

2019-2020 TMSCA Middle School Number Sense Test #4

- (1) $243 - 185 =$ _____
- (2) $23 \times 14 =$ _____
- (3) $6488 \div 8 =$ _____
- (4) $92 \times 75 =$ _____
- (5) $54 \times 12 =$ _____
- (6) $28357 \div 7$ has a remainder of _____
- (7) $224 \times 6 =$ _____
- (8) $9^3 =$ _____
- (9) $\frac{2}{3} =$ _____ %(mixed number)
- *(10) $2734 - 836 - 999 =$ _____
- (11) $3009 = 51 \times$ _____
- (12) $84^2 =$ _____
- (13) $9.3 =$ _____ (improper fraction)
- (14) $37 \times 936 = 111 \times$ _____
- (15) The mean of the smallest 6 prime numbers is _____
- (16) $3\frac{1}{2} \times 54 =$ _____
- (17) $\frac{1+2+3+\dots+24}{1+2+3+\dots+12} =$ _____
- (18) $115^2 =$ _____
- (19) $88 \times 37\frac{1}{2} =$ _____
- *(20) $635 \times 332 =$ _____
- (21) $94 \times 9.2 =$ _____ (decimal)
- (22) $47 \times 53 =$ _____
- (23) $70 \times 7.3 =$ _____
- (24) $15 \times 3\frac{7}{15} =$ _____
- (25) $119 + 117 + 115 + \dots + 1 =$ _____
- (26) What is the smallest two digit number that has a remainder of 5 when divided by 14 and 21? _____
- (27) The reciprocal of 3.1 is _____ (fraction)
- (28) The largest prime divisor of 777 is _____
- (29) $6! \div 8$ has a remainder of _____
- *(30) 20 miles = _____ feet
- (31) 111 has how many positive integral divisors? _____
- (32) $\left(\frac{5}{8}\right)^3 =$ _____ (fraction)
- (33) $13\frac{7}{13} \times 13\frac{6}{13} =$ _____ (mixed number)
- (34) If $4x + 3 = 35$, then $12x =$ _____
- (35) $(7^2 + 42 \div 6) \div 4$ has a remainder of _____
- (36) $\frac{13}{17} + \frac{17}{13} =$ _____ (mixed number)
- (37) $10\frac{3}{5} \times 9\frac{2}{5} =$ _____ (mixed number)
- (38) A trapezoid with bases of 17 and x has a median of 12, x = _____
- (39) How many fractions between $\frac{1}{3}$ and 3 have a denominator of 12 with an integer numerator? _____
- *(40) $\sqrt{318245} =$ _____
- (41) If 45% of 72 = A% of 15, then A = _____
- (42) The largest root of $|3x - 1| = 17$ is _____
- (43) $\sqrt{15376} =$ _____
- (44) $16 \times 18 + 6 \times 18 =$ _____

(45) $1 + 3 + 5 + \dots + 83 = k^2$, $k > 0$. $k =$ _____

(46) $1^3 + 2^3 + 3^3 + 4^3 + 5^3 =$ _____

(47) The exterior angle of a regular 45-sided polygon is _____°

(48) If $f(x) = 3x^2 - 8x + 13$, then $f(6) =$ _____

(49) If $f(x) = \sqrt{3x + 13}$, and $f(a) = 11$, then $a =$ _____

*(50) $\sqrt[3]{100000} =$ _____

(51) The area of a circle with radius 10.2 is $k\pi$, $k =$ _____

(52) $\frac{28}{23} \times 28 =$ _____ (mixed number)

(53) $0.848484\dots =$ _____ (common fraction)

(54) Find the slope of the perpendicular bisector of the line containing A(4, 2) and B(9, -2). _____

(55) $1 + 1 + 2 + 3 + 5 + 8 + 13 + 21 =$ _____

(56) $43_5 + 334_5 =$ _____₅

(57) The geometric mean of 45 and 10 is $a\sqrt{b}$, where b has no perfect square divisors greater than 1, $a =$ _____

(58) If $f(x) = 43x$, then $f(17) + f(19) + f(21) =$ _____

(59) The shorter leg of a right triangle with hypotenuse 65 and longer leg 63 is _____

