 is $2\frac{1}{6}\%$ of x , then $x =$ _____
- (74) $1^0 - 2^1 + 3^2 - 4^3 =$ _____
- (75) $8^2 + 24^2 =$ _____
- (76) $(1 + 3 + 5 + \dots + 11)^2 =$ _____
- (77) What is the area of a right triangle with hypotenuse 15 and leg 9? _____
- (78) $\sqrt{361} \times \sqrt{441} =$ _____
- (79) $29 + 29^2 =$ _____
- *(80) $15^4 =$ _____

2023 – 2024 University Interscholastic League Elementary Number Sense Test B – Key

(1) 48	*(20) 141907 – 156843	(38) $\frac{3}{8}; .375$	(59) 11
(2) 108	(21) 16	(39) $\frac{2}{3}$	*(60) 60192 – 66528
(3) 62	(22) 68	*(40) 34261– 37867	(61) 16
(4) 112	(23) 84	(41) 64	(62) 34
(5) 85	(24) $\frac{1}{3}$	(42) 484	(63) $\frac{1}{3}$
(6) 567	(25) $\frac{2}{3}$	(43) 27	(64) 34
(7) 45	(26) 896	(44) 40	(65) 6724
(8) 297	(27) $\frac{17}{25}$	(45) 5	(66) 0
(9) 80	(28) 33	(46) $67\frac{1}{16}$	(67) $16.5; 16\frac{1}{2}; \frac{33}{2}$
*(10) 2853 – 3153	(29) 64	(47) 198	(68) 12
(11) 425	*(30) 228114– 252126	(48) 15	(69) $\frac{3}{5}; .6$
(12) 4	(31) 15	(49) 9	*(70) 268 – 296
(13) 960	(32) 90	*(50) 48071 – 53131	(71) $\frac{8}{35}$
(14) 83670.29	(33) 4	(51) 13	(72) -320
(15) 7	(34) 39	(52) $5\frac{7}{10}$	(73) 36
(16) 7	(35) $\frac{1}{12}$	(53) 576	(74) -56
(17) .0104	(36) 36	(54) 24	(75) 640
(18) 55	(37) 8742	(55) 141	(76) 1296
(19) 2059		(56) 31	(77) 54
		(57) 26	(78) 399
		(58) 64	(79) 870
			*(80) 48094 – 53156

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|---|---|
| <p>(1) $23 + 102 =$ _____</p> <p>(2) $14 \times 4 =$ _____</p> <p>(3) $74 - 31 =$ _____</p> <p>(4) $248 \div 4 =$ _____</p> <p>(5) $\frac{7}{9} - \frac{2}{3} =$ _____</p> <p>(6) $10 \div 0.5 =$ _____</p> <p>(7) $11 \times 33 =$ _____</p> <p>(8) $11^2 =$ _____</p> <p>(9) $12 + 12 \div 6 =$ _____</p> <p>* (10) $223 + 2023 + 2024 =$ _____</p> <p>(11) $31 \times 29 =$ _____</p> <p>(12) If the arithmetic mean of x, 12 and 20 is 11, $x =$ _____</p> <p>(13) Which is smaller: $\frac{5}{12}$ or $\frac{3}{7}$? _____</p> <p>(14) $9 \times 15 - 5 \times 15 =$ _____</p> <p>(15) $24 \times 84 =$ _____</p> <p>(16) $59 - 16 - 14 =$ _____</p> <p>(17) $44^2 =$ _____</p> <p>(18) $11 + 15 + 19 + 23 =$ _____</p> <p>(19) MMXXIII = _____ (Arabic Numeral)</p> | <p>* (20) $187.5 \times 160 =$ _____</p> <p>(21) $39 \times 41 + 1 =$ _____</p> <p>(22) $234 \times 101 =$ _____</p> <p>(23) If $f(x) = -2x^2 + 10$ then $f(-1) =$ _____</p> <p>(24) $8\frac{1}{10} \times 2\frac{1}{10} =$ _____ (mixed number)</p> <p>(25) $2\frac{5}{6} + 3\frac{2}{3} =$ _____</p> <p>(26) $15 - 15^2 =$ _____</p> <p>(27) The negative square root of 361 is _____</p> <p>(28) If n is to 12 as 5 is to 6, then $n =$ _____</p> <p>(29) If $11 + 5x$ is 36, then $x =$ _____</p> <p>* (30) $310^2 =$ _____</p> <p>(31) $52 \times 58 =$ _____</p> <p>(32) The sum of the prime numbers greater than 0 but less than 11 is _____</p> <p>(33) If $2.25 - 0.5 = n$, the $n^{-1} =$ _____</p> <p>(34) 18 is divisible by how many whole numbers? _____</p> <p>(35) 2 square feet = _____ square inches</p> <p>(36) 8 percent = _____ (common fraction)</p> <p>(37) If the sales tax is $8\frac{1}{2}\%$, what is the amount of sales tax on an item that costs \$20? \$ _____</p> |
|---|---|

