8

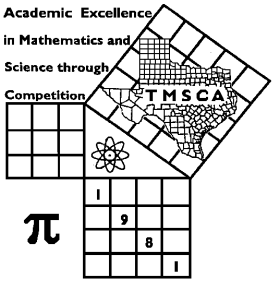
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

PLACE LABEL BELOW

Name:_____ School:_____

SS/ID Number:_____ City:_____

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



TMSCA MIDDLE SCHOOL CALCULATOR TEST#5©

NOVEMBER 14, 2020

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 #5

1. 8200 – 946 ---------- 1=_____

2. 25 + 22 – 30 ---------- 2=_____

3. 91 + 126 – 125 ---------- 3=_____

4. 47 – 28 + 11 – π ---------- 4=_____

5. 6190 + 5110 – 4050 – 1020 ---------- 5=_____

6. –160 + 39 – 175 – 93.1 + 32.9 ---------- 6=_____

7. (–1.19 – 0.653) + (1.92 – 1.4 – 1.26) ---------- 7=_____

8. –2.88 + 1.9 – 3.31 + 0.759 + 1.32 ---------- 8=_____

9. 71.7 x 140 x 111 ---------- 9=_____

10. 148 x 100 x 5240 x 153 ---------- 10=_____

11. The mean weight of five 5^{th}-graders is 78 pounds. The weight of the first four 5^{th}-graders are 59 pounds, 85 pounds, 110 pounds and 72 pounds. Calculate the weight of the fifth 5^{th}-grader. ----- 11=_____lbs.

12. A shipping container has a weight of 2,575 kilograms. Calculate the number of tons this container weighs. ---------- 12=_____tons

13. The circumference of a circle is 562 cm. Calculate the area of the circle. ---------- 13=_____cm^2

14. $(448)[51 \times 466 \times 145]$ ---------- 14=_____

15. $(-387)[327 \times 401/71]$ ---------- 15=_____

16. $(111 + 93)[27 - 65 - 122]$ ---------- 16=_____

17. $\left[\frac{761}{589}\right][(201/615) + 0.202]$ ---------- 17=_____

18. $\frac{[0.734/(0.548)]/64.6}{(0.368 \times 1.65)(0.0118)}$ ---------- 18=_____

19. $\left[\frac{(6550/5840) - (2120/1280)}{0.00226/(0.0055)}\right]$ ---------- 19=_____

20. $\frac{38}{(98 - 101)} - \frac{(71 - 123)}{151}$ ---------- 20=_____

21. $(0.0321)[391/220 \times 576/723] - 0.0134$ ---------- 21=_____

22. $\frac{(0.108 + 0.0498 - 0.0589)}{\{(0.643 - 0.62)/(2530)\}}$ ---------- 22=_____

23. $\left[\frac{805 + 758}{772 - 892}\right]\left[\frac{1490}{1160}\right]$ ---------- 23=_____

24. The DISD school population is now 1723 and expects an increase of 3% every fall. Calculate the expected school population in five years. Round to the nearest whole person.---------- 24=_____INT.

25. The perimeter of a square is 259 in. Calculate the length of the diagonal of the square in inches. ---------- 25=_____in.

26. The ratio of cats to dogs at the Bark & Purr Inn is 1:3. If there are 76 cats and dogs at the Inn, calculate the number of cats. ------ 26=_____INT.

27. $\dfrac{(11.7 + 25.9)(0.0139 + 0.0318)}{(1.02\text{x}10^{11})}$ ---------- 27=_____

28. $(121)[(0.384/0.605)(12 + 12.5)]$ ---------- 28=_____

29. $\dfrac{(2.59\text{x}10^{12}) + (4.74\text{x}10^{12})}{(-6.78)(1.99) - 5.61}$ ---------- 29=_____

