8

1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
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

T M S C A M I D D L E S C H O O L

C A L C U L A T O R

T E S T # 1 1 ©

F E B R U A R Y 2 0, 2 0 2 1

GENERAL DIRECTIONS

I. About this test:
  A. You will be given 30 minutes to take this test. There are 80 problems on this test.
  B. ALL calculators must be cleared. HP Prime and Casio Prizm calculators are NOT permitted.
II. How to write the answers:
  A. For all problems except stated problem as noted below write three significant digits.
    1. Examples (* means correct, but not recommended)
      Correct: 12.3, 123, 123.*, 1.23x10*, $1.23x10^{0}$*, $1.23x10^{1}$, $1.23x10^{01}$, .0190, $1.90x10^{-2}$
      Incorrect: 12.30, 123.0, $1.23(10)^{2}$, $1.23\cdot10^{2}$, $1.230x10^{2}$, $1.23*10^{2}$, 0.19, $1.9x10^{-2}$, $19.0x10^{-3}$, 1.90E-02
    2. Plus or minus one digit error in the third significant digit is permitted.
  B. For stated problems:
    1. Except for integer, dollar sign, and significant digit problems, as detailed below, answers to stated problems should be written with three significant digits.
    2. Integer problems are indicated by (integer) in the answer blank. Integer problems answers must be exact, no plus or minus one digit, no decimal point or scientific notation.
    3. Dollar sign ($) problems should be answered to the exact cent, but plus or minus one cent error is permitted. The decimal point and cents are required for exact dollar answers.
III. Some symbols used on the test.
  A. Angle measure: rad means radians; deg means degrees.
  B. Inverse trigonometric functions: arcsin for inverse sine, etc.
  C. Special numbers: π for 3.14159 . . . ; e for 2.71828.
  D. Logarithms: Log means common (base 10); Ln means natural (base e).
IV. Scoring:
  A. 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.

2020-2021 TMSCA Middle School Calculator Test #11A

1. 5410 – 5170 ---------- 1=_____

2. 7.3 + 2.5 + 4 ---------- 2=_____

3. 1550 – 566 + 2360 ---------- 3=_____

4. 43 + 29 – π – 33 ---------- 4=_____

5. 820 + 673 + 308 + 1020 ---------- 5=_____

6. –72 + 212 – 119 – 115 – 277 ---------- 6=_____

7. (2.74 + 2.49 – 5.27) – (4.63 + 4.73) ---------- 7=_____

8. –1.24 + 0.987 + 0.538 + 0.792 + 2.5 ---------- 8=_____

9. 57.3 x 142 x 509 ---------- 9=_____

10. 269 x 136 x 507 x 52.6 ---------- 10=_____

11. Calculate the range of the following list of numbers. pi squared, the negative square root of twenty-seven, e to the fifth power, four-fifteenths, the cubed root of negative seventy-nine, and two. ---------- 11=_____

12. Convert 273 cubic feet to cubic centimeters. ---------- 12=_____cm^3

13. Calculate the area of a 45-45-90 right triangle with a hypotenuse that measures 22.8 feet. ---------- 13=_____$ft.^2$

14. $(592)[565 \times 430 \times 661]$ ---------- 14=_____

15. $(69/59)[70 - 123]$ ---------- 15=_____

16. $\{233/296\}\left[\frac{330}{69 + 420}\right]$ ---------- 16=_____

17. $(141 + 253)[208 - 95 - 315]$ ---------- 17=_____

18. $\frac{(62/185) + (103/100)}{(0.115 - 0.0195)}$ ---------- 18=_____

19. $\left[\frac{(1010/1030) - (710/262)}{0.0194/(0.0167)}\right]$ ---------- 19=_____

20. $\frac{0.767 + 2.52 + 1.93}{(\pi)(28.6)(0.255)}$ ---------- 20=_____

21. $\frac{(2.16)(8.48)}{341}(0.00206 - 0.00298)$ ---------- 21=_____

22. $\frac{(\pi)(23/134)(114/136)}{(138/134)}$ ---------- 22=_____

23. $\left[\frac{958 + 2240}{728 - 606}\right]\left[\frac{1780}{648}\right]$ ---------- 23=_____

24. What percent of one million is pi? ---------- 24=_____%

25. The total cost of an item plus 6.25% tax is $387.98. Calculate the cost of the item without the tax. ---------- 25=$_____

26. The ratio of coupes to sedans to pickups is 12 to 7 to 25. There are a total of 854 sedans, calculate the total number of vehicles. 26=_____INT.

