1st Score:	2nd Score:	3rd Score:	-			
Grader:	Grader:	Grader:Final So		Score		
PLACE LABEL BELOW						
Name:		School:				
SS/ID Number:		City:				
Grade: 5 6 7	8 Cla	ssification: 1A 2A	3A	4A	5A	6A

Academic Excellence in Mathematics and Science through Competition T M S C A							
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## TMSCA MIDDLE SCHOOL NUMBER SENSE TEST #13© FEBRUARY 25, 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 <u>non-black</u> 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 <u>FIVE</u> points. <u>FOUR</u> points will be deducted for all problems answered incorrectly or skipped before the last problem attempted.

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## 2016-2017 TMSCA Middle School Number Sense Test 13

- (1) 936 639 = \_\_\_\_\_
- (2)  $2017 \times 0.3 =$  (decimal)
- (3) 44×8=\_\_\_\_\_
- (4)  $4935 \div 7 =$
- (5) **0.76** = \_\_\_\_\_(fraction)
- (6) 244 ÷ 6 has a remainder of \_\_\_\_\_\_
- (8)  $12 \times 21 \div 7 4 =$
- (9)  $\frac{9}{4} \times \frac{8}{3} =$ \_\_\_\_\_
- \*(10) 2017 yards = \_\_\_\_\_feet
- (11) Which of the following is smaller,  $\frac{8}{13}$  or  $\frac{5}{8}$ ?
- (12) 84 × 86 =\_\_\_\_\_
- (13)  $66 \times 64 + 16 \times 66 =$
- $(14) \ \ 9 \div \frac{3}{7} = \underline{\hspace{1cm}}$
- (15) 28×28 =\_\_\_\_\_
- $(16) 12 \times 74 =$
- (17) 11×79 =\_\_\_\_\_
- **(18)** 1 + 2 + 3 + 4 + 5 + ... + 18 = \_\_\_\_\_\_
- (19) What is the greatest number that divides 15 and 55 with a remainder of 0?\_\_\_\_\_
- \*(20) 889 × 625 = \_\_\_\_\_
- (21) 0.8888... =\_\_\_\_\_(fraction)
- (22) 11340 = 108 ×\_\_\_\_\_

- $(23) 76 \times 36 =$
- (24) 18 has how many distinct prime divisors? \_\_\_\_\_
- (25) The additive inverse of 13 is\_\_\_\_\_
- (26) 1 + 3 + 5 + ... + 69 =
- (27) The square root of 676 is
- (28) 18% of 45 is \_\_\_\_\_(decimal)
- (29)  $(19+20+21+22+23) \div 10$  has a remainder of \_\_\_
- \*(30)  $\sqrt{48721} =$
- (31) The perimeter of a rectangle with area 45 and length 9 is\_\_\_\_\_
- $(32) 43_8 = \underline{\hspace{1cm}}_{10}$
- (33)  $4\frac{3}{8} \times 4\frac{5}{8} =$  (mixed number)
- $(34) 4^2 + 12^2 = \underline{\hspace{1cm}}$
- (35) 25 has how many positive integral divisors?\_\_\_\_\_
- (36) 9 gallons = \_\_\_\_\_quarts
- (37) The sum of the positive integral divisors of 18 is\_\_\_\_\_
- (38) 48 × 41 = \_\_\_\_
- (39) If x = 14, y = 9, and k is a positive integer, and  $x^2 + 4xy + 4y^2 = k^2$ , then k =\_\_\_\_
- \*(40) 68% of 6250 is \_\_\_\_\_
- (41) If  $\frac{4}{x-3} = \frac{2}{7}$ , then  $x = \underline{\phantom{a}}$
- (42) If 12 pairs of shoes cost \$540.00, then 4 pairs of shoes cost \$\_\_\_\_\_
- (43) The area of a trapezoid with bases 15 and 43 and a height of 30 is\_\_\_\_\_

