


## TMSCA MIDDLE SCHOOL NUMBER SENSE

TEST \# 4 ©
NOVEMBER11, 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.

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(1) $2018-1234=$
(2) $35 \times 12=$ $\qquad$
(3) $14+20+26-15=$
(4) $48 \times 25=$ $\qquad$
(5) $11 \times 94=$
(6) $4^{3}=$
(7) $483742 \div 3$ has a remainder of
(8) Find the sum of the smallest 4 prime numbers.
(9) $\frac{3}{5}=$ $\qquad$ \%
*(10) $2018 \times 248=$
(11) $41 \times 49=$
(12) $93 \div 2=$ $\qquad$ (mixed number)
(13) $93 \times 95=$ $\qquad$
(14) $\mathbf{2}$ feet $+\mathbf{9}$ inches $=$ $\qquad$ inches
(15) $18^{2}=$ $\qquad$
(16) $42 \times 37=$
(17) $67 \times 111=$ $\qquad$
(18) $83 \times 35-48 \times 35=$ $\qquad$
(19) $\frac{9}{13}-\frac{4}{7}=$ $\qquad$ (fraction)
*(20) $334 \times 839=$ $\qquad$
(21) $12 \times 33 \frac{1}{3}=$ $\qquad$
(22) The arithmetic mean of 15,24 , and $\qquad$ is 25
(23) $97 \times 17=$ $\qquad$
(24) $2018 \div 9=$ $\qquad$ (mixed number)
(25) $1+3+5+\ldots+37=$
(26) $23^{2}-17^{2}=$
(27) How many integers between

50 and 100 are the square of an integer? $\qquad$
(28) What is the LCM of 44 and 99 ? $\qquad$
(29) $102 \times 114=$ $\qquad$
*(30) $\mathbf{4 3 2 8 1} \div 143=$ $\qquad$
(31) $\frac{10!}{8!}=$
(32) 62 has how many positive integral divisors?
(33) $25^{2}+75^{2}=$
(34) $\frac{9}{11}+\frac{11}{9}=$ $\qquad$ (mixed number)
(35) By how much does the sum of the smallest