27. $[2260 - (2130 + 432)] + [(-0.0854)(3100 - 465)]$ ------ 27=_____

28. $\dfrac{(0.015 + 0.00445)(0.0458 + 0.05)}{(2.21\text{x}10^{11})}$ ---------- 28=_____

29. $\dfrac{(0.0111 - 0.0413)(0.0824 + 0.111)}{(2.49\text{x}10^{11})}$ ---------- 29=_____

30. $\dfrac{1}{-0.502} + \dfrac{1}{(\pi)(0.586 - 0.832)}$ ---------- 30=_____

31. $(21.2)\left[(1.68\text{x}10^{-13}) - (1.35\text{x}10^{-13})\right]$ ---------- 31=_____

32. $\dfrac{(0.00752 + 0.00822)}{(2.63\text{x}10^{12})}$ ---------- 32=_____

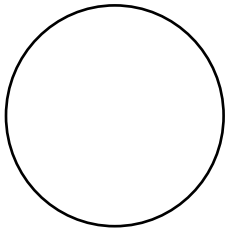
33. $1/(0.0255 - 0.179) - 1/(-0.0873)$ ---------- 33=_____

34. $\left[\dfrac{1/119}{1/103}\right] + [0.486]$ ---------- 34=_____

35. If the sum of a number and ten is multiplied by five, the result is two greater than seven times the opposite of the number. Calculate the value of the number. ---------- 35=_____INT.

36. A line passes through the points (2,5) and (-4,-3). If the equation of the line is put into the form y = mx + b, calculate the value of b. ---------- 36=_____

CIRCLE

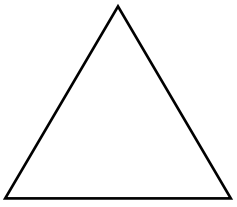


Area = 8954

Circumference = ?

37=_____

EQUILATERAL TRIANGLE



Height = 0.00349

Side = ?

38=_____

39. $\left[\dfrac{16400 + (1/(6.48\text{x}10^{-5}))}{(3140/23000) - 0.1}\right]^2$ ---------- 39=_____

40. $\left[\dfrac{78.9}{1.78}\right](0.38 + 1.55)^2$ ---------- 40=_____

41. $(0.0558 + 0.0675 + 0.25)^2(1.05 + 1.41)^2$ ---------- 41=_____

42. $(1/(0.00911))(1110 - 813)^2$ ---------- 42=_____

43. $\sqrt{5310} + \sqrt{3240 + 2590} - (\pi)\sqrt{685}$ ---------- 43=_____

44. $\sqrt{(1190/1300) + 0.403 - 0.272}$ ---------- 44=_____

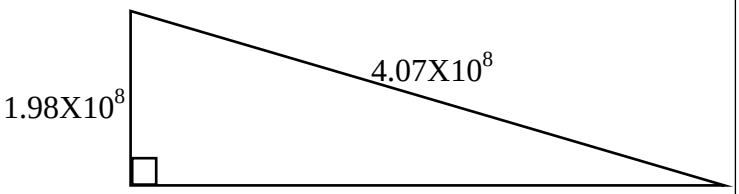
45. $\dfrac{1}{\sqrt{97.9 + 685 + 411}} + \left(\dfrac{1}{\sqrt{4.4}}\right)^2$ ---------- 45=_____

46. $\dfrac{(29.2 + 26.1)^{1/2}}{(66500 - 62000)^{1/5}}$ ---------- 46=_____

47. Calculate the distance between the y-intercept and the x-intercept of the line y = -5x + 8. ---------- 47=_____

48. The circumference of a circle and the perimeter of a square are the same. The square has an area of 245 cm^2. Calculate the area of the circle. ---------- 48=_____cm

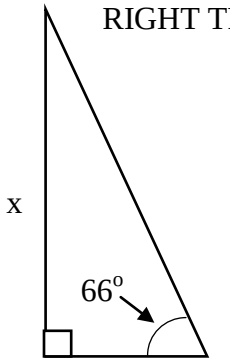
RIGHT TRIANGLE



Area = ?

