

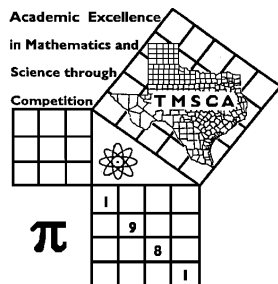
1st Score: _____	2nd Score: _____	3rd Score: _____	<b>Final Score</b>
Grader: _____	Grader: _____	Grader: _____	

PLACE LABEL BELOW

Name: \_\_\_\_\_ School: \_\_\_\_\_

SS/ID Number: \_\_\_\_\_ City: \_\_\_\_\_

Grade:    5    6    7    8                      Classification:    1A    2A    3A    4A    5A    6A



TMSCA MIDDLE SCHOOL  
 NUMBER SENSE  
 REGIONAL TEST ©  
 MARCH 4, 2017

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.

[illegible]

## 2016-2017 TMSCA Middle School Number Sense Regional Qualifier

- (1)  $324 + 978 =$  \_\_\_\_\_
- (2)  $14 + 23 + 32 + 41 + 50 =$  \_\_\_\_\_
- (3)  $13 \times 23 =$  \_\_\_\_\_
- (4)  $161208 \div 4 =$  \_\_\_\_\_
- (5)  $0.42 =$  \_\_\_\_\_ (fraction)
- (6)  $\frac{7}{11} - \frac{4}{7} =$  \_\_\_\_\_ (fraction)
- (7)  $8372 \div 9$  has a remainder of \_\_\_\_\_
- (8)  $8^2 \div (3^2 - 1) =$  \_\_\_\_\_
- (9)  $\frac{6}{11} \times 132 =$  \_\_\_\_\_
- \*(10)  $24783 - 2017 + 921 =$  \_\_\_\_\_
- (11)  $12 \times 14 =$  \_\_\_\_\_
- (12) 13 cups = \_\_\_\_\_ quarts
- (13)  $78 \times 38 =$  \_\_\_\_\_
- (14)  $96 \times 33\frac{1}{3} =$  \_\_\_\_\_
- (15)  $24^2 =$  \_\_\_\_\_
- (16)  $23\frac{1}{4}\% =$  \_\_\_\_\_ (fraction)
- (17)  $2600 = 26 \times 13 + 26 \times 53 + 26 \times$  \_\_\_\_\_
- (18) What is the largest number that divides 24, 40, and 72 without a remainder? \_\_\_\_\_
- (19)  $75^2 =$  \_\_\_\_\_
- \*(20)  $777 \times 449 =$  \_\_\_\_\_
- (21)  $12084 = 114 \times$  \_\_\_\_\_
- (22)  $0.454545... =$  \_\_\_\_\_ (fraction)
- (23)  $486 \times 111 =$  \_\_\_\_\_
- (24)  $16 \times 4\frac{9}{16} =$  \_\_\_\_\_
- (25) The sum of the smallest 20 positive even integers is \_\_\_\_\_
- (26) The largest prime divisor of 148 is \_\_\_\_\_
- (27) How many prime numbers are between 70 and 80? \_\_\_\_\_
- (28)  $(14^2 + 8^2) \div 4$  has a remainder of \_\_\_\_\_
- (29)  $13^2 + 39^2 =$  \_\_\_\_\_
- \*(30)  $47321 \div 159 =$  \_\_\_\_\_
- (31) How much does an \$80 item cost if there is a 30% off sale? \$ \_\_\_\_\_
- (32) 36 has how many positive integral divisors?
- (33)  $\frac{1+3+5+\dots+63}{1+3+5+7} =$  \_\_\_\_\_
- (34)  $25\frac{1}{3} \times 25\frac{2}{3} =$  \_\_\_\_\_ (mixed number)
- (35)  $36^2 - 24^2 =$  \_\_\_\_\_
- (36) The sum of the positive integral divisors of 26 is \_\_\_\_\_
- (37)  $16 \times \frac{2}{3} =$  \_\_\_\_\_ (mixed number)
- (38)  $74_8 =$  \_\_\_\_\_<sub>10</sub>
- (39) If  $f(x) = 4x^2 + 12x + 9$ , then  $f(9) =$  \_\_\_\_\_
- \*(40)  $\sqrt{7324710} =$  \_\_\_\_\_
- (41)  $\sqrt{7744} =$  \_\_\_\_\_
- (42) The median of a trapezoid with an area of 60 and a height of 8 is \_\_\_\_\_

