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

PLACE LABEL BELOW

Name:_____School:_____

SS/ID Number:_____City:_____

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

Academic Excellence in Mathematics and Science through Competition

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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 # 1 ©
O C T O B E R   1 7 ,   2 0 2 0

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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(1) $456 + 229 =$ _____

(2) $593 - 345 =$ _____

(3) $\dfrac{3}{10} + \dfrac{3}{5} =$ _____ (fraction)

(4) $68\% =$ _____ (fraction)

(5) $28 \times 25 =$ _____

(6) $17^2 =$ _____

(7) $69 \div 9 =$ _____ (mixed number)

(8) $49 - (3 + 1) + 15 =$ _____

(9) $\dfrac{3}{8} =$ _____ % (decimal)

*(10) $433 + 338 + 692 =$ _____

(11) $6\dfrac{1}{3} - 2\dfrac{5}{6} =$ _____ (mixed number)

(12) $96 \times 93 =$ _____

(13) $72 \div 0.24 =$ _____

(14) $56 \times 54 =$ _____

(15) 60% of 70 less 22 is _____

(16) Which is larger, $\dfrac{6}{11}$ or $\dfrac{7}{13}$? _____

(17) $14 + 20 + 26 + 32 + 38 =$ _____

(18) $85 \times 65 =$ _____

(19) The mean of $16, 26, 22,$ and 24 is _____

*(20) $348 \times 198 =$ _____

(21) $5! + 4! + 3! = \;=$ _____

(22) $103 \times 107 =$ _____

(23) 30% of 42 is 90% of _____

(24) $0.363636... =$ _____ (fraction)

(25) 432 base 5 =_____ base 10

(26) The largest prime divisor of 91 is _____

(27) $\dfrac{5}{6} + \dfrac{5}{12} + \dfrac{5}{24} =$ _____ (mixed number)

(28) What is 7% tax on $30.00? $_____

(29) $\dfrac{9}{7} + \dfrac{7}{9} =$ _____ (mixed number)

*(30) $\sqrt{287355} =$ _____

(31) If 9 bots cost $18.45, then 6 bots cost $_____

(32) $47 \times 111 =$ _____

(33) $53^2 - 47^2 =$ _____

(34) $98 \times 104 =$ _____

(35) 1 gallon = _____ cubic inches

(36) If the area of a square is 324,
then the perimeter is _____

(37) The number of the positive
integral divisors of 30 is _____

(38) If $7x - 6 = 15,$ then $x^4 =$ _____

(39) How many integers between
22 and 68 are divisible by 6? _____

*(40) 36 yards = _____ inches

(41) $100°\,C =$ _____ °F

(42) $(9x + 2)^2 = ax^2 + bx + c.$ $a + b + c =$ _____

(43) $P = \{5, 3, 8, 11, 19, 30, m, n\}.$ $n =$ _____

(44) The larger root of $(5x - 1)^2 = \dfrac{9}{25}$ is _____

(45) $357_8 + 321_8 =$ _____ $_8$

(46) $444 \times \dfrac{5}{37} =$ _____

(47) $123456 \div 11$ has a remainder of _____

(48) The 12th triangular number is _____

(49) The total surface area of a cube with edge = 8 cm is _____ cm²

*(50) $22 \times 26 \times 30 =$ _____

(51) $804^2 =$ _____

(52) How many positive integers less than or equal to 52 are relatively prime to 52? _____

(53) $\dfrac{7}{12} - \dfrac{22}{35} =$ _____ (fraction)

(54) The slope of a line containing the points $(3, -3)$ and $(-3, 9)$ is _____

(55) $2323_4 =$ _____ $_2$

(56) $13 \times \dfrac{17}{19} =$ _____ (mixed number)

(57) $998 \times 993 =$ _____

(58) $(25 + 35 \times 11) \div 6$ has a remainder of _____

(59) If the midpoint of the line segment with endpoints $(7, 9)$ and $(2, 1)$ is (a, b), then $a + b =$ _____