*(60) $97^3 =$ _____

(61) The coefficient of the x^4 term of $(x + 1)(x + 2)(x + 3)(x + 4)(x + 5)$ is _____

(62) $3^8 \times 9^5 \times 81^k = 3^{50}$, $k =$ _____

(63) If $6^{x+2} = 28\frac{4}{5}$, then $6^x =$ _____

(64) The first 4 digits in the expansion of $\frac{23}{90}$ is 0. _____

(65) If the roots of $x^2 + bx + c = 0$ are $3 - 7i$ and $3 + 7i$, then $c =$ _____

(66) An 83-sided polygon has _____ distinct diagonals

(67) A trapezoid with bases of 10 and 18 and a height of 12 has its height change to 23, what is the corresponding change in area? _____

(68) How many triangles can be drawn from a given vertex of a 20-sided polygon? _____

(69) If $\frac{a}{b} + \frac{b}{a} = 2\frac{16}{77}$ and a and b are relatively prime, then the greater of a and b is _____

*(70) $65^3 =$ _____

(71) $1 + 2 + 4 + 8 + \dots + 2^9 =$ _____

(72) $32^2 + 224^2 =$ _____

(73) $904^2 =$ _____

(74) If $f(x)$ is a parabola with vertex (11, 5), then $2f(x - 3) + k$ has vertex (14, 31). $k =$ _____

(75) $12^8 \div 7$ has a remainder of _____

(76) $f(x) = 2x^3 - 7x^2 + 2x + 8$. $f(6) =$ _____

(77) $12^{\frac{1}{2}} \times 48^{\frac{1}{2}} =$ _____

(78) $f(x) = x^3 + bx^2 + cx + d$ has roots P, Q and R. The geometric mean of P, Q, and R is 6. $d =$ _____

(79) $53_8 =$ _____₂

*(80) $3 \cdot 14^6 =$ _____

2019-2020 TMSCA Middle School Number Sense Test 4 Key

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|--|--------------------------|--|-----------------------|
| (1) 58 | (24) 52 | (45) 42 | |
| (2) 322 | (25) 3600 | (46) 225 | (64) 2555 |
| (3) 811 | | | |
| (4) 6900 | (26) 47 | (47) 8 | (65) 58 |
| | (27) $\frac{10}{31}$ | (48) 73 | (66) 3320 |
| (5) 648 | (28) 37 | (49) 36 | |
| (6) 0 | (29) 0 | *(50) 45 – 48 | |
| (7) 1344 | *(30) 100320 – 110880 | | (67) 154 |
| (8) 729 | (31) 4 | (51) 104.04, $104\frac{1}{25}$, $\frac{2601}{25}$ | (68) 171 |
| (9) $66\frac{2}{3}$ | (32) $\frac{125}{512}$ | (52) $34\frac{2}{23}$ | |
| *(10) 855 – 943 | | (53) $\frac{28}{33}$ | (69) 11 |
| (11) 59 | (33) $182\frac{42}{169}$ | | *(70) 260894 – 288356 |
| (12) 7056 | (34) 96 | (54) $\frac{5}{4}$, $1\frac{1}{4}$, or 1.25 | (71) 1023 |
| (13) $\frac{93}{10}$ | (35) 0 | (55) 54 | (72) 51200 |
| (14) 312 | (36) $2\frac{16}{221}$ | (56) 432 | (73) 817216 |
| | (37) $99\frac{16}{25}$ | | (74) 21 |
| (15) $\frac{41}{6}$ or $6\frac{5}{6}$ | | (57) 15 | (75) 4 |
| (16) 189 | (38) 7 | (58) 2451 | (76) 200 |
| (17) $\frac{50}{13}$ or $3\frac{11}{13}$ | (39) 31 | | |
| (18) 13225 | *(40) 536 – 592 | (59) 16 | (77) 24 |
| (19) 3300 | | *(60) 867040 – 958306 | |
| *(20) 200279 – 221361 | (41) 216 | | |
| (21) 864.8 | (42) 6 | (61) 15 | (78) – 216 |
| (22) 2491 | (43) 124 | (62) 8 | (79) 101011 |
| (23) 511 | (44) 396 | (63) $\frac{4}{5}$ or .8 | *(80) 911 – 1006 |