- (43)  $94 \times 104 =$  \_\_\_\_\_
- (44) If  $1 + 2 + 3 + 4 + \dots + 63 = 21k$ , then  $k =$  \_\_\_\_\_
- (45) The product of  $\frac{9}{7}$  and its additive inverse is \_\_\_\_\_
- (46) If  $f(x) = \frac{17}{x^2}$ , then  $f\left(\frac{1}{2}\right) =$  \_\_\_\_\_
- (47) A regular polygon with an interior angle of  $160^\circ$  has \_\_\_\_\_ sides
- (48)  $47^2 + 66^2 =$  \_\_\_\_\_
- (49)  $13_8 + 44_8 + 62_8 =$  \_\_\_\_\_<sub>8</sub>
- \*(50)  $\sqrt{637}\sqrt{728} =$  \_\_\_\_\_
- (51)  $\frac{9}{14} + \frac{14}{9} =$  \_\_\_\_\_ (mixed number)
- (52)  $22 \times \frac{20}{17} =$  \_\_\_\_\_ (mixed number)
- (53) Find the sum of the solutions of  $|3x - 7| = 11$ . \_\_\_\_\_
- (54) The sum of the integral solutions of  $|x - 5| \leq 8$  is \_\_\_\_\_
- (55) The area of an equilateral triangle with side 18 is  $k\sqrt{3}$ ,  $k =$  \_\_\_\_\_
- (56) The geometric mean of 4, 6, and 9 is \_\_\_\_\_
- (57) 90% of 14 is 18% of \_\_\_\_\_
- (58) If  $f(x) = 13x - 4$ , then  $f(10) - f(3) =$  \_\_\_\_\_
- (59) How many distinct diagonals can be drawn inside a nonagon? \_\_\_\_\_
- \*(60) The volume of a  $19 \times 21 \times 49$  rectangular prism is \_\_\_\_\_
- (61)  $(33_6)^2 =$  \_\_\_\_\_<sub>6</sub>
- (62)  $0.1777\dots =$  \_\_\_\_\_ (fraction)
- (63) What is the 7<sup>th</sup> pentagonal number? \_\_\_\_\_
- (64)  $(32_7)^2 - (30_7)^2 =$  \_\_\_\_\_<sub>7</sub>
- (65) If  $23 \leq 4x - 1 \leq 59$ , then  $x$  has how many integer solutions? \_\_\_\_\_
- (66) The area of an isosceles right triangle with hypotenuse 22 is \_\_\_\_\_
- (67) Find the slope of a line perpendicular to  $3x - 0.5y = 7$  is \_\_\_\_\_
- (68)  $2x^2 + 7x - 15 = 0$  has roots P and Q, then  $PQ + P + Q =$  \_\_\_\_\_
- (69) The sum of the coefficients of  $(4x + 3y)^3$  is \_\_\_\_\_
- \*(70) 18 miles = \_\_\_\_\_ feet
- (71)  $406^2 =$  \_\_\_\_\_
- (72) If set  $A = \{t, m, s, c, a\}$  and set  $B = \{t, e, a, m, s\}$ , then  $A \cap B$  has \_\_\_\_\_ elements
- (73) The discriminant of  $-2x^2 + 3x + 4 = 0$  is \_\_\_\_\_
- (74) If  $\log_9 18 + \log_9 x = 2$ , then  $x =$  \_\_\_\_\_
- (75) If  $25^x = 144$ , then  $5^x =$  \_\_\_\_\_
- (76) What is the probability of obtaining a sum less than 5 when rolling two 6-sided die? \_\_\_\_\_
- (77)  $964 \times 101 =$  \_\_\_\_\_
- (78)  $27^{\frac{4}{3}} =$  \_\_\_\_\_
- (79) If  $f(x) = 3x^2 - 18x + 21$  and  $g(x) = f(x - 4)$ , then  $g(x)$  has an axis of symmetry of  $x =$  \_\_\_\_\_
- \*(80)  $1_7 + 2_7 + 3_7 + 4_7 + \dots + 100_7 =$  \_\_\_\_\_<sub>10</sub>

# 2016-2017 TMSCA Middle School Number Sense Regional Qualifier Key

(1) 1302	(23) 53946	(43) 9776	(62) $\frac{8}{45}$
(2) 160	(24) 73	(44) 96	(63) 70
(3) 299		(45) $-1\frac{32}{49}$ or $-\frac{81}{49}$	(64) 154
(4) 40302	(25) 420	(46) 68	(65) 10
(5) $\frac{21}{50}$	(26) 37	(47) 18	(66) 121
(6) $\frac{5}{77}$	(27) 3	(48) 6565	
(7) 2	(28) 0	(49) 141	(67) $-\frac{1}{6}$
(8) 8	(29) 1690	*(50) 647 – 715	
(9) 72	*(30) 283 – 312	(51) $2\frac{25}{126}$	(68) – 11
*(10) 22503 – 24871	(31) 56.00	(52) $25\frac{15}{17}$	(69) 343
(11) 168	(32) 9		*(70) 90288 – 99792
(12) 3.25, $3\frac{1}{4}$ or $\frac{13}{4}$	(33) 64	(53) $\frac{14}{3}$ or $4\frac{2}{3}$	(71) 164836
(13) 2964	(34) $650\frac{2}{9}$	(54) 85	(72) 4
(14) 3200	(35) 720		(73) 41
(15) 576	(36) 42	(55) 81	(74) $4\frac{1}{2}$ , 4.5, or $\frac{9}{2}$
(16) $\frac{93}{400}$	(37) $10\frac{2}{3}$	(56) 6	(75) 12
(17) 34	(38) 60	(57) 70	
(18) 8	(39) 441	(58) 91	(76) $\frac{1}{6}$
(19) 5625	*(40) 2572 – 2841		(77) 97364
*(20) 331430 – 366316	(41) 88	(59) 27	(78) 81
(21) 106		*(60) 18574 – 20528	(79) 7
(22) $\frac{5}{11}$	(42) 7.5, $7\frac{1}{2}$ or $\frac{15}{2}$	(61) 2013	*(80) 1164 – 1286