PLACE LABEL BELOW

Name: _____ School: _____

SS/ID Number: _____ City: _____

Grade: 4   5   6   7   8   Classification: 1A   2A   3A   4A   5A   6A
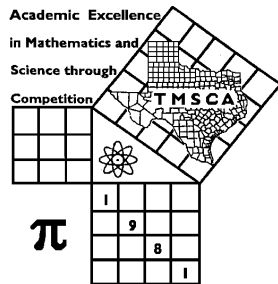
T M S C A   M I D D L E   S C H O O L

N U M B E R   S E N S E

T E S T   # 4 ©

N O V E M B E R   9 ,   2 0 1 9

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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2019-2020 TMSCA Middle School Number Sense Test #4

(1) $243 - 185 =$ _____

(2) $23 \times 14 =$ _____

(3) $6488 \div 8 =$ _____

(4) $92 \times 75 =$ _____

(5) $54 \times 12 =$ _____

(6) $28357 \div 7$ has a remainder of_____

(7) $224 \times 6 =$ _____

(8) $9^3 =$ _____

(9) $\frac{2}{3} =$ _____%(mixed number)

*(10) $2734 - 836 - 999 =$ _____

(11) $3009 = 51 \times$ _____

(12) $84^2 =$ _____

(13) $9.3 =$ _____(improper fraction)

(14) $37 \times 936 = 111 \times$ _____

(15) The mean of the smallest 6 prime numbers is_____

(16) $3\frac{1}{2} \times 54 =$ _____

(17) $\frac{1 + 2 + 3 + \ldots + 24}{1 + 2 + 3 + \ldots + 12} =$ _____

(18) $115^2 =$ _____

(19) $88 \times 37\frac{1}{2} =$ _____

*(20) $635 \times 332 =$ _____

(21) $94 \times 9.2 =$ _____(decimal)

(22) $47 \times 53 =$ _____

(23) $70 \times 7.3 =$ _____

(24) $15 \times 3\frac{7}{15} =$ _____

(25) $119 + 117 + 115 + \ldots + 1 =$ _____

(26) What is the smallest two digit number that has a remainder of 5 when divided by 14 and 21? _____

(27) The reciprocal of 3.1 is _____(fraction)

(28) The largest prime divisor of 777 is_____

(29) $6! \div 8$ has a remainder of _____

*(30) 20 miles =_____ feet

(31) 111 has how many positive integral divisors?_____

(32) $\left(\frac{5}{8}\right)^3 =$ _____ (fraction)

(33) $13\frac{7}{13} \times 13\frac{6}{13} =$ _____(mixed number)

(34) If $4x + 3 = 35$, then $12x =$ _____

(35) $\left(7^2 + 42 \div 6\right) \div 4$ has a remainder of _____

(36) $\frac{13}{17} + \frac{17}{13} =$ _____(mixed number)

(37) $10\frac{3}{5} \times 9\frac{2}{5} =$ _____ (mixed number)

(38) A trapezoid with bases of 17 and x has a median of 12, $x =$ _____

(39) How many fractions between $\frac{1}{3}$ and 3 have a denominator of 12 with an integer numerator?__

*(40) $\sqrt{318245} =$ _____

(41) If 45% of 72 = A% of 15, then $A =$ _____

(42) The largest root of $|3x - 1| = 17$ is _____

(43) $\sqrt{15376} =$ _____

(44) $16 \times 18 + 6 \times 18 =$ _____

(45) $1 + 3 + 5 + \ldots + 83 = k^2$, $k > 0$. $k =$ _____

(46) $1^3 + 2^3 + 3^3 + 4^3 + 5^3 =$ _____

(47) The exterior angle of a
regular 45-sided polygon is _____°

(48) If $f(x) = 3x^2 - 8x + 13$, then $f(6) =$ _____

(49) If $f(x) = \sqrt{3x + 13}$, and $f(a) = 11$, then $a =$ _____

*(50) $\sqrt[3]{100000} =$ _____

(51) The area of a circle
with radius 10.2 is $k\pi$, $k =$ _____

(52) $\frac{28}{23} \times 28 =$ _____(mixed number)

(53) $0.848484\ldots =$ _____(common fraction)

(54) Find the slope of the perpendicular bisector
of the line containing $A(4, 2)$ and $B(9, -2)$. _____