- (44)  $\frac{9}{11} + \frac{11}{9} =$  (mixed number)
- (45) The perimeter of a regular octagon with sides 12.5 is \_\_\_\_\_
- (46) If  $f(x) = \sqrt{x^2 5^2}$ , then f(13) =
- $(47) 26^2 14^2 =$
- (48) The sum of the interior angles
  of a hexagon exceeds the sum
  of the interior angles of a triangle by\_\_\_\_\_\_°
- $(49) 513_8 = \underline{\hspace{1cm}}_2$
- \*(50) 35×17×403=\_\_\_\_
- (51)  $4\frac{2}{9} \times 14\frac{2}{9} =$  (mixed number)
- (52)  $24 \times \frac{27}{29} =$  (mixed number)
- (53) A set with 8 elements has how many subsets with 6 elements?\_\_\_\_\_
- (54) The area of an equilateral triangle is  $64\sqrt{3}$  has a side length of \_\_\_\_\_\_
- (55) The slope of a line with x-intercept (4,0) and passing through (7, 7) is\_\_\_\_\_\_
- (56) The arithmetic sequence 11, 23, 35, ..., 143 has \_\_\_\_\_\_ terms
- (57) If f(x) = 7x + 2, then f(20) f(10) =
- (58) 8<sup>12</sup> ÷ 16 has a remainder of\_\_\_\_\_
- (59)  $\sqrt{\frac{361}{25}} =$  \_\_\_\_\_(mixed number)
- \*(60) <sup>3</sup>√147 × 150 × 153 × 27 =\_\_\_\_\_
- (61) If  $x^4 = 81$ , then  $5x^2 =$
- $(62) \ 46^2 + 56^2 = \underline{\hspace{1cm}}$

- (63) The largest integer solution of 4x 7 < 38 is\_\_\_\_\_
- (64) 96 × 108 = \_\_\_\_\_
- (65)  $(5^2+10^2)+(5^2+15^2)+(5^2+35^2)=5^2\times$
- (67) The x-intercept and y-intercept of 4x + 5y = 100 are (p,0) and (0,q) respectively. p + q =
- (68) How many positive integers less than or equal to 30 are relatively prime to 30?\_\_\_\_\_
- (69) If  $\sqrt{3 \times 6 \times 9} = r\sqrt{s}$  and s has no perfect square divisors other than 1, then r + s =
- \*(70) The volume of a rectangular prism with length 39, width 41, and height 70 is\_\_\_\_\_
- (71) P and Q are roots of  $4x^2 47x + 36 = 0$ . The geometric mean of P and Q is\_\_\_\_\_
- (72) The sum of the 10<sup>th</sup> and 11<sup>th</sup> triangular numbers is\_\_\_\_\_
- (73) The sum of the integral solutions of  $|x-20| \le 7$  is\_\_\_\_\_
- (74) If  $4^{3x+2} = 2^{34}$ , then x =
- (76) The probability of choosing a one digit number that is a divisor of 12 is
- $(77) 1_9 + 2_9 + 3_9 + \dots + 10_9 + 11_9 = \underline{\hspace{1cm}}_9$
- (78) If  $\sqrt[4]{7x+4}-1=2$ , then x=\_\_\_\_\_\_
- (79) If  $937^2 = 877969$ , then  $950 \times 924 =$
- \*(80) 19 miles = \_\_\_\_\_feet

## 2016-2017 TMSCA Middle School Number Sense Key #13

(1) 297	(23) 2736	$(44) \ 2\frac{4}{99}$	(63) 11
(2) 605.1	(24) 2	,,,	(64) 10368
(3) 352	(25) – 13	(45) 100	(65) 65
(4) 705	(26) 1225	(46) 12	(66) 45
$(5) \frac{19}{25}$	(27) 26	(47) 480	(66) 15
(6) 4	(28) 8.1		(67) 45
$(7) \frac{16}{77}$	(29) 5	(48) 540	(68) 8
	*(30) 210 – 231	(49) 101001011	
(8) 32	(24) 20	*(50) 227796 – 251774	(69) 11
(9) 6	(31) 28	1	
*(10) 5749 – 6353	(32) 35	$(51) \ 60\frac{4}{81}$	*(70) 106334 – 117526
(11) $\frac{8}{13}$	$(33) \ \ 20\frac{15}{64}$	$(52) \ \ 22\frac{10}{29}$	(71) 3
(12) 7224	(34) 160		
	(35) 3	(53) 28	(72) 121
(13) 5280	(36) 36	(EA) 16	(52) 200
(14) 21	, ,	(54) 16	(73) 300
(15) 784	(37) 39	(55) $\frac{7}{3}$ or $2\frac{1}{3}$	(74) 5
(16) 888	(38) 1968	$(33) \frac{1}{3} \text{ of } 2\frac{1}{3}$	
(17) 869	(39) 32	(56) 12	<b>(75)</b> – <b>1</b>
(18) 171	*(40) 4038 – 4462	(57) 70	
(19) 5	(41) 17	(58) 0	(76) $\frac{1}{2}$ or .5
*(20) 527844 – 583406	(42) 180 00	$(59) \ 3\frac{4}{5}$	(77) 61
(21) $\frac{8}{9}$	(42) 180.00	3	(78) 11
	(42) 970	*(60) 428 – 472	` '
(22) 105	(43) 870	(61) 45	(79) 877800

(62) 5252

\*(80) 95,304 – 105,336