T M S C A   M I D D L E   S C H O O L

N U M B E R   S E N S E

T E S T   # 5 ©

N O V E M B E R   1 8 ,   2 0 1 7

GENERAL DIRECTIONS

1. Write only the requested information on this coversheet. Do not make any additional marks on this cover sheet.
2. You will be given 10 minutes to take this test.
3. There are 80 problems on the test.
4. Write in ink only! It would be advantageous to use non-black ink.
5. Solve as many problems as you can in the order that they appear.
6. Problems that are skipped are considered wrong.
7. Problems that appear after the last attempted problem do not count either for or against you.
8. ALL PROBLEMS ARE TO BE SOLVED MENTALLY! [No scratch work!]
9. Only the answer may be written in the answer blank.
10. Starred [*] problems require approximate INTEGRAL answers that are within 5% of the exact answers. All other problems require exact answers.
11. All problems answered correctly are worth FIVE points. FOUR points will be deducted for all problems answered incorrectly or skipped before the last problem attempted.

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2017 – 2018 TMSCA Middle School Number Sense Test 5

(1) $432 + 698 =$ _____

(2) $83 \times 50 =$ _____

(3) $0.4 =$ _____ (fraction)

(4) $54 \times 11 =$ _____

(5) $18 \times 12 =$ _____

(6) $124 \div 7$ has a remainder of_____

(7) $\dfrac{4+8+12+16+20}{4} =$ _____

(8) $\dfrac{8}{25} =$ _____(decimal)

(9) $\dfrac{9}{11} \times 121 =$ _____

*(10) $25 + 257 + 2579 =$ _____

(11) Which of the following is greater $\dfrac{18}{25}$ or $\dfrac{7}{10}$? _____

(12) $116 \times 114 =$ _____

(13) $66\dfrac{2}{3} \times 87 =$ _____

(14) The mode of 1,1,3,4,2,3,4,2,2,7 is _____

(15) $14 \times 92 + 16 \times 92 =$ _____

(16) $\dfrac{1+3+5+...+35}{9} =$ _____

(17) $97 \times 17 =$ _____

(18) $2018 \times 12 =$ _____

(19) $28 \times 32 =$ _____

*(20) $777 \times 719 =$ _____

(21) $32^2 =$ _____

(22) $98 \times 99 =$ _____

(23) $11^3 =$ _____

(24) $7234 \times 11 =$ _____

(25) $28 \times 111 =$ _____

(26) The GCF of 84 and 96 is _____

(27) $17^2 \div 9$ has a remainder of _____

(28) The area of a rectangle with width 15 and height 25 is_____

(29) The sum of the composite numbers in the set {15,16,17,18,19} is_____

*(30) $19^3 + 20^3 + 21^3 =$ _____

(31) Find the area of a right triangle with base 18 and height 24._____

(32) If 5 burgers cost $5.50, then a dozen burgers cost $ _____

(33) $19^2 + 57^2 =$ _____

(34) $72^2 + 13^2 =$ _____

(35) The product of the prime numbers in the set {15,16,17,18,19} is_____

(36) 84 has how many positive integral divisors?_____

(37) $\dfrac{5}{11} + \dfrac{11}{5} =$ _____ (mixed number)

(38) $9\dfrac{4}{7} \times 9\dfrac{3}{7} =$ _____(mixed number)

(39) If $134^2 = 17956$, then $139 \times 129 =$ _____

*(40) $2018^2 =$ _____

(41) $\sqrt{4096} =$ _____

(42) A set with 4 elements has _____subsets

(43) The area of a square with diagonal $7\sqrt{6}$ is_____

(44) $f(x) = 4x^2 - 7x + 4.$ f(3) =_____

(45) **The sum of the**
       interior angles of an undecagon is _____°

(46) **How many triangles can be drawn**
       using any three vertices of a hexagon?_____

(47) 734_{11} = _____ $_{10}$

(48) **If** $1 + 3 + 5 + \ldots + k = 28^2$**, then k = _____**

(49) **The sum of the solutions of** $|x + 4| = 7$ **is_____**

*(50) $\sqrt{562 \times 529}$ = _____

(51) **A set with 7 elements has how many**
       subsets with an even number of elements?_____