- (38) The LCM (12, 16) \times GCF (12, 16) = _____
- (39) The area of an equilateral triangle with a side of 2-cm is $a\sqrt{3}$ and a = _____ cm²
- *(40) $111\sqrt{19600}$ = _____
- (41) 34 (base 5) = _____ (base 10)
- (42) $4^3 - 3^2$ = _____
- (43) 58×111 = _____
- (44) What is the area of a rhombus with diagonals 64 and 60? _____
- (45) 42 (base 6) $- 5$ (base 6) = _____ (base 6)
- (46) If $24 \div 6 = n^2 - 12$, and $n > 0$, then n = _____
- (47) If $\mathbf{A} = \{1, 2, 3, 4\}$, $\mathbf{B} = \{0, 1, 2, 3\}$ and $\mathbf{C} = \{4, 2, 0\}$, how many elements are in $\mathbf{A} \cap \mathbf{C} \cap \mathbf{B}$? _____
- (48) 24 pints = _____ quarts
- (49) The surface area of a rectangular solid that measures 6 by 1 by 4 is _____
- *(50) 240×624 = _____
- (51) In the sequence: 2, 4, a , 8, 10, b , 14, . . .
 $(b - a)^2$ = _____
- (52) What is the 6th term in the sequence: 1, 3, 5, . . .? _____
- (53) Each exterior angle for a square is _____ $^\circ$
- (54) What is the area of a parallelogram with opposite sides each 10 and altitude between them 25? _____
- (55) What is the area of a rectangle with a perimeter of 30 and length 9? _____
- (56) What is the radius of a circle with a circumference of 64π ? _____
- (57) The hypotenuse for a triangle with sides 10, 24 is _____
- (58) $(23^2 + 15 \times 4) \div 5$ has a remainder of _____
- (59) If the surface area for a cube is 216, its edge is _____
- *(60) $24^4 \times 101 \div 4^3$ = _____
- (61) $(5^{-1} \times 5^2)^{-1}$ = _____
- (62) 366 feet = _____ yards
- (63) 18 km/hr = _____ meters/sec
- (64) $16\frac{2}{3}\%$ + $44\frac{4}{9}\%$ = _____ (common fraction)
- (65) $15^3 \div 6$ has a remainder of _____
- (66) $\frac{1+2+3+\dots+6}{2+4+6+\dots+10}$ = _____
- (67) The sum of the positive divisors of 12 is _____
- (68) $5!$ = _____
- (69) $4\frac{1}{2} \div \frac{3}{8}$ = _____
- *(70) 11 miles = _____ yards
- (71) $12^2 + 24^2$ = _____
- (72) $45\frac{5}{11}\%$ = _____ (common fraction)
- (73) $0.0333\dots$ = _____ (common fraction)
- (74) The volume of a sphere with a diameter of 6 is $k\pi$ and k = _____
- (75) What are the odds of randomly picking a blue ball from a bag of 20 red and 18 blue balls? _____
- (76) $12^2 \times 25$ = _____
- (77) If the shortest distance between the points (15, 0) and (0, x) is 17, what is x ? _____
- (78) $11 \times \frac{6!}{4!}$ = _____
- (79) $(3.5)^2 - (7.5)^2$ = _____
- *(80) 750 hours = _____ minutes

2023 – 2024 University Interscholastic League Junior High Number Sense Test B – Key