30. $\dfrac{1}{151} + \dfrac{1}{(\pi)(497 - 435)}$ ---------- 30=_____

31. $[0.0313]\left[\dfrac{1/0.00348}{1/(0.00323)}\right]$ ---------- 31=_____

32. $\dfrac{1}{-2.6} + \dfrac{1}{(0.264 - 1.25)}$ ---------- 32=_____

33. $\left[\dfrac{1/422}{1/470}\right] + [0.809]$ ---------- 33=_____

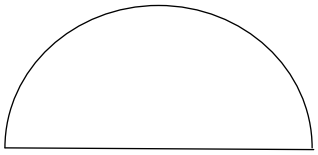
34. $\dfrac{1}{206} - \dfrac{1}{(56.3 + 118)}$ ---------- 34=_____

35. GameNGo had a BOGO sale on video games, buy one at regular price get half off the second of equal or lesser value. Todd buys games that cost $52.85 and $64.99. Calculate how much these games would cost during the sale not including tax. ------- 35=$_____

36. Calculate the value of 3435 Base 6 in Base 10. ---------- 36=_____INT.

37.

SEMICIRCLE



Perimeter = 137.8

Radius = ?

37=_____

38.

RECTANGLE

0.0067

Area = $2.21\text{x}10^{-5}$

Width = ?

38=_____

39. $\dfrac{(12600 + 27900)^2}{(0.107 - 0.246)^3}$ ---------- 39=_____

40. $(96.7 + 191)^2(0.497 + 0.784)^2$ ---------- 40=_____

41. $\sqrt{\dfrac{4.64 + 1.77}{419 - 229}}$ ---------- 41=_____

42. $(1/\pi)\sqrt{\dfrac{0.0524 + 0.0187}{2.05 - 1.86}}$ ---------- 42=_____

43. $\sqrt{(165/152) + 0.614 - 0.422}$ ---------- 43=_____

44. $(1/(0.0182))(1.43x10^5 - 1.32x10^5)^2$ ---------- 44=_____

45. $\left[\sqrt{(1640/1200)(1.17)}\right]^4$ ---------- 45=_____

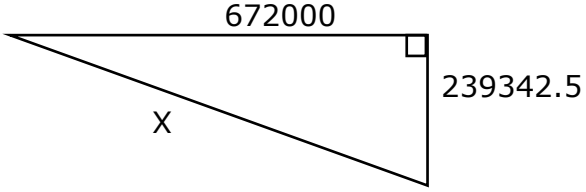
46. $(669)\sqrt[3]{559 + 535 - 176}$ ---------- 46=_____

47. The diagonal of a square is 15.8 cm. If this length is increased by 30%, calculate the percent increase in the area. ---------- 47=_____%

48. A nanosecond is one billionth of a second. Calculate the number nanoseconds in a week. ---------- 48=_____ns

49.

RIGHT TRIANGLE

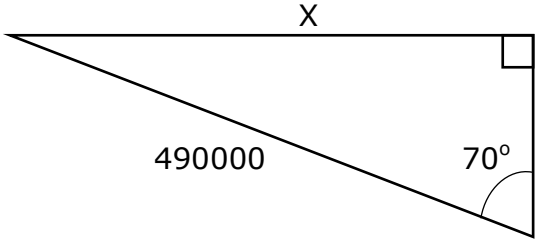


X = ?

49=_____

50.

RIGHT TRIANGLE



X = ?

50=_____

51. $\left[\frac{13.7 - 6.57 + \sqrt{12300/463}}{-512 + 2030}\right]^{-3}$ ---------- 51=_____

52. $\sqrt{\frac{1.07\text{x}10^{-5}}{(3460)(0.0109)}} + \frac{(1.37 - 10.9)}{(3980 + 8760)}$ ---------- 52=_____

53. $\frac{\sqrt{13.4 + \pi + 11.9}}{(0.129 - 0.114 + 0.168)^3}$ ---------- 53=_____

54. $10300 + \sqrt{(1880)(3130)} - (5340 + 14400)$ ---------- 54=_____

55. $(209)^2 \sqrt{(75.1)/(0.248)} - (4.31\text{x}10^5 + 7.58\text{x}10^5)$ -------- 55=_____

