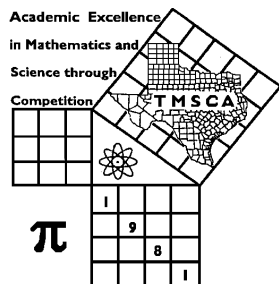


1st Score: _____	2nd Score: _____	3rd Score: _____	<b>Final Score</b>
Grader: _____	Grader: _____	Grader: _____	
<b>PLACE LABEL BELOW</b>			
Name: _____		School: _____	
SS/ID Number: _____		City: _____	
Grade: 4 5 6 7 8	Classification: 1A 2A 3A 4A 5A 6A		



## TMSCA MIDDLE SCHOOL NUMBER SENSE

TEST # 1 ©

OCTOBER 19, 2019

### 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.



## 2019-2020 TMSCA Middle School Number Sense Test #1

- (1)  $2020 + 2022 + 2024 + 2026 =$  \_\_\_\_\_
- (2)  $19 \times 14 =$  \_\_\_\_\_
- (3)  $16 + 18 - 11 + 12 =$  \_\_\_\_\_
- (4)  $637 \div 7 =$  \_\_\_\_\_
- (5)  $95 \times 25 =$  \_\_\_\_\_
- (6)  $48\% =$  \_\_\_\_\_ (fraction)
- (7)  $21347 \div 11$  has a remainder of \_\_\_\_\_
- (8)  $961854 \div 6 =$  \_\_\_\_\_
- (9)  $49 \times 0.25 =$  \_\_\_\_\_ (decimal)
- \*(10)  $273 \times 2020 =$  \_\_\_\_\_
- (11)  $49 \times 69 =$  \_\_\_\_\_
- (12)  $83 \div 5 =$  \_\_\_\_\_ (mixed number)
- (13)  $37 \times 63 =$  \_\_\_\_\_
- (14)  $111 \times 96 = 37 \times$  \_\_\_\_\_
- (15)  $\frac{18 \times 14 \times 35}{2 \times 6 \times 7} =$  \_\_\_\_\_
- (16)  $1500 = 50 \times 7 + 50 \times 11 + 50 \times$  \_\_\_\_\_
- (17) The median of 3, 5, 13, 24, 9, and 15 is \_\_\_\_\_
- (18)  $168 \times 12\frac{1}{2} =$  \_\_\_\_\_
- (19)  $108 \times 109 =$  \_\_\_\_\_
- \*(20)  $143 \times 635 + 523 \times 635 =$  \_\_\_\_\_
- (21)  $98 \div 3.5 =$  \_\_\_\_\_
- (22)  $45 \times (21 \times 3 + 7) \div 5 =$  \_\_\_\_\_
- (23)  $11536 = 103 \times$  \_\_\_\_\_
- (24) The multiplicative inverse of 0.6 is \_\_\_\_\_ (mixed number)
- (25) The cube root of the cube root of 512 is \_\_\_\_\_
- (26)  $\frac{4}{5} + \frac{3}{4} =$  \_\_\_\_\_ (decimal)
- (27) The square root of 8464 is \_\_\_\_\_
- (28)  $438 \times 101 =$  \_\_\_\_\_
- (29) 43 base 7 = \_\_\_\_\_ base 10
- \*(30)  $18^4 =$  \_\_\_\_\_
- (31) There are \_\_\_\_\_ primes between 30 and 45.
- (32) 245 has \_\_\_\_\_ positive integral divisors
- (33)  $11.2 \times 11.8 =$  \_\_\_\_\_ (mixed number)
- (34) How much does a \$80 item cost that is on sale for 12.5% off? \$ \_\_\_\_\_
- (35) If the mean of 12, 52, and x is 32, then x = \_\_\_\_\_
- (36)  $\frac{9}{13} + 1\frac{4}{9} =$  \_\_\_\_\_ (mixed number)
- (37) The 6<sup>th</sup> hexagonal number is \_\_\_\_\_
- (38) If  $f(x) = x^2 - 10x + 25$  and  $f(108) =$  \_\_\_\_\_
- (39)  $14 \times 3.142857142857\dots =$  \_\_\_\_\_
- \*(40)  $\sqrt{8324176} =$  \_\_\_\_\_
- (41) 85% of 88 is 17% of \_\_\_\_\_
- (42) The vertex angle in an isosceles triangle with base angle  $28^\circ$  is \_\_\_\_\_ $^\circ$
- (43) 123 millimeters + 123 cm = \_\_\_\_\_ meters
- (44) How many edges does a cube have? \_\_\_\_\_
- (45)  $(2 + 4 + 6 + \dots + 48) - (2 + 4 + 6 + \dots + 18) =$  \_\_\_\_\_