(1) 125	*(20) 28500 – 31500	(38) 192	(59) 6
(2) 56	(21) 1600	(39) 1	*(60) 497405 – 549763
(3) 43	(22) 23634	*(40) 14763 – 16317	(61) $\frac{1}{5}; .2$
(4) 62	(23) 8	(41) 19	(62) 122
(5) $\frac{1}{9}$	(24) $17\frac{1}{100}$	(42) 55	(63) 5
(6) 20	(25) $6\frac{1}{2}; 6.5; \frac{13}{2}$	(43) 6438	(64) $\frac{11}{18}$
(7) 363	(26) -210	(44) 1920	(65) 3
(8) 121	(27) -19	(45) 33	(66) $\frac{7}{10}; .7$
(9) 14	(28) 10	(46) 4	(67) 28
*(10) 4057 – 4483	(29) 5	(47) 1	(68) 120
(11) 899	*(30) 91295 – 100905	(48) 12	(69) 12
(12) 1	(31) 3016	(49) 68	*(70) 18392 – 20328
(13) $\frac{5}{12}$	(32) 17	*(50) 142272 – 157248	(71) 720
(14) 60	(33) $\frac{4}{7}$	(51) 36	(72) $\frac{5}{11}$
(15) 2016	(34) 6	(52) 11	(73) $\frac{1}{30}$
(16) 29	(35) 288	(53) 270	(74) 36
(17) 1936	(36) $\frac{2}{25}$	(54) 250	(75) $\frac{9}{10}; .9$
(18) 68	(37) 1.70	(55) 54	(76) 3600
(19) 2023		(56) 32	(77) 8
		(57) 26	(78) 330
		(58) 4	(79) -44
			*(80) 42750 – 47250

Note: *(Number) x – y means an integer between x and y inclusive.

If an answer is of the type like $\frac{2}{3}$ it cannot be written as .666... or $\overline{.6}$.

University Interscholastic League
2023 – 2024 Elementary Number Sense Test C

Contestant's Number _____

Final		
2 nd		
1 st		
	Score	Initials

**Read Directions Carefully
Before Beginning Test**

**Do Not Unfold This Sheet
Until Told to Begin**

Directions: Do not turn this page until the person conducting this test gives the signal to begin. This is a ten-minute test. There are 80 problems. Solve accurately and quickly as many as you can in the order in which they appear. **ALL PROBLEMS ARE TO BE SOLVED MENTALLY.** Make no calculations with paper and pencil. Write only the answer in the space provided at the end of each problem. Problems marked with a (*) require approximate integral answers; any answer to a starred problem that is within five percent of the exact answer will be scored correct; all other problems require exact answers.

The person conducting this contest should explain these directions to the contestants.
Stop – Wait for Signal!

- | | |
|--|--|
| <p>(1) $13 + 51 =$ _____</p> <p>(2) $28 + 86 =$ _____</p> <p>(3) $96 - 44 =$ _____</p> <p>(4) $510 \div 5 =$ _____</p> <p>(5) $19 \times 7 =$ _____</p> <p>(6) $703 - 54 =$ _____</p> <p>(7) $9 + 12 + 15 =$ _____</p> <p>(8) $11 \times 45 =$ _____</p> <p>(9) $360 \div 4 =$ _____</p> <p>*(10) $2023 + 599 =$ _____</p> <p>(11) $18 \times 25 =$ _____</p> <p>(12) Which digit is in the ten-thousandths place in 49317.20568? _____</p> <p>(13) $44 \times 15 =$ _____</p> <p>(14) 83670.2874 rounded to the tenths place is _____ decimal</p> <p>(15) What is the remainder for $70226 \div 9$? _____</p> <p>(16) The number of even whole numbers between 104 and 118 is _____</p> <p>(17) $2 \times 10^{-2} + 9 \times 10^{-3} =$ _____ (decimal)</p> <p>(18) $32 \times 12 - 12 \times 28 =$ _____</p> <p>(19) MMDIX = _____ (Arabic Numeral)</p> | <p>*(20) $625 \times 120 =$ _____</p> <p>(21) $9 - 6 \div 3 =$ _____</p> <p>(22) $13 + 17 + 21 + 25 =$ _____</p> <p>(23) 13 weeks = _____ days</p> <p>(24) Which is larger: 0.66 or $\frac{2}{3}$? _____</p> <p>(25) $\frac{17}{24} - \frac{5}{24} =$ _____</p> <p>(26) $18 \times 22 =$ _____</p> <p>(27) 72% = _____ common fraction</p> <p>(28) If 48 ♥ costs 60¢, then 36 ♥ cost _____¢</p> <p>(29) $48 \div \frac{3}{8} =$ _____</p> <p>*(30) $120 \times 667 =$ _____</p> <p>(31) 60 nickels = _____ quarters</p> <p>(32) The sum of the two largest primes less than 40 is _____</p> <p>(33) 40 ounces = _____ cups</p> <p>(34) $825 \div 25 =$ _____</p> <p>(35) $41\frac{2}{3}\%$ = _____ common fraction</p> <p>(36) The LCM of 12 and 24 is _____</p> <p>(37) $91 \times 95 =$ _____</p> |
|--|--|

