

2018-2019 TMSCA Middle School Number Sense Regional Qualifier

- (1) $648 \div 8 =$ _____
- (2) $2019 \times 9 =$ _____
- (3) $937 - 364 =$ _____
- (4) $\frac{9}{250} =$ _____ (decimal)
- (5) $\frac{2}{3} \times 87 =$ _____
- (6) $357124 \div 9$ has a remainder of _____
- (7) $\frac{6}{11} + \frac{3}{7} =$ _____ (fraction)
- (8) $(14 + 22 + 30 + 38 + 46) \div 6 =$ _____
- (9) $23 \times 12 =$ _____
- *(10) $324 \times 18 =$ _____
- (11) $75 \times 52 =$ _____
- (12) $1600 = 32 \times 44 + 32 \times$ _____
- (13) $66 \times 104 + 41 \times 104 =$ _____
- (14) $92 \times 94 =$ _____
- (15) $55^2 =$ _____
- (16) $14 \times 8\frac{1}{2} =$ _____
- (17) $\frac{65 \times 52}{5 \times 4} =$ _____
- (18) $1 + 2 + 3 + 4 + \dots + 22 =$ _____
- (19) $84 \times 16\frac{2}{3} =$ _____
- *(20) $2019 + 20199 - 12345 =$ _____
- (21) $8\frac{1}{3} \% =$ _____ (fraction)
- (22) $37 \times 96 =$ _____
- (23) $7\frac{2}{3} - 1\frac{1}{2} =$ _____ (mixed number)
- (24) $647 \times 101 =$ _____
- (25) The multiplicative inverse of 2.25 is _____
- (26) 17 quarts + 5 pints = _____ pints
- (27) The LCM of 24 and 54 is _____
- (28) The sum of the distinct prime divisors of 105 is _____
- (29) $6396 \div 82 =$ _____
- *(30) $279 \times 879 =$ _____
- (31) $\frac{15!}{13!} =$ _____
- (32) $14 \times 14 + 28 \times 28 =$ _____
- (33) If $5x + 7 = 67$, then $5x - 3 =$ _____
- (34) $34 \div 4\frac{1}{4} =$ _____
- (35) What is the median of the smallest nine prime numbers? _____
- (36) If a rectangle with integer sides has area 48 and perimeter 32, then the longer side is _____
- (37) $2 + 4 + 6 + \dots + k = 930$, then $k =$ _____
- (38) 124 has _____ positive integral divisors
- (39) $\frac{5}{3} + 3\frac{3}{5} =$ _____ (mixed number)
- *(40) $\sqrt{478312} =$ _____
- (41) $8\frac{1}{3} \times 4\frac{1}{3} =$ _____ (mixed number)
- (42) $\sqrt{6241} =$ _____
- (43) $2x + 3 = 28$, then $4x^2 - 9 =$ _____
- (44) $94 \times 102 =$ _____
- (45) $77^2 + 73^2 =$ _____