49=_____

RIGHT TRIANGLE



0.0404 x = ?

50=_____

51. $\dfrac{\sqrt{2.02 + \pi + 0.799}}{(210 - 339 + 92.2)^3}$ ---------- 51=_____

52. $\dfrac{(66300 + 27900 - 38200)^2}{\sqrt{2.93\text{x}10^5 + 81700 + 1.92\text{x}10^5}}$ ---------- 52=_____

53. $\left[\dfrac{2260 - 1350 + \sqrt{2.81\text{x}10^7/37.2}}{-21.7 + 179}\right]^4$ ---------- 53=_____

54. $\sqrt{\dfrac{1/(13.2 - 7.4)}{(39.8)(68.8 + 34.9)^2}}$ ---------- 54=_____

55. $58900 + \sqrt{(38300)(16000)} - (42000 + 8860)$ ---------- 55=_____

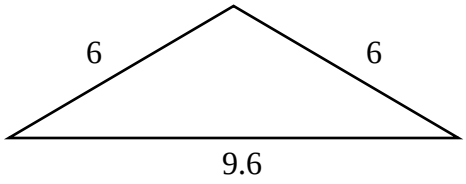
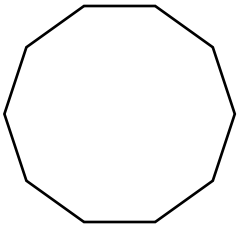
56. $\sqrt{\dfrac{(10100)(12800)}{(1890)(5110)}} - 3.34 + 2.07$ ---------- 56=_____

57. $\sqrt{\dfrac{(6580)(45.1)}{(701) + (1260)}} + 1/(0.285)^2$ ---------- 57=_____

58. $\sqrt{\dfrac{(5850)(639)}{(20) + (54.3)}} - 256$ ---------- 58=_____

59. Ronald invested a total of $20,000 into two separate accounts, one paying 9% simple interest and the other paying 4% simple interest. At the end of one year, he made a total of $1200.00 in interest. Calculate the amount he invested at the higher rate. -- 59=$_____

60. Circle A has a radius of 2.89 inches and Circle B has a radius of 12.6 inches. Calculate the ratio of the area of Circle A to the circumference of Circle B. ---------- 60=_____

ISOSCELES TRIANGLE	REGULAR DECAGON
 Area = ?	 Perimeter = 88.2 Area = ?
61=_____	62=_____

63. $\frac{20! - 18!}{13!}$ ---------- 63=_____

64. $(477 - \pi)e^{0.937}$ ---------- 64=_____

65. (deg) $(7.25 + 1.43)\tan(258°)$ ---------- 65=_____

66. (deg) $\tan(69.9° - 11°) + 1.59$ ---------- 66=_____

67. (rad) $\frac{\sin(21.8)}{294/101}$ ---------- 67=_____

68. (rad) $(36800)\sin(72)$ ---------- 68=_____

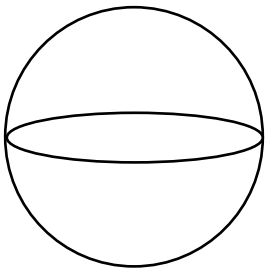
69. (deg) $\frac{\sin(2.07°) - \tan(2.07°)}{\sin(2.07°)}$ ---------- 69=_____

70. $(84.6 - 560)e^{\pi - 0.266}$ ---------- 70=_____

71. An urn contains 12 blue marbles and 5 pink marbles. A marble is drawn and dropped back into the urn. A second marble is drawn and then dropped back into the urn. Both marbles are blue. If another marble is drawn calculate the probability that it will be blue. ---------- 71=_____

72. The inner diagonal of a cube is 951 cm. Calculate the length of an edge of the cube in cm. ---------- 72=_____cm

SPHERE

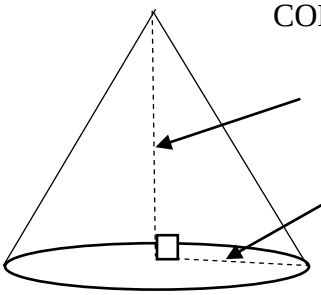


Volume = 62652

Surface Area = ?