- (38) $\frac{11}{24} + \frac{7}{24} - \frac{3}{24} =$ _____
- (39) The ratio, in cents, of 6 dimes to 3 quarters is _____
- *(40) $232 \times 225 =$ _____
- (41) $5^3 =$ _____
- (42) $23^2 =$ _____
- (43) The volume of a cube with edge 5 is _____
- (44) The perimeter of an isosceles triangle with congruent sides 18 and other side 24 is _____
- (45) $4^3 - 3^3 =$ _____
- (46) $4\frac{1}{2} \times 2\frac{1}{2} =$ _____ (mixed number)
- (47) What is the volume of a rectangular box that is 2.25-ft by 4-ft by 12-ft? _____ cubic feet
- (48) $800 \times 12.5\% =$ _____
- (49) If $x = \frac{3}{4}$, then $24 - 4x =$ _____
- *(50) $10 \times 2024 + 2025 =$ _____
- (51) What is the number, k , in the sequence: 0, 1, 1, 2, 3, 5, k , 13, 21, . . . ? _____
- (52) $8\frac{1}{5} - 5\frac{7}{10} =$ _____ (mixed number)
- (53) If the diameter of a circle is 44, then the area of the circle is _____ π
- (54) If a rectangle with area 28 has a length that measures 14, then its perimeter is _____
- (55) 48 (base 10) = _____ (base 5)
- (56) The number of days in March is _____
- (57) What is the area of a triangle with altitude $4\frac{1}{3}$ and base 18? _____
- (58) How many elements are in the power set for $\{T, E, N\}$? _____
- (59) If four times a whole number, added to six, is thirty-eight, what is the number? _____
- *(60) 12 miles = _____ yards
- (61) 1001 (base 2) = _____ (base 8)
- (62) $18 - (-2^4) \times (2) =$ _____
- (63) What is the probability a red marble is randomly picked from a bag of 22 blue and 8 red marbles? _____
- (64) 4.75 gallons = _____ pints
- (65) $69^2 =$ _____
- (66) $10^5 \div 8$ has remainder of _____
- (67) What is the perimeter of a rhombus with side 6.125? _____
- (68) If $6x - 14 > 46$, then $x >$ _____
- (69) $2\frac{4}{35} - \frac{7}{5} =$ _____
- *(70) $\sqrt{115600} =$ _____
- (71) The multiplicative inverse of $4\frac{5}{8}$ is _____
- (72) $21^2 - 29^2 =$ _____
- (73) If $6\frac{1}{2}\%$ of 12 is $1\frac{5}{8}\%$ of x , then $x =$ _____
- (74) $1^0 + 2^1 - 3^2 + 4^3 =$ _____
- (75) $12^2 + 36^2 =$ _____
- (76) $(2 + 4 + 6 + \dots + 10)^2 =$ _____
- (77) What is the area of a right triangle with hypotenuse 26 and leg 24? _____
- (78) $\sqrt{324} \times \sqrt{484} =$ _____
- (79) $39 + 39^2 =$ _____
- *(80) $16^4 =$ _____

2023 – 2024 University Interscholastic League Elementary Number Sense Test C – Key

(1) 64	*(20) 71250 – 78750	(38) $\frac{5}{8}$; .625	(59) 8
(2) 114	(21) 7		*(60) 20064 – 22176
(3) 52	(22) 76	(39) $\frac{4}{5}$; .8	(61) 11
(4) 102	(23) 91		(62) 50
(5) 133	(24) $\frac{2}{3}$	*(40) 49590– 54810	(63) $\frac{4}{15}$
(6) 649	(25) $\frac{1}{2}$; .5	(41) 125	(64) 38
(7) 36	(26) 396	(42) 529	(65) 4761
(8) 495	(27) $\frac{18}{25}$	(43) 125	(66) 0
*(10) 2491 – 2753	(28) 45	(44) 60	(67) $24.5; 24\frac{1}{2}; \frac{49}{2}$
(11) 450	(29) 128	(45) 37	(68) 10
(12) 6	*(30) 76038– 84042	(46) $11\frac{1}{4}$	(69) $\frac{5}{7}$
(13) 660	(31) 12	(47) 108	*(70) 323 – 357
(14) 83670.3	(32) 68	(48) 100	(71) $\frac{8}{37}$
(15) 8	(33) 5	(49) 21	(72) -400
(16) 6	(34) 33	*(50) 21152 – 23378	(73) 48
(17) .029	(35) $\frac{5}{12}$	(51) 8	(74) 58
(18) 48	(36) 24	(52) $2\frac{1}{2}$	(75) 1440
(19) 2509	(37) 8645	(53) 484	(76) 900
		(54) 32	(77) 120
		(55) 143	(78) 396
		(56) 31	(79) 1560
		(57) 39	*(80) 62260 – 68812
		(58) 8	

Note: *(Number) x – y means an integer between x and y inclusive.