- (46) If $184^3 \div 8^3 = k^3$, then $k =$ _____
- (47) $14 \times \frac{5}{8} =$ _____ (mixed number)
- (48) $65^2 - 33^2 = 49 \times$ _____
- (49) If the sum of the measures of the interior angles of an n -sided polygon is 3600° , then $n =$ _____
- *(50) $419324 \div 501 =$ _____
- (51) A 7-element set has _____ subsets
- (52) $29 \times \frac{27}{23} =$ _____ (mixed number)
- (53) The slope of a line passing through $(2, 3)$ and $(-4, -9)$ is _____
- (54) The harmonic mean of 5 and 12 is _____
- (55) The area of a square with diagonal $7\sqrt{6}$ is _____
- (56) $63_9 + 78_9 =$ _____,
- (57) $8585 = x^2 + 64^2$, $x > 0$, $x =$ _____
- (58) The positive difference of the roots of $|x - 9| + 3 = 14$ is _____
- (59) If $2^{5x+1} = 4^{x-3}$, then $x =$ _____
- *(60) The diagonal of a square with side 1400 has a length of _____
- (61) If $121_b = 196_{10}$, then $b =$ _____
- (62) $12^{17} \div 17$ has a remainder of _____
- (63) If $f(x) = 4x + b$ has an x -intercept of -7 , then $b =$ _____
- (64) If the midpoint of $(-1, 5)$ and $(8, 3)$ is (a, b) , then $a + b =$ _____
- (65) If $Ax + By = C$ is perpendicular to $y = \frac{2}{5}x + 3$, then $\frac{A}{B} =$ _____
- (66) If 11×16 is equal to the n th pentagonal number, then $n =$ _____
- (67) The number of integral solutions of $|x - 3| + 11 \leq 27$ is _____
- (68) How many distinct triangles can be drawn from a given vertex of an undecagon? _____
- (69) $2^3 + 4^3 + 6^3 = 2^3(k)$. $k =$ _____
- *(70) $95^3 =$ _____
- (71) The x^3 coefficient of $(2x^2 + 3x - 5)(6x^2 - 4x - 2)$ is _____
- (72) The axis of symmetry of $f(x) = (3x - 4)(2x - 1)$ is $x =$ _____
- (73) The area of an equilateral triangle with side $6\sqrt{3}$ is $k\sqrt{3}$, $k =$ _____
- (74) How many integers between 4 and 11 are relatively prime to 11? _____
- (75) $f(x) = -3(x - 1)^2 - 5$ has _____ real roots
- (76) How many distinct 6-letter arrangements can be made using all the letters from the word "PASSES" ? _____
- (77) The y -intercept of $f(x) = 3x^3 - 5x^2 + 11x + d$ is $(0, 9)$. The product of the roots is _____
- (78) The area of a 45-45-90 right triangle with hypotenuse 18 is _____
- (79) $\frac{4}{60} - \left(\frac{1}{42} + \frac{1}{56} + \frac{1}{72}\right) =$ _____
- *(80) $\sqrt[3]{1800000} =$ _____

2018-2019 TMSCA Middle School Number Sense Regional Qualifier Key

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|---------------------|------------------------|--|---|
| (1) 81 | (24) 65347 | (46) 23 | |
| (2) 18171 | (25) $\frac{4}{9}$ | (47) $8\frac{3}{4}$ | (65) $\frac{5}{2}, 2\frac{1}{2}$, or 2.5 |
| (3) 573 | (26) 39 | (48) 64 | (66) 11 |
| (4) .036 | (27) 216 | (49) 22 | (67) 33 |
| (5) 58 | (28) 15 | * (50) 796 – 878 | (68) 45 |
| (6) 4 | (29) 78 | (51) 128 | (69) 36 |
| (7) $\frac{75}{77}$ | * (30) 232979 – 257503 | (52) $34\frac{1}{23}$ | * (70) 814507 – 900243 |
| (8) 25 | (31) 210 | (53) 2 | (71) 10 |
| (9) 276 | (32) 980 | (54) $\frac{120}{17}$ or $7\frac{1}{17}$ | (72) $\frac{11}{12}$ |
| * (10) 5541 – 6123 | (33) 57 | (55) 147 | (73) 27 |
| (11) 3900 | (34) 8 | (56) 152 | (74) 6 |
| (12) 6 | (35) 11 | (57) 67 | (75) 0 |
| (13) 11128 | (36) 12 | (58) 22 | (76) 120 |
| (14) 8648 | (37) 60 | (59) $-\frac{7}{3}$ or $-2\frac{1}{3}$ | (77) – 3 |
| (15) 3025 | (38) 6 | * (60) 1881 – 2078 | (78) 81 |
| (16) 119 | (39) $5\frac{4}{15}$ | (61) 13 | (79) $\frac{1}{90}$ |
| (17) 169 | * (40) 658 – 726 | (62) 12 | * (80) 116 – 127 |
| (18) 253 | (41) $36\frac{1}{9}$ | (63) 28 | |
| (19) 1400 | (42) 79 | (64) $\frac{15}{2}, 7\frac{1}{2}$, or 7.5 | |
| * (20) 9380 – 10366 | (43) 616 | | |
| (21) $\frac{1}{12}$ | (44) 9588 | | |
| (22) 3552 | (45) 11258 | | |
| (23) $6\frac{1}{6}$ | | | |