1st Score: _____	2nd Score: _____	3rd Score: _____	**Final Score**
Grader: _____	Grader: _____	Grader: _____	

Name:_____ School:_____

SS/ID Number:_____ City:_____

Grade: 9 10 11 12 Classification: 1A 2A 3A 4A 5A 6A

TMSCA HIGH SCHOOL
NUMBER SENSE
TEST #3 ©
NOVEMBER 2, 2019

GENERAL DIRECTIONS

1. Write only the requested information on this cover sheet. 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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2019-2020 TMSCA High School Number Sense Test 3

(1) $1679 - 455 - 224 =$ _____

(2) $3.6 \times 7.5 + 2.7 =$ _____

(3) $4000 \div 9 =$ _____ **(mixed number)**

(4) $\frac{3}{5} - 2 + \frac{4}{5}$ _____**(fraction)**

(5) $\frac{5}{16} =$ _____ **% (decimal)**

(6) $11{,}111 = 1234 \times k + 5.$ $k^2 =$ _____

(7) $18 + 22 + 26 + 30 + 34 =$ _____

(8) $374 \times 11 =$ _____

(9) $5.77 \times 10^2 - 88 =$ _____

***(10)** $357 + 1433 + 3211 - 1823 =$ _____

(11) DCCLXXVII = _____ **(Arabic number)**

(12) 10 is _____ **% of 60?**

(13) The sum of the proper factors of 36 is _____

(14) $64 \div 2\frac{2}{7} =$ _____

(15) If 5 bips cost \$6.25, then 12 bips cost \$_____

(16) $14 \times 256 =$ _____

(17) $8\frac{2}{3} + 4\frac{7}{9} =$ _____ **(mixed number)**

(18) The number of prime numbers less than 80 and greater than 65 is _____

(19) $33^2 =$ _____

***(20)** $651 \times 148 \div 3 =$ _____

(21) $53 \times 57 + 4 =$ _____

(22) 245 base 6 is _____**base 10**

(23) $\left(3\frac{1}{4}\right)^3 =$ _____ **(improper fraction)**

(24) $5\frac{2}{5} \times 15\frac{4}{5} =$ _____ **(mixed number)**

(25) $36^2 - 64^2 =$ _____

(26) $\frac{40}{\left(5^3\right)\left(2^2\right)} =$ _____ **(decimal)**

(27) $0.0888... =$ _____ **(fraction)**

(28) $56^2 =$ _____

(29) $38^2 + 19^2 =$ _____

***(30)** $\left(\sqrt{580} - \sqrt{170}\right)^3 =$ _____

(31) The simple interest on \$800 for 2 years was \$72. The annual rate was _____ %

(32) $(4x + 3)(4x - 3) = ax^2 + bx + c.$ $a + b + c =$ __

(33) $4^{-1} + 4^{-2} + 4^{-3} =$ _____

(34) An icosahedron has _____ faces

(35) $68_9 =$ _____$_3$

(36) The smallest root of $|2x - 5| = 17$ **is** _____

(37) 60% of 60 minus 50 = _____

(38) The units digit of $(43)^{31}$ **is** _____

(39) $A = \{1, 4, 5, 9, 14, 23, 37, m, n...\}.$ $n =$ _____

***(40)** $\sqrt{337792} =$ _____

(41) $\left(414_6\right)\left(5_6\right) =$ _____$_6$

(42) $373 \times 1111 =$ _____

(43) $17 + 23 + 29 + 35 + ... + 77 =$ _____

(44) $2x + y = 6$ and $3x - y = 14$. $xy =$ _____

(45) The coefficient of the x^4y term in the expansion of $(3x - 2y)^5$ is _____

(46) $621_7 - 244_7 =$ _____$_7$

(47) $97 \times 105 =$ _____

(48) $7! \div 5! + 4! =$ _____

(49) $45 \times 54 =$ _____

***(50)** $452,696 \times .777 =$ _____

(51) The vertex of $y = x^2 - 6x + 4$ is (h, k). $k =$ _____

(52) $2^3 - 12^3 - 280 =$ _____

(53) $1 + 3 + 6 + 10 + ... + 91 + 105 =$ _____

(54) Find the sum of the fourth triangular number and the fourth pentagonal number_____