56. $\sqrt{\frac{(86600)(1.79\text{x}10^5)}{(3.02\text{x}10^5)(57600)}} - 0.643 + 0.166$ ---------- 56=_____

57. (deg) $\tan(56.8^\circ) + (221/164)$ ---------- 57=_____

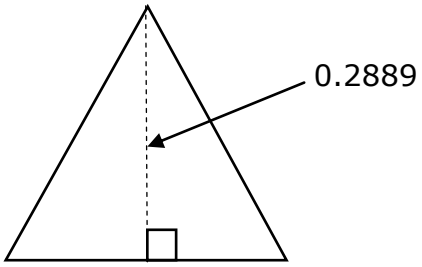
58. (rad) $\tan(217) + (246/211)$ ---------- 58=_____

59. Three numbers are in the ratio of 3:5:12 with a sum of 10,887. Calculate the value of the largest number. ---------- 59=_____

60. Calculate the amount of money at 8% simple interest earns the same yearly interest as $5000 at 3.25% simple interest. -------- 60=$_____

61.

EQUILATERAL TRIANGLE

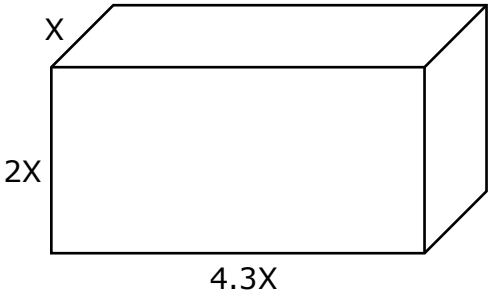


Area = ?

61=_____

62.

RECTANGULAR PRISM



Surface Area = 650

X = ?

62=_____

63. $\frac{23! - 21!}{6!}$ ---------- 63=_____

64. (deg) $\frac{\cos(5.04°)}{3700}$ ---------- 64=_____

65. $(1.12\text{x}10^{5} - 2.24\text{x}10^{5})^{6}(2.42\text{x}10^{9})$ ---------- 65=_____

66. (rad) $\cos\left[\frac{(9.85)(\pi)}{(58)(28.8)}\right]$ ---------- 66=_____

67. (deg) $(746 - 483)\cos(23.4°) + 26.1$ ---------- 67=_____

68. (deg) $\frac{\sin(58.4°)}{\tan(58.4°)}[1.8]$ ---------- 68=_____

69. (rad) $(723)\tan(164)$ ---------- 69=_____

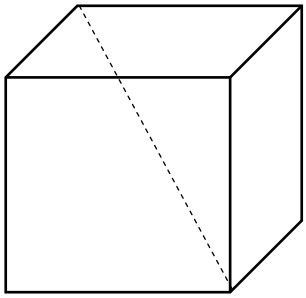
70. $(1030 - 373 + 498)^{5/3}$ ---------- 70=_____

71. The side of an equilateral triangle and the diameter of a circle are equal, measuring 24.6 cm. Calculate what percentage of the area of the circle is the area of the triangle. ---------- 71=_____%

72. A combination dial lock has fifty numbers on it. If the combination has three numbers to it, calculate how many different combinations the lock could have. Repetition is allowed. ---------- 72=_____

73.

CUBE



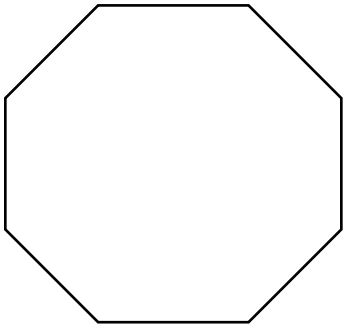
Inner Diagonal = 32.1

Surface Area = ?

73=_____

74.

REGULAR OCTAGON



Area = 20702

Side = ?