- (46) The diagonal of a square with side  $7\sqrt{18}$  is \_\_\_\_\_
- (47) The measure of an exterior angle of a regular undecagon is \_\_\_\_\_ $^{\circ}$
- (48)  $83^2 + 22^2 =$  \_\_\_\_\_
- (49) If  $f(x) = \frac{x^3+3x^2+3x+1}{x+1}$ , then  $f(4) =$  \_\_\_\_\_
- \*(50)  $5\frac{1}{5} \times 483 =$  \_\_\_\_\_
- (51) How many subsets does  $\{w,a,s,h,i,n,g,t,o\}$  have that contain exactly 3 elements? \_\_\_\_\_
- (52)  $\frac{15}{17} \times 12 =$  \_\_\_\_\_ (mixed number)
- (53) The area of an equilateral triangle with side 15 is  $k\sqrt{3}$ ,  $k =$  \_\_\_\_\_ (decimal)
- (54) If  $4x + By = 11$  has a slope of  $\frac{1}{3}$ , then  $B =$  \_\_\_\_\_
- (55)  $15\frac{1}{3} \times 12\frac{1}{3} =$  \_\_\_\_\_ (mixed number)
- (56)  $243_5 \times 11_5 =$  \_\_\_\_\_<sub>5</sub>
- (57) If 3, x, 9, y, 27, ... is a geometric sequence, then  $xy =$  \_\_\_\_\_
- (58) If  $f(x) = 12x + 15$ , then  $f(2) + f(5) + f(8) =$  \_\_\_\_\_
- (59) The two solutions of  $|x - c| = d$  are -12 and 18, the value of c is \_\_\_\_\_
- \*(60) The area of a square with diagonal 543 is \_\_\_\_\_
- (61) The geometric mean of 12 and 10 is  $a\sqrt{b}$ , where b has no perfect square divisor other than 1,  $a + b =$  \_\_\_\_\_
- (62)  $128 + 48 + 3 =$  \_\_\_\_\_ base 4
- (63)  $0.234234\dots =$  \_\_\_\_\_ (common fraction)
- (64) If  $f(3x + 2) = 12x + 7$ , then  $f(11) =$  \_\_\_\_\_
- (65) The  $x^2$  coefficient of  $(2x^2 + 9x + 3)(x^2 + 2x - 5)$  is \_\_\_\_\_
- (66)  $13^2 + 91^2 =$  \_\_\_\_\_
- (67)  $95 \times 55 =$  \_\_\_\_\_
- (68)  $(43_7)^2 =$  \_\_\_\_\_<sub>7</sub>
- (69) The area 30 - 60 - 90 right triangle with a hypotenuse of  $8\sqrt{3}$  is  $k\sqrt{3}$ ,  $k =$  \_\_\_\_\_
- \*(70) The volume of a rectangular prism with dimensions 23 by 35 by 45 is \_\_\_\_\_
- (71) P and Q are the roots of  $x^2 - 4x + 5 = 0$ .  $P^2 + 7PQ + Q^2 =$  \_\_\_\_\_
- (72) The axis of symmetry of  $f(x) = (x - a)(x - b)$  is  $x = 13$ ,  $a + b =$  \_\_\_\_\_
- (73) The number of distinct real roots of  $(2x - 5)(x^2 - 6x + 9) = 0$  is \_\_\_\_\_
- (74) If  $f(x)$  is a parabola with vertex (7, 5), then  $2f(x + 4) + 9$  has vertex (h, k).  $k =$  \_\_\_\_\_
- (75) How many distinct 7-letter arrangements can be made from {a,m,a,g,g,i,e}? \_\_\_\_\_
- (76) The sum of the integral solutions of  $|4x - 8| \leq 36$  is \_\_\_\_\_
- (77) How many real roots does  $f(x) = -3(x - 4)^2 - 7$  have? \_\_\_\_\_
- (78)  $\log 4 + \log 25 =$  \_\_\_\_\_
- (79)  $3\frac{1}{24} - \frac{3}{8} =$  \_\_\_\_\_ (improper fraction)
- \*(80)  $\sqrt[3]{2200} \times \sqrt{2200} =$  \_\_\_\_\_

## 2019-2020 TMSCA Middle School Number Sense Test 1 Key

- (1) 8092  
(2) 266  
(3) 35  
(4) 91  
(5) 2375  
(6)  $\frac{12}{25}$   
(7) 7  
(8) 160309  
(9) 12.25  
\*(10) 523887 – 579033  
(11) 3381  
(12)  $16\frac{3}{5}$   
(13) 2331  
(14) 288  
(15) 105  
(16) 12  
(17) 11  
(18) 2100  
(19) 11772  
\*(20) 401765 – 444055  
(21) 28  
(22) 630  
(23) 112
- (24)  $1\frac{2}{3}$   
(25) 2  
(26) 1.55  
(27) 92  
(28) 44238  
(29) 31  
\*(30) 99728 – 110224  
(31) 4  
(32) 6  
(33)  $132\frac{4}{25}$   
(34) 70.00  
(35) 32  
(36)  $2\frac{16}{117}$   
(37) 66  
(38) 10609  
(39) 44  
\*(40) 2741 – 3029  
(41) 440  
(42) 124  
(43) 1.353  
(44) 12  
(45) 510
- (46) 42  
(47)  $\frac{360}{11}$  or  $32\frac{8}{11}$   
(48) 7373  
(49) 25  
\*(50) 2387 – 2637  
(51) 84  
(52)  $10\frac{10}{17}$   
(53) 56.25  
(54) – 12  
(55)  $189\frac{1}{9}$   
(56) 3223  
(57) 81  
(58) 225  
(59) 3  
\*(60) 140054 – 154795  
(61) 32  
(62) 2303
- (63)  $\frac{26}{111}$   
(64) 43  
(65) 11  
(66) 8450  
(67) 5225  
(68) 2542  
(69) 24  
\*(70) 34414 – 38036  
(71) 41  
(72) 26  
(73) 2  
(74) 19  
(75) 1260  
(76) 38  
(77) 0  
(78) 2  
(79)  $\frac{8}{3}$  or  $2\frac{2}{3}$   
\*(80) 580 – 640