

2018 – 2019 TMSCA Middle School Number Sense State Test

- (1) $2007 + 2013 + 2019 + 2025 + 2031 =$ _____
- (2) $72 \times 6 =$ _____
- (3) $758580 \div 5 =$ _____
- (4) $484 \times 25 =$ _____
- (5) $76 \times 11 =$ _____
- (6) $96531 \div 9$ has a remainder of _____
- (7) $46 \times 13 =$ _____
- (8) $27^2 =$ _____
- (9) $\frac{3}{8} \times 256 =$ _____
- *(10) $737 + 7377 + 73777 =$ _____
- (11) $55^2 =$ _____
- (12) $\frac{3}{7} + \frac{5}{11} =$ _____ (fraction)
- (13) $2625 = 35 \times$ _____
- (14) The mean of the smallest five prime numbers is _____ (decimal)
- (15) $11^3 =$ _____
- (16) $9\frac{1}{6}\% =$ _____ (fraction)
- (17) $49 \times 63 + 31 \times 63 =$ _____
- (18) Which is greater $\frac{2}{15}$ or $\frac{5}{39}$? _____
- (19) $189 \times 37 =$ _____
- *(20) $222.22 \times 405 =$ _____
- (21) $1 + 2 + 3 + 4 + \dots + 80 =$ _____
- (22) $8556 = 92 \times$ _____
- (23) $497 \times 101 =$ _____
- (24) 16 gallons + 1 quart = _____ pints
- (25) How many prime numbers are between 50 and 60? _____
- (26) The LCM of 28 and 70 is _____
- (27) The area of a rhombus with diagonals 42 and 21 is _____
- (28) $83472 \div 11$ has a remainder of _____
- (29) $39 \div 3\frac{1}{4} =$ _____
- *(30) 62.49% of 128301 is _____
- (31) An 8-element set has _____ subsets
- (32) $53^2 + 25^2 =$ _____
- (33) If $\frac{3x-1}{2} + 4 = 20$, then $x =$ _____
- (34) $4^8 \times 5^{12}$ has _____ positive integral divisors
- (35) $30\frac{3}{16} = 5\frac{1}{4} \times$ _____ (mixed number)
- (36) How many fractions between 1 and 4 have a denominator of 9 with an integer numerator? _____
- (37) Find the sum of the smallest 15 multiples of 6. _____
- (38) $423_{12} =$ _____₁₀
- (39) $1\frac{3}{7} + \frac{7}{3} =$ _____ (mixed number)
- *(40) $\sqrt{7839914} =$ _____
- (41) $\sqrt{6889} =$ _____
- (42) The sum of the positive integral divisors of $3^2 \times 11$ is _____
- (43) $8^2 + 24^2 + 8^2 + 16^2 =$ _____
- (44) $63^2 + 67^2 =$ _____
- (45) $0.363636\dots =$ _____ (fraction)

(46) The 8th pentagonal number is _____

(47) The area of a rectangle with length 15 and perimeter 52 is _____

(48) If $f(x) = 4x^2 + 20x + 25$ and $f(k) = 1225$, then the smaller value of k . _____

(49) The sum of the interior angles of a dodecagon exceeds the sum of the interior angles of a heptagon by _____.

*(50) The area of a square with diagonal $85\sqrt{6}$ is _____

(51) $43 \times 23 + 20^2 - 3^2 =$ _____

(52) $23 \times \frac{27}{29} =$ _____ (mixed number)

(53) $432_8 + 267_8 =$ _____₈

(54) A regular polygon with an exterior angle of 60° has how many distinct diagonals? _____

(55) If $f(x) = ax^2 + c$ and $f(21) - f(19) = 560$, then $a =$ _____

(56) The set $\{a,c,e,h,l,o,x\}$ has how many subsets with either 2 elements or 5 elements? _____

(57) $\frac{1+3+5+7+\dots+k}{1+3+5+\dots+11} = 8^2$, $k =$ _____

(58) The sequence 4, 11, 18, 25, ... , k has 26 terms, find the value of k . _____