73=_____

CONE



Lateral Surface Area = ?

74=_____

75. $\frac{\text{Log}(1.67\text{x}10^{9} + 1.95\text{x}10^{9})}{6.25}$ ---------- 75=_____

76. $\frac{\text{Log}(3720 + 987)}{14.3 - 24}$ ---------- 76=_____

77. $(60400)10^{(0.112)(5.73)}$ ---------- 77=_____

78. $(1.19)^{\pi}(0.276)^{4}(62.8 - 21.6)^{4}$ ---------- 78=_____

79. $4 + 6 + 8 + \ldots + 664$ ---------- 79=_____

80. $-\frac{1}{(9.1)} + \frac{1}{3(9.1)^{3}} - \frac{1}{5(9.1)^{5}} + \frac{1}{7(9.1)^{7}}$ ---------- 80=_____

2020-2021 TMSCA Middle School Calculator Test #11A Answer Key

Page 1

1 = 240
= 2.40×10^{2}

2 = 13.8
= 1.38×10^{1}

3 = 3340
= 3.34×10^{3}

4 = 35.9
= 3.59×10^{1}

5 = 2820
= 2.82×10^{3}

6 = -371
= -3.71×10^{2}

7 = -9.40
= -9.40×10^{0}

8 = 3.58
= 3.58×10^{0}

9 = 4.14×10^{6}

10 = 9.76×10^{8}

11 = 153
= 1.53×10^{2}

12 = 7.73×10^{6}

13 = 130
= 1.30×10^{2}

Page 2

14 = 9.51×10^{10}

15 = -62.0
= -6.20×10^{1}

16 = 0.531
= 5.31×10^{-1}

17 = -79600
= -7.96×10^{4}

18 = 14.3
= 1.43×10^{1}

19 = -1.49
= -1.49×10^{0}

20 = 0.228
= 2.28×10^{-1}

21 = -4.94×10^{-5}

22 = 0.439
= 4.39×10^{-1}

23 = 72.0
= 7.20×10^{1}

24 = 0.000314
= 3.14×10^{-4}

25 = $365.16

26 = 5368 INT.

Page 3

27 = -527
= -5.27×10^{2}

28 = 8.43×10^{-15}

29 = -2.35×10^{-14}

30 = -3.29
= -3.29×10^{0}

31 = 7.00×10^{-13}

32 = 5.98×10^{-15}

33 = 4.94
= 4.94×10^{0}

34 = 1.35
= 1.35×10^{0}

35 = -4 INT.