74=_____

75. $\frac{\text{Log}(1.23\text{x}10^{10} + 5.52\text{x}10^{9})}{0.511}$ ---------- 75=_____

76. $\frac{(1.44)^{0.84}(34.1)^{0.428}}{(6.19 - 3.17)^{-10}}$ ---------- 76=_____

77. $\frac{1250 - 2680}{\text{Log}(939 + 479)}$ ---------- 77=_____

78. $\text{Ln}\left[\frac{1.35 + 6.77 + 4.38}{9.37 - 3.18 - 4.61}\right]$ ---------- 78=_____

79. $2 + 4 + 6 + \ldots + 668$ ---------- 79=_____

80. $-\frac{1}{(6.8)} + \frac{1}{3(6.8)^3} - \frac{1}{5(6.8)^5} + \frac{1}{7(6.8)^7}$ ---------- 80=_____

2020 – 2021 TMSCA Middle School Calculator Test 5 Answer Key

Page 1

1 = 7250
= 7.25×10^{3}

2 = 17.0
= 1.70×10^{1}

3 = 92.0
= 9.20×10^{1}

4 = 26.9
= 2.69×10^{1}

5 = 6230
= 6.23×10^{3}

6 = -356
= -3.56×10^{2}

7 = -2.58
= -2.58×10^{0}

8 = -2.21
= -2.21×10^{0}

9 = 1.11×10^{6}

10 = 1.19×10^{10}

11 = 64.0
= 6.40×10^{1}

12 = 2.84
= 2.84×10^{0}

13 = 25100
= 2.51×10^{4}

Page 2

14 = 1.54×10^{9}

15 = -715000
= -7.15×10^{5}

16 = -32600
= -3.26×10^{4}

17 = 0.683
= 6.83×10^{-1}

18 = 2.89
= 2.89×10^{0}

19 = -1.30
= -1.30×10^{0}

20 = -12.3
= -1.23×10^{1}

21 = 0.0321
= 3.21×10^{-2}

22 = 10900
= 1.09×10^{4}

23 = -16.7
= -1.67×10^{1}

24 = 1997 INT.

25 = 91.6
= 9.16×10^{1}

26 = 19 INT.

Page 3

27 = 1.68×10^{-11}

28 = 1880
= 1.88×10^{3}

29 = -3.84×10^{11}

30 = 0.0118
= 1.18×10^{-2}

31 = 0.0291
= 2.91×10^{-2}

32 = -1.40
= -1.40×10^{0}

33 = 1.92
= 1.92×10^{0}

34 = -0.000883
= -8.83×10^{-4}

35 = $91.42

36 = 815 INT.

37 = 26.8
= 2.68×10^{1}

38 = 0.00330
= 3.30×10^{-3}

Page 4

39 = -6.11×10^{11}

40 = 136000
= 1.36×10^{5}

41 = 0.184
= 1.84×10^{-1}

42 = 0.195
= 1.95×10^{-1}

43 = 1.13
= 1.13×10^{0}

44 = 6.65×10^{9}

45 = 2.56
= 2.56×10^{0}

46 = 6500
= 6.50×10^{3}

47 = 69.0
= 6.90×10^{1}

48 = 6.05×10^{14}

49 = 713000
= 7.13×10^{5}

50 = 460000
= 4.60×10^{5}

2020 – 2021 TMSCA Middle School Calculator Test 5 Answer Key

Page 5

51 = 1.89×10^{6}

52 = -0.000215
= -2.15×10^{-4}

53 = 870
= 8.70×10^{2}

54 = -7010
= -7.01×10^{3}

55 = -429000
= -4.29×10^{5}

56 = 0.467
= 4.67×10^{-1}

57 = 2.88
= 2.88×10^{0}

58 = 1.40
= 1.40×10^{0}

59 = 6530
= 6.53×10^{3}

60 = $2,031.25

Page 6

61 = 0.0482
= 4.82×10^{-2}

62 = 4.67
= 4.67×10^{0}

63 = 3.58×10^{19}

64 = 0.000269
= 2.69×10^{-4}

65 = 4.78×10^{39}

66 = 1.00
= 1.00×10^{0}

67 = 267
= 2.67×10^{2}

68 = 0.943
= 9.43×10^{-1}

69 = 535
= 5.35×10^{2}

70 = 127000
= 1.27×10^{5}

71 = 55.1
= 5.51×10^{1}

72 = 125000
= 1.25×10^{5}

page 7 .