(52) $12 \times \dfrac{13}{16}$ =_____**(mixed number)**

(53) $77^2 - 33^2$ =_____

(54) **The area of a**
       regular hexagon with side 16 is $k\sqrt{3}$**, k =_____**

(55) $4 + 11 + 18 + 25 + \ldots + 60$ =_____

(56) **If** $f(x) = 14x + 4$ **, then** $f(19) - f(3)$ **= _____**

(57) $283_9 - 35_9$ =_____ $_9$

(58) $(9^4 + 7^4) \div 7$ **has a remainder of _____**

(59) $1 + 2 + 3 + \ldots + 49$ =_____

*(60) $98 \times 97 \times 94$ =_____

(61) **If** $x < 0$ **and** $x^4 = 256$**, then** x^3 **= _____**

(62) **If** $f(x) = x^2 + 5$**, then** $f(13) - f(7)$ **= _____**

(63) **The sum of the infinite**
       geometric series, $20 + 15 + 11.25 + \ldots$ **=____ ____**

(64) $9021 = 93 \times$ _____

(65) **If** $12^2 + 24^2 + 12^2 + 36^2 = (12^2)$ **k, then k =_____**

(66) $0.343434\ldots$ =_____ _____**(fraction)**

(67) **If** $11 \le 5x + 1 \le 106$**, then x**
       has how many integer solutions?_____

(68) **Find the sum of the**
       13th **and** 14th **triangular number. _____**

(69) $1_8 + 2_8 + 3_8 + \ldots + 11_8$ =_____ $_8$

*(70) **The area of a circle with radius 32 is _____**

(71) **The number of positive integral divisors less**
       than 38 that are relatively prime to 38 is_____

(72) **If the sum of the coefficients**
       in the expansion of $(5x - 2)^4$ **is_____**

(73) **The sum of the**
       integral solutions of $|x + 3| \le 13$ **is_____**

(74) $\log_6 9 + \log_6 16 - \log_6 4$ =_____

(75) **f(x) is a parabola with a vertex**
       of (3, – 2) and g(x) = 4f(x – 2) + 5.
       g(x) has a vertex of (h,k). h =_____

(76) **Find the probability of choosing a perfect**
       cube from the smallest 30 positive integers. _____

(77) $\dfrac{(n+3)!}{(n-2)!}$ **is a polynomial of degree_____**

(78) **If** $f(x) = (x^2 - 3x - 2)(x^2 - 4x + 4)$**,**
       then f(x) has how many distinct real roots? _____

(79) **P and Q are roots of** $4x^2 - 17x + 10 = 0$**.**
       The arithmetic mean of P and Q is _____

*(80) **A cone with a height of 25**
       and radius of 6 has a volume of _____

2017-2018 TMSCA Middle School Number Sense Key #5

(1) 1130

(2) 4150

(3) $\frac{2}{5}$

(4) 594

(5) 216

(6) 5

(7) 15

(8) .32

(9) 99

*(10) 2718 – 3004

(11) $\frac{18}{25}$

(12) 13224

(13) 5800

(14) 2

(15) 2760

(16) 36

(17) 1649

(18) 24216

(19) 896

*(20) 530730 – 586596

(21) 1024

(22) 9702

(23) 1331

(24) 79574

(25) 3108

(26) 12

(27) 1

(28) 375

(29) 49

*(30) 22914 – 25326

(31) 216

(32) 13.20

(33) 3610

(34) 5353

(35) 323

(36) 12

(37) $2\frac{36}{55}$

(38) $90\frac{12}{49}$

(39) 17931

*(40) 3868708 – 4275940

(41) 64

(42) 16

(43) 147

(44) 19

(45) 1620

(46) 20

(47) 884

(48) 55

(49) – 8

*(50) 518 – 572

(51) 64

(52) $9\frac{3}{4}$

(53) 4840

(54) 384

(55) 288

(56) 224

(57) 247

(58) 2

(59) 1225

*(60) 848886 – 938242

(61) – 64

(62) 120

(63) 80

(64) 97

(65) 15

(66) $\frac{34}{99}$

(67) 20

(68) 196

(69) 55

*(70) 3057 – 3377

(71) 18

(72) 81

(73) – 81

(74) 2

(75) 5

(76) $\frac{1}{10}$

(77) 5

(78) 3

(79) $\frac{17}{8}$, $2\frac{1}{8}$, or 2.125

*(80) 896 – 989