16 positive odd integers exceed the sum of the smallest 9 positive odd integers? $\qquad$
(36) How many fractions with a numerator of 2 are between $\frac{1}{3}$ and $\frac{1}{5}$ ?
(37) Find the hypotenuse of a
right triangle which has legs of 9 and 12 .
(38) $\mathbf{5 6 2 5}=\mathbf{7 3} \times 77+$ $\qquad$
(39) If $3(2 x-5)=40$, then $9(5-2 x)=$ $\qquad$
*(40) $\sqrt{381459}=$
(41) The area of a square with diagonal $3 \sqrt{6}$ is $\qquad$
(42) $\sqrt{8649}=$ $\qquad$
(43) $123_{8}=$ $\qquad$
(44) The exterior angle of an equilateral triangle has a measure of $\qquad$ $\circ$
(45) $92^{2}+11^{2}=$ $\qquad$
(46) The product of 1.7 and its additive inverse is $\qquad$
(47) The set $\{\mathbf{a}, \mathrm{g}, \mathrm{h}, \mathrm{i}, \mathrm{k}, \mathrm{m}, \mathrm{n}, \mathrm{o}\}$ has how many subsets have with either 2 or 6 elements? $\qquad$
(48) $48 \times 34=$ $\qquad$
(49) If $\mathbf{4}+8+\mathbf{1 2}+\ldots+56=4 k$, then $k=$ $\qquad$
*(50) Find the $50^{\text {th }}$ pentagonal number. $\qquad$
(51) $27 \times \frac{26}{23}=$ $\qquad$ (mixed number)
(52) How many terms are in the arithmetic sequence $5,11,17, \ldots, 89$ ? $\qquad$
(53) $5 \times 6 \times 7 \times 8+1=k^{2}$ and $k>0$, then $k=$ $\qquad$
(54) Find the slope of a line perpendicular to the line which contains the points $(4,3)$ and $(8,9)$. $\qquad$
(55) $7 \frac{3}{4} \times 5 \frac{3}{4}=$ $\qquad$ (mixed number)
(56) The $7^{\text {th }}$ triangular number is $\qquad$
(57) $\frac{3}{4}$ of a mile $=$ $\qquad$ yards
(58) The remainder when the sum of the digits of $3^{16}$ is divided by 9 is $\qquad$
(59) $17.5^{2}-16.5^{2}+15.5^{2}-14.5^{2}=$ $\qquad$
*(60) $92 \times 95 \times 96=$ $\qquad$
(61) $147_{8}=$ $\qquad$ $-2$
(62) The sum of the solutions of $|x-2.75|=4$ is $\qquad$
(63) The longest leg of a $30-60-90$ right triangle with a hypotenuse of $14 \sqrt{3}$ is $\qquad$
(64) If $f(x)=12 x+19$, then $f(108)-f(7)=$ $\qquad$
(65) How many integer solutions does $7 \leq 2 x \leq 39$ have? $\qquad$
(66) The $y$-intercept of $y-4=2(x-3)$ is $\qquad$
(67) $\left(35_{8}\right)^{2}=$ $\qquad$
(68) If $p, q$, and $r$, are roots of $x^{3}-4 x^{2}-15 x+12=0$, then $p+q+r+p q r=$ $\qquad$
(69) The set $\{\mathbf{a}, \mathrm{g}, \mathrm{h}, \mathrm{i}, \mathrm{k}, \mathrm{m}, \mathrm{n}, \mathrm{o}\}$
has how many subsets? $\qquad$
*(70) $22^{2} \times 18^{2}=$ $\qquad$
(71) $f(x)=3 x^{2}-2 x+5$ has $\qquad$ real roots
(72) The geometric mean
of $5^{9}, 5^{10}, 5^{11}$ and $5^{14}$ is $5^{x}$, where $\mathrm{x}=$ $\qquad$
(73) If $f(x)$ is a parabola with vertex $(2,5)$, then $\mathbf{Q f}(\mathrm{x}-4)+7$ has vertex $(6,22) . Q=$ $\qquad$
(74) $704^{2}=$ $\qquad$
(75) $\sqrt{\frac{9!2!}{7!}}=$ $\qquad$
(76) Find the probability of choosing a divisor of $\mathbf{1 2}$ from the smallest $\mathbf{1 2}$ natural numbers. $\qquad$
(77) How many positive integers less than 26 are relatively prime to 26? $\qquad$
(78) If a line with an $x$-intercept of -4 has a slope of 2 , then it has a $\mathbf{y}$-intercept of $\qquad$
(79) If $x-3=11$, then $x^{2}-8 x+16=$ $\qquad$
*(80) $\mathbf{6 0 \%}$ of $132 \times 300=$ $\qquad$

## 2017-2018 TMSCA Middle School Number Sense Key \#4

(1) 784
(2) 420
(3) 45
(4) 1200
(5) 1034
(6) 64
(7) 1
(8) 17
(9) 60
*(10) 475441 - 525487
(11) 2009
(12) $46 \frac{1}{2}$
(13) 8835
(14) 33
(15) 324
(16) 1554
(17) 7437
(18) 1225
(19) $\frac{11}{91}$
*(20) 266215-294237
(21) 400
(22) 36
(23) 1649
(24) $224 \frac{2}{9}$
(25) 361
(26) 240
(27) 2
(28) 396
(29) 11628
*(30) $288-317$
(31) 90
(32) 4
(33) 6250
(34) $2 \frac{4}{99}$
(35) 175
(36) 3
(37) 15
(38) 4
(39) -120
*(40) $587-648$
(41) 27
(42) 93
(43) 83
(44) 120
(45) 8585
(46) $-2.89,-2 \frac{89}{100},-\frac{289}{100}$
(47) 56
(48) 1632
(49) 105
*(50) 3539-3911
(51) $30 \frac{12}{23}$
(52) 15
(53) 41
(54) $-\frac{2}{3}$
(55) $44 \frac{9}{16}$
(56) 28
(57) 1320
(58) 0
(59) 64
*(60) 797088-880992
(61) 1100111
(62) $5.5,5 \frac{1}{2}, \frac{11}{2}$
(68) -8
(69) 256
*(70) 148976-164656
(71) 0
(63) 21
(64) 1212
(65) 16
(66) -2
(67) 1511
(72) 11
(73) 3
(74) 495616
(75) 12
(76) $\frac{1}{2}$
(77) 12
(78) 8
(79) 100
*(80) 22572-24948