73 = 2060
= 2.06×10^{3}

74 = 65.5
= 6.55×10^{1}

75 = 20.1
= 2.01×10^{1}

76 = 388000
= 3.88×10^{5}

77 = -454
= -4.54×10^{2}

78 = 2.07
= 2.07×10^{0}

79 = 112000
= 1.12×10^{5}

80 = -0.146
= -1.46×10^{-1}

TMSCA 2020-2021 MS CA Test 5 Solutions to Word and Geometry Problems

11.

$$\mathbf{78(5) - 59 - 85 - 110 - 72}$$

12. Many calculators have a key to change kg to lbs. After doing that, divide by 2000. Otherwise, memorize that 2.2 lb. $\approx 1\ kg$.

$$\frac{2575(2.2)}{2000}$$

13. $\pi d = 562;\ \ d = \frac{562}{\pi}$

$r = \frac{d}{2}$;

Then use $\pi r^2 = \pi\left(\frac{\frac{562}{\pi}}{2}\right)^2$

24. $1723(1.03)^5$

25. $\left(\frac{259}{4}\right)\sqrt{2}$

26. $\frac{cats}{total}; \frac{1}{4} = \frac{x}{76}; x = \frac{76}{4}$

35. $64.99 + \frac{52.85}{2}$

36.

$$3(6^3) + 4(6^2) + 3(6) + 5$$

37. $\pi r + 2r = 137.8$

$$r(\pi + 2) = 137.8$$

$$r = \frac{137.8}{\pi + 2}$$

38. $w = \frac{A}{l} = \frac{2.21\ x\ 10^{-5}}{.0067}$

47. $(1.3)^2 = 1.690$ which shows a 69.0 % increase.

48.

$$7(24)(60)(60)(1{,}000{,}000{,}000)$$

49. $\sqrt{672000^2 + 239342.5^2}$

50. $\frac{sin\ 70}{1} = \frac{x}{490000}$

$$x = 490000(\sin 70)$$

59. $3x + 5x + 12x = 10887$

$$20x = 10887;\ \ x = \frac{10887}{20}$$

Largest = $12\left(\frac{10887}{20}\right)$

60. $5000(.0325) = .08x$

$$x = \frac{5000(.0325)}{.08}$$

61. $\frac{h^2\sqrt{3}}{3} = \frac{(.2889)^2\sqrt{3}}{3}$

62.

$4.3x(2x)(2) + 2x(x)(2) +$
$x(4.3x)(2) = 650$

$$17x^2 + 4x^2 + 8.6x^2 = 650$$

$$29.8x^2 = 650$$

$$x = \sqrt{\frac{650}{29.8}}$$

71. Area of triangle: $\frac{(24.6)^2\sqrt{3}}{4}$

Area of circle: $\pi\left(\frac{24.6}{2}\right)^2$

$$\frac{x}{100} = \frac{\left[\frac{(24.6)^2\sqrt{3}}{4}\right]}{\left[\pi\left(\frac{24.6}{2}\right)^2\right]}$$

$$x = \frac{(24.6)^2\sqrt{3}}{4}(100) \div \left[\pi\left(\frac{24.6}{2}\right)^2\right]$$

72. 50^3

73. $2d^2 = SA = 2(32.1)^2$

74. $A = \frac{Perimeter^2}{tan\left(\frac{180}{n}\right)(4n)}$

$$20702 = \frac{P^2}{tan\left(\frac{180}{8}\right)(32)}$$

$$P = \sqrt{20702\left[tan\left(\frac{180}{8}\right)(32)\right]}$$

Side = $\frac{P}{8}$

79. $\left(\frac{n}{2}\right)\left(\frac{n}{2} + 1\right) =$
$\left(\frac{668}{2}\right)\left(\frac{668}{2} + 1\right) = 334(335)$