*(60) $\sqrt[3]{30000} =$ _____

(61) $425_7 \div 5_7 =$ _____ $_7$

(62) $f(x) = x^2 - 8x + 16.$ $f(25) =$ _____

(63) If the roots of $2x^2 - 9x + 10 = 0$ are P and Q, then $PQ + (P + Q) =$ _____

(64) $12 + 9 + \dfrac{27}{4} + \dfrac{81}{16} + \dfrac{243}{64} + ... =$ _____

(65) The probability of rolling two dice and getting a sum of 7 or 8 is _____

(66) If $20^8 \div 10 = \left(2^x\right)\left(5^y\right)$, then $x + y =$ _____

(67) If $(14)^x = 8$, then $(14)^{(x+1)} =$ _____

(68) If the vertex of the parabola $y = x^2 - 6x + 4$ is (h, k), then $k =$ _____

(69) The first 4 digits of the decimal for $\dfrac{22}{45}$ are 0._____

*(70) $e^3 \times \pi^3 =$ _____

(71) If $x^2 + y^2 = 90,$ $x > y > 0,$ and both x and y are integers then $x + y =$ _____

(72) $\left(234_6\right) \times \left(5_6\right) =$ _____ $_6$

(73) The sum of the integral solutions of $|4x + 8| \leq 40$ is _____

(74) The probability of flipping a coin 5 times and obtaining exactly 5 heads is _____

(75) $5 + 6 + 11 + 17 + 28 + ... + 191 + 309 =$ _____

(76) $1^3 + 2^3 + 3^3 + 4^3 + 5^3 =$ _____

(77) If $f(x) = \dfrac{3x - 7}{4} - 12$, then $f^{-1}(8) =$ _____

(78) If $(3)(7)(37)(k) = 30303$, then $k =$ _____

(79) $21^3 - 20^3 =$ _____

*(80) $14 \times 28 \times 42 \times 56 =$ _____

2020-2021 TMSCA MSNS Test 1 Key

(1) 685

(2) 248

(3) $\dfrac{9}{10}$

(4) $\dfrac{17}{25}$

(5) 700

(6) 289

(7) $7\dfrac{2}{3}$

(8) 60

(9) 37.5

*(10) 1390 − 1536

(11) $3\dfrac{1}{2}$

(12) 8928

(13) 300

(14) 3024

(15) 20

(16) $\dfrac{6}{11}$

(17) 130

(18) 5525

(19) 22

*(20) 65459 − 72349

(21) 150

(22) 11021

(23) 14

(24) $\dfrac{4}{11}$

(25) 117

(26) 13

(27) $1\dfrac{11}{24}$

(28) 2.10

(29) $2\dfrac{4}{63}$

*(30) 510 − 562

(31) 12.30

(32) 5217

(33) 600

(34) 10192

(35) 231

(36) 72

(37) 8

(38) 81

(39) 8

*(40) 1232 − 1360

(41) 212

(42) 121

(43) 79

(44) $\dfrac{8}{25}$

(45) 700

(46) 60

(47) 3

(48) 78

(49) 384

*(50) 16302 − 18018

(51) 646416

(52) 24

(53) $-\dfrac{19}{420}$

(54) −2

(55) 10111011

(56) $11\dfrac{12}{19}$

(57) 991014

(58) 2

(59) $\dfrac{19}{2}, 9\dfrac{1}{2}, 9.5$

*(60) 30 − 32

(61) 61

(62) 441

(63) $\dfrac{19}{2}, 9\dfrac{1}{2}, 9.5$

(64) 48

(65) $\dfrac{11}{36}$

(66) 22

(67) 112

(68) −5

(69) 4888

*(70) 592 − 653

(71) 12

(72) 2102

(73) −42

(74) $\dfrac{1}{32}$

(75) 803

(76) 225

(77) 29

(78) 39

(79) 1261

*(80) 875885 - 968083

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