36 = 2.33
= 2.33×10^{0}

37 = 335
= 3.35×10^{2}

38 = 0.00403
= 4.03×10^{-3}

Page 4

39 = 7.60×10^{11}

40 = 165
= 1.65×10^{2}

41 = 0.843
= 8.43×10^{-1}

42 = 9.68×10^{6}

43 = 67.0
= 6.70×10^{1}

44 = 1.02
= 1.02×10^{0}

45 = 0.256
= 2.56×10^{-1}

46 = 1.38
= 1.38×10^{0}

47 = 8.16
= 8.16×10^{0}

48 = 312
= 3.12×10^{2}

49 = 3.52×10^{16}

50 = 0.0907
= 9.07×10^{-2}

2020-2021 TMSCA Middle School Calculator Test 11A Answer Key

Page 5

51 = -4.90×10^{-5}

52 = 4.17×10^{6}

53 = 16400
= 1.64×10^{4}

54 = 0.000635
= 6.35×10^{-4}

55 = 32800
= 3.28×10^{4}

56 = 2.39
= 2.39×10^{0}

57 = 24.6
= 2.46×10^{1}

58 = -31.7
= -3.17×10^{1}

59 = $8,000.00

60 = 0.331
= 3.31×10^{-1}

Page 6

61 = 17.3
= 1.73×10^{1}

62 = 599
= 5.99×10^{2}

63 = 3.90×10^{8}

64 = 1210
= 1.21×10^{3}

65 = 40.8
= 4.08×10^{1}

66 = 3.25
= 3.25×10^{0}

67 = 0.0653
= 6.53×10^{-2}

68 = 9340
= 9.34×10^{3}

69 = -0.000653
= -6.53×10^{-4}

70 = -8430
= -8.43×10^{3}

71 = 0.706
= 7.06×10^{-1}

72 = 549
= 5.49×10^{2}

Page 7

73 = 7630
= 7.63×10^{3}

74 = 62.3
= 6.23×10^{1}

75 = 1.53
= 1.53×10^{0}

76 = -0.379
= -3.79×10^{-1}

77 = 265000
= 2.65×10^{5}

78 = 28900
= 2.89×10^{4}

79 = 111000
= 1.11×10^{5}

80 = -0.109
= -1.09×10^{-1}

TMSCA 20-21 MS CA Test #11A Solutions to Word and Geometry Problems

11. $e^5 - \left(-\sqrt{27}\right)$

12.

$$273\ ft^3 \cdot \frac{12^3 in^3}{1 ft^3} \cdot \frac{2.54^3 cm^3}{1 in^3}$$

The HP has a conversion key so on it: 273(1728) and use the key to convert to cm (three times).

13. $\frac{(22.8)^2}{4}$

24. $\frac{x}{100} = \frac{\pi}{1{,}000{,}000}$

$$x = \frac{100\pi}{1{,}000{,}000}$$

25. $1.0625x = 387.98$

$$x = \frac{387.98}{1.0625}$$

26. $12x + 7x + 25x = 44x =$ total vehicles.

$7x = 854$ sedans so $x = 122.$

$$44x = 44(122)$$

35. $5(n + 10) = -7n + 2$

$$12n = -48; n = \frac{-48}{12}$$

36. $m = \frac{5+3}{2+4} = \frac{4}{3}$

Using $y = mx + b$,

$5 = \frac{4}{3}(2) + b;\ \ b = 5 - \frac{8}{3}$

37. $\pi r^2 = 8954; r = \sqrt{\frac{8954}{\pi}}$

C = $2\pi r = 2\pi\left(\sqrt{\frac{8954}{\pi}}\right)$

38. $\left(\frac{.00349}{\sqrt{3}}\right)(2)$

47. y-intercept is (0,-8)

x-intercept is $\left(-\frac{8}{5}, 0\right)$

distance = $\sqrt{(-8)^2 + \left(-\frac{8}{5}\right)^2}$

48. Perimeter of square =

$$4\left(\sqrt{245}\right)$$

Circumference =

$$4\left(\sqrt{245}\right) = 2\pi r$$

$$r = \frac{4\sqrt{245}}{2\pi}$$

Area of circle =

$$\pi r^2 = \pi\left(\frac{4\sqrt{245}}{2\pi}\right)^2$$

49. Long leg =

$\sqrt{(4.07\ x\ 10^8)^2 - (1.98\ x\ 10^8)^2}$

Area =

$$\frac{(long\ leg)(1.98\ x\ 10^8)}{2}$$

50. $\frac{tan\ 66}{1} = \frac{x}{.0404}$

$$x = .0404(\tan 66)$$

59. $\left\{\begin{matrix} x + y = 20000 \\ .09x + .04y = 1200 \end{matrix}\right\}$

$\left\{\begin{matrix} -4x - 4y = -80000 \\ 9x + 4y = 120000 \end{matrix}\right\}$

$5x = 40000; x = 8000.00$

60. $\frac{(2.89)^2\pi}{2\pi(12.6)} = \frac{(2.89)^2}{2(12.6)}$

61. 10.8 = semi-perimeter

Area =

$\sqrt{10.8(10.8-6)(10.8-9.6)(10.8-6)}$

62. $\frac{(88.2)^2}{tan\left(\frac{180}{10}\right)(4\ x\ 10)}$

71. $\frac{12}{17}$

72. $\frac{951}{\sqrt{3}}$

73. $\frac{4}{3}\pi r^3 = 62652$

$$r = \sqrt[3]{\frac{62652(3)}{4\pi}}$$

SA = $4\pi r^2 = 4\pi\left(\sqrt[3]{\frac{62652(3)}{4\pi}}\right)^2$

74. Slant height = s

$$\sqrt{(5.22)^2 + (3.23)^2}$$

Lateral Surface area = πrs =

$\pi(3.23)\left(\sqrt{(5.22)^2 + (3.23)^2}\right)$