If an answer is of the type like $\frac{2}{3}$ it cannot be written as .666... or $\overline{.6}$.

University Interscholastic League
2023 – 2024 Junior High Number Sense Test C

Contestant's Number _____

Final		
2 nd		
1 st		
Score	_____	_____
	Initials	_____

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The person conducting this contest should explain these directions to the contestants.
Stop – Wait for Signal!

- | | |
|--|--|
| <p>(1) $34 + 105 =$ _____</p> <p>(2) $13 \times 4 =$ _____</p> <p>(3) $95 - 42 =$ _____</p> <p>(4) $336 \div 3 =$ _____</p> <p>(5) $\frac{7}{8} - \frac{1}{4} =$ _____</p> <p>(6) $20 \div 0.5 =$ _____</p> <p>(7) $11 \times 44 =$ _____</p> <p>(8) $12^2 =$ _____</p> <p>(9) $8 + 8 \div 4 =$ _____</p> <p>*(10) $224 + 2024 + 2042 =$ _____</p> <p>(11) $41 \times 39 =$ _____</p> <p>(12) If the arithmetic mean of x, 10 and 9 is 13, $x =$ _____</p> <p>(13) Which is smaller: $\frac{6}{13}$ or $\frac{1}{2}$? _____</p> <p>(14) $8 \times 11 - 3 \times 11 =$ _____</p> <p>(15) $26 \times 86 =$ _____</p> <p>(16) $100 - 22 - 18 =$ _____</p> <p>(17) $55^2 =$ _____</p> <p>(18) $9 + 14 + 19 + 24 =$ _____</p> <p>(19) MMXXIV = _____ (Arabic Numeral)</p> | <p>*(20) $187.5 \times 480 =$ _____</p> <p>(21) $29 \times 31 + 1 =$ _____</p> <p>(22) $123 \times 101 =$ _____</p> <p>(23) If $f(x) = -2x^2 + 10$ then $f(-2) =$ _____</p> <p>(24) $6\frac{1}{10} \times 4\frac{1}{10} =$ _____ (mixed number)</p> <p>(25) $3\frac{7}{8} + 4\frac{3}{4} =$ _____</p> <p>(26) $13 - 13^2 =$ _____</p> <p>(27) The negative square root of 529 is _____</p> <p>(28) If n is to 8 as 3 is to 6, then $n =$ _____</p> <p>(29) If $12 + 5x$ is 42, then $x =$ _____</p> <p>*(30) $190^2 =$ _____</p> <p>(31) $42 \times 48 =$ _____</p> <p>(32) The sum of the prime numbers greater than 5 but less than 15 is _____</p> <p>(33) If $3.5 - 0.75 = n$, the $n^{-1} =$ _____</p> <p>(34) 12 is divisible by how many whole numbers? _____</p> <p>(35) 10 square feet = _____ square inches</p> <p>(36) 2 percent = _____ (common fraction)</p> <p>(37) If the sales tax is $8\frac{1}{2}\%$, what is the amount of sales tax on an item that costs \$100? \$ _____</p> |
|--|--|