(59) $(43_6)^2 =$ _____₆

*(60) The inner diagonal of a rectangular solid with length 61, width 60, and height 11 is _____

(61) The first 4 digits in the decimal expansion of $\frac{49}{90}$ is 0. _____

(62) The sum of the solutions of $|x - 13| = 15$ is _____

(63) $\frac{1}{3} - \left(\frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \frac{1}{42}\right) =$ _____

(64) If the roots of $f(x) = x^2 + bx + c$ are $5 + \sqrt{7}$ and $5 - \sqrt{7}$, then $b =$ _____

(65) The sum of the integral solutions of $|x - 5| \leq 8$ is _____

(66) ${}_{11}P_4 + 1 = k^2$, where $k > 0$. $k =$ _____

(67) The x^2 coefficient of $(2x^2 - 3x + 2)(4x + 9)$ is _____

(68) If $3^{3x+9} = 27^{4x-3}$, then $x =$ _____

(69) How many positive integers less than or equal to 36 are relatively prime to 36? _____

*(70) The surface area of a sphere with radius 35 is _____

(71) If $f(x) = (x - 5)(x - 9)$, then $f(x - 3)$ has a product of the roots of _____

(72) How many distinct triangles can be drawn from a given vertex of a hexagon? _____

(73) $7^{13} \div 13$ has a remainder of _____

(74) $-3x^2 + 7x + 5 = 0$ has how many real roots? _____

(75) If $f(x^2 + 1) = 5x + 7$ and $f(26) = p$, then the sum of the possible values of p is _____

(76) $307^2 =$ _____

(77) $x^2 + 5x - 15 = 0$ has roots P and Q , then the harmonic mean of P and Q is _____

(78) If $x^2 - 2xy + y^2 = 45$, $xy = 9$, and $x + y > 0$, then $x + y =$ _____

(79) Find the probability of rolling a sum of 7 or 8 when rolling a pair of 6-sided die. _____

*(80) How many positive integer ordered pairs are solutions of $2x + 3y = 9000$? _____

2018-2019 TMSCA Middle School Number Sense State Test Key

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|-----------------------|-----------------------|------------------------|----------------------|
| (1) 10095 | | (46) 92 | (63) $\frac{1}{7}$ |
| (2) 432 | (25) 2 | | |
| (3) 151716 | (26) 140 | (47) 165 | (64) - 10 |
| (4) 12100 | (27) 441 | (48) - 20 | (65) 85 |
| (5) 836 | (28) 4 | | (66) 89 |
| (6) 6 | (29) 12 | (49) 900 | (67) 6 |
| (7) 598 | *(30) 76167 - 84184 | | (68) 2 |
| (8) 729 | (31) 256 | *(50) 20592 - 22758 | (69) 12 |
| (9) 96 | (32) 3434 | (51) 1380 | |
| *(10) 77797 - 85985 | (33) 11 | (52) $21\frac{12}{29}$ | *(70) 14625 - 16163 |
| (11) 3025 | (34) 221 | (53) 721 | (71) 96 |
| (12) $\frac{68}{77}$ | (35) $5\frac{3}{4}$ | (54) 9 | (72) 10 |
| (13) 75 | | (55) 7 | (73) 7 |
| | (36) 26 | | (74) 2 |
| (14) 5.6 | (37) 720 | (56) 42 | (75) 14 |
| (15) 1331 | | (57) 95 | (76) 94249 |
| (16) $\frac{11}{120}$ | (38) 603 | (58) 179 | (77) 6 |
| (17) 5040 | (39) $3\frac{16}{21}$ | (59) 3213 | (78) 9 |
| (18) $\frac{2}{15}$ | *(40) 2660 - 2939 | *(60) 82 - 90 | |
| (19) 6993 | (41) 83 | | (79) $\frac{11}{36}$ |
| *(20) 85500 - 94499 | (42) 156 | (61) 5444 | |
| (21) 3240 | (43) 960 | (62) 26 | *(80) 1425 - 1573 |
| (22) 93 | (44) 8458 | | |
| (23) 50197 | | | |
| (24) 130 | (45) $\frac{4}{11}$ | | |