(55) $(89)^2 - (55)(144) =$ _____

(56) The odds of losing is 45%. The probability of winning is _____

(57) $330° = k\pi$ radians. $k =$ _____

(58) $16 + 12 + 9 + 6.25 + 5.0625 + ... =$ _____

(59) $12 \times \frac{15}{17} - 11 =$ _____

***(60)** $479 \times 523 =$ _____

(61) $70° C =$ _____$° F$

(62) $\sin B = .8$, B is in QII. $\cos B =$ _____

(63) How many ways can 4 people be seated in a row of 5 chairs?_____

(64) 0.3666... base 8 = _____ base 8 fraction

(65) $36^2 - 33^2 + 30^2 - 27^2 =$ _____

(66) Find the distance from $(6, -1)$ to the line $5x + 12y = 5$. _____

(67) The sum of the product of the roots taken 2 at a time of $x^3 + 3x^2 - 10x - 24 = 0$ is___

(68) $\cos A = \frac{\sqrt{3}}{2}$. $\tan^2 A =$ _____

(69) $996 \times 991 =$ _____

***(70)** $2708 \times \frac{39}{10} \div \frac{9}{16} =$ _____

(71) The slope of the line tangent to $y = 2x^3 + 4x$ at $(-2, -24)$ is _____

(72) $f(x) = \frac{4x + 3}{5} - 6$. $f^{-1}(1) =$ _____

(73) $\lim_{x \to 0} \left(\frac{1 - \cos(x)}{x} \right) =$ _____

(74) $f(x) = (2x + 1)^4$. $f'(-1) =$ _____

(75) $\begin{vmatrix} 4 & 6 \\ -2 & 5 \end{vmatrix} = 8x$. $x =$ _____

(76) The first 4 digits of the decimal for $\frac{32}{44}$ base 5 is 0._____ base 5

(77) $121 \times 101 =$ _____

(78) $f'(x) = 4x + 1$, $f(0) = 3$. $f(1) =$ _____

(79) $g(x) = \sqrt{x - 1}$. $g(g(290)) =$ _____

***(80)** $\sqrt[3]{3,503,056} =$ _____

2019-2020 TMSCA HSNS Test 3 Key

(1) 1000

(2) 29.7

(3) $444\frac{4}{9}$

(4) $-\frac{3}{5}$

(5) 31.25

(6) 81

(7) 130

(8) 4114

(9) 489

***(10)** 3020 – 3336

(11) 777

(12) $16\frac{2}{3}$ or $\frac{50}{3}$

(13) 55

(14) 28

(15) 15.00

(16) 3584

(17) $13\frac{4}{9}$

(18) 4

(19) 1089

***(20)** 30511 – 33721

(21) 3025

(22) 101

(23) $\frac{2197}{64}$

(24) $85\frac{8}{25}$

(25) –2800

(26) .08

(27) $\frac{4}{45}$

(28) 3136

(29) 1805

***(30)** 1280 – 1414

(31) $4\frac{1}{2}$, 4.5, $\frac{9}{2}$

(32) 7

(33) $\frac{21}{64}$, .328125

(34) 20

(35) 2022

(36) –6

(37) –14

(38) 7

(39) 97

***(40)** 553 – 610

(41) 3322

(42) 414403

(43) 517

(44) –8

(45) –810

(46) 344

(47) 10185

(48) 66

(49) 2430

***(50)** 334158 – 369332

(51) –5

(52) –2000

(53) 560

(54) 32

(55) 1

(56) $\frac{20}{29}$

(57) $\frac{11}{6}$ or $1\frac{5}{6}$

(58) 64

(59) $-\frac{7}{17}$

***(60)** 237992 – 263042

(61) 158

(62) –.6 or $-\frac{3}{5}$

(63) 120

(64) $\frac{33}{70}$

(65) 378

(66) 1

(67) –10

(68) $\frac{1}{3}$

(69) 987036

***(70)** 17837 – 19714

(71) 28

(72) 8

(73) 0

(74) –8

(75) 4

(76) 3232

(77) 12221

(78) 6

(79) 4

***(80)** 145 – 159