- (38) The LCM (18, 16) \times GCF (18, 16) = _____
- (39) The area of an equilateral triangle with a side of 4-cm is $a\sqrt{3}$ and a = _____ cm²
- *(40) $111\sqrt{28900}$ = _____
- (41) 43 (base 6) = _____ (base 10)
- (42) $2^4 - 3^2$ = _____
- (43) 47×111 = _____
- (44) What is the area of a rhombus with diagonals 58 and 60? _____
- (45) 43 (base 6) $- 5$ (base 6) = _____ (base 6)
- (46) If $36 \div 9 = n^2 - 21$, and $n > 0$, then n = _____
- (47) If $\mathbf{A} = \{0, 1, 2, 3\}$, $\mathbf{B} = \{1, 2, 3, 4\}$ and $\mathbf{C} = \{2, 4, 0\}$, how many elements are in $\mathbf{A} \cap \mathbf{C} \cap \mathbf{B}$? _____
- (48) 32 pints = _____ quarts
- (49) The surface area of a rectangular solid that measures 4 by 2 by 3 is _____
- *(50) 320×624 = _____
- (51) In the sequence: 2, 4, a , 8, 10, b , 14, . . .
 $(b + a)^2$ = _____
- (52) What is the 6th term in the sequence: 2, 4, 6, . . .? _____
- (53) Each exterior exterior angle for a equilateral triangle is _____ $^\circ$
- (54) What is the area of a parallelogram with opposite sides each 20 and altitude between them 15? _____
- (55) What is the area of a rectangle with a perimeter of 24 and length 9? _____
- (56) What is the radius of a circle with a circumference of 36π ? _____
- (57) The hypotenuse for a triangle with sides 12, 9 is _____
- (58) $(23^2 + 18 \times 4) \div 6$ has a remainder of _____
- (59) If the surface area for a cube is 54, its edge is _____
- *(60) $12^4 \times 101 \div 4^3$ = _____
- (61) $(4^{-1} \times 2^3)^{-1}$ = _____
- (62) 126 feet = _____ yards
- (63) 54 km/hr = _____ meters/sec
- (64) $25\% + 62\frac{1}{2}\%$ = _____ (common fraction)
- (65) $23^3 \div 6$ has a remainder of _____
- (66) $\frac{1+2+3+\dots+5}{2+4+6+\dots+10}$ = _____
- (67) The sum of the positive divisors of 15 is _____
- (68) $3!$ = _____
- (69) $2\frac{1}{4} \div \frac{3}{8}$ = _____
- *(70) 25 miles = _____ yards
- (71) $13^2 + 26^2$ = _____
- (72) $54\frac{6}{11}\%$ = _____ (common fraction)
- (73) $0.2333\dots$ = _____ (common fraction)
- (74) The volume of a sphere with a radius of 3 is $k\pi$ and k = _____
- (75) What are the odds of randomly picking a blue ball from a bag of 30 red and 24 blue balls? _____
- (76) $20^2 \times 25$ = _____
- (77) If the shortest distance between the points (12, 0) and (0, x) is 15, what is x ? _____
- (78) $11 \times \frac{5!}{3!}$ = _____
- (79) $(2.5)^2 - (3.5)^2$ = _____
- *(80) 24 hours = _____ seconds

2023 – 2024 University Interscholastic League Junior High Number Sense Test C – Key

(1) 139	*(20) 85500 – 94500	(38) 288	(59) 3
(2) 52	(21) 900	(39) 4	*(60) 31088 – 34360
(3) 53	(22) 12423	*(40) 17927 – 19813	(61) $\frac{1}{2}$; .5
(4) 112	(23) 2	(41) 27	(62) 42
(5) $\frac{5}{8}$; .625	(24) $25\frac{1}{100}$	(42) 7	(63) 15
(6) 40	(25) $8\frac{5}{8}$; 8.625; $\frac{69}{8}$	(43) 5217	(64) $\frac{7}{8}$
(7) 484	(26) -156	(44) 1740	(65) 5
(8) 144	(27) -23	(45) 34	(66) $\frac{1}{2}$; .5
(9) 10	(28) 4	(46) 5	(67) 24
*(10) 4076 – 4504	(29) 6	(47) 1	(68) 6
(11) 1599	*(30) 34295 – 37905	(48) 16	(69) 6
(12) 20	(31) 2016	(49) 52	*(70) 41800 – 46200
(13) $\frac{6}{13}$	(32) 31	*(50) 189696 – 209664	(71) 845
(14) 55	(33) $\frac{4}{11}$	(51) 324	(72) $\frac{6}{11}$
(15) 2236	(34) 6	(52) 12	(73) $\frac{7}{30}$
(16) 60	(35) 1440	(53) 300	(74) 36
(17) 3025	(36) $\frac{1}{50}$	(54) 300	(75) $\frac{4}{5}$; .8
(18) 66	(37) 8.50	(55) 27	(76) 10000
(19) 2024		(56) 18	(77) 9
		(57) 15	(78) 220
		(58) 1	(79) -6
			*(80) 82080 – 90720

Note: *(Number) x – y means an integer between x and y inclusive.

If an answer is of the type like $\frac{2}{3}$ it cannot be written as .666... or $\overline{.6}$.