(55) $1 + 1 + 2 + 3 + 5 + 8 + 13 + 21 =$ _____

(56) $43_5 + 334_5 =$ _____$_5$

(57) The geometric mean of 45 and 10
is $a\sqrt{b}$, where b has no perfect
square divisors greater than 1, $a =$ _____

(58) If $f(x) = 43x$, then $f(17) + f(19) + f(21) =$ _____

(59) The shorter leg of a right triangle
with hypotenuse 65 and longer leg 63 is _____

*(60) $97^3 =$ _____

(61) The coefficient of the x^4 term
of $(x + 1)(x + 2)(x + 3)(x + 4)(x + 5)$ is_____

(62) $3^8 \times 9^5 \times 81^k = 3^{50}$, $k =$ _____

(63) If $6^{x + 2} = 28\frac{4}{5}$, then $6^x =$ _____

(64) The first 4 digits in the
expansion of $\frac{23}{90}$ is $0.$_____

(65) If the roots of $x^2 + bx + c = 0$
are $3 - 7i$ and $3 + 7i$, then $c =$ _____

(66) An 83-sided
polygon has_____distinct diagonals

(67) A trapezoid with bases of 10 and 18 and
a height of 12 has its height change to 23,
what is the corresponding change in area?_____

(68) How many triangles can be drawn
from a given vertex of a 20-sided polygon? _____

(69) If $\frac{a}{b} + \frac{b}{a} = 2\frac{16}{77}$ and a and b are relatively
prime, then the greater of a and b is_____

*(70) $65^3 =$ _____

(71) $1 + 2 + 4 + 8 + \ldots + 2^9 =$ _____

(72) $32^2 + 224^2 =$ _____

(73) $904^2 =$ _____

(74) If $f(x)$ is a parabola with vertex $(11, 5)$,
then $2f(x - 3) + k$ has vertex $(14, 31)$. $k =$ _____

(75) $12^8 \div 7$ has a remainder of_____

(76) $f(x) = 2x^3 - 7x^2 + 2x + 8$. $f(6) =$ _____

(77) $12^{\frac{1}{2}} \times 48^{\frac{1}{2}} =$ _____

(78) $f(x) = x^3 + bx^2 + cx + d$ has roots
P, Q and R. The geometric
mean of P, Q, and R is 6. $d =$ _____

(79) $53_8 =$ _____$_2$

*(80) $3.14^6 =$ _____

2019-2020 TMSCA Middle School Number Sense Test 4 Key

(1) 58

(2) 322

(3) 811

(4) 6900

(5) 648

(6) 0

(7) 1344

(8) 729

(9) $66\frac{2}{3}$

*(10) 855 – 943

(11) 59

(12) 7056

(13) $\frac{93}{10}$

(14) 312

(15) $\frac{41}{6}$ or $6\frac{5}{6}$

(16) 189

(17) $\frac{50}{13}$ or $3\frac{11}{13}$

(18) 13225

(19) 3300

*(20) 200279 – 221361

(21) 864.8

(22) 2491

(23) 511

(24) 52

(25) 3600

(26) 47

(27) $\frac{10}{31}$

(28) 37

(29) 0

*(30) 100320 – 110880

(31) 4

(32) $\frac{125}{512}$

(33) $182\frac{42}{169}$

(34) 96

(35) 0

(36) $2\frac{16}{221}$

(37) $99\frac{16}{25}$

(38) 7

(39) 31

*(40) 536 – 592

(41) 216

(42) 6

(43) 124

(44) 396

(45) 42

(46) 225

(47) 8

(48) 73

(49) 36

*(50) 45 – 48

(51) 104.04, $104\frac{1}{25}$, $\frac{2601}{25}$

(52) $34\frac{2}{23}$

(53) $\frac{28}{33}$

(54) $\frac{5}{4}$, $1\frac{1}{4}$, or 1.25

(55) 54

(56) 432

(57) 15

(58) 2451

(59) 16

*(60) 867040 – 958306

(61) 15

(62) 8

(63) $\frac{4}{5}$ or .8

(64) 2555

(65) 58

(66) 3320

(67) 154

(68) 171

(69) 11

*(70) 260894 – 288356

(71) 1023

(72) 51200

(73) 817216

(74) 21

(75) 4

(76) 200

(77) 24

(78) – 216

(79) 101011

*(80) 911 – 1006