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 #4 ©

NOVEMBER 9, 2019

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.

2019-2020 TMSCA Middle School Calculator Test #4

1. $-815 - 309$ ---------- 1=_____

2. $45 - 25 + 31$ ---------- 2=_____

3. $87 + 39 - 36$ ---------- 3=_____

4. $\pi - 14 - 8 + 16$ ---------- 4=_____

5. $1560 - 4510 - 4210 + 6060$ ---------- 5=_____

6. $202 - 176 - 54.5 - 139 + 244$ ---------- 6=_____

7. $(3.17 - 1.24) + (0.642 - 1.25 - 2.11)$ ---------- 7=_____

8. $5.62 + 2.98 + 7.19 + \pi + 1.18$ ---------- 8=_____

9. $344 \times 51.7 \times 52.1$ ---------- 9=_____

10. $1670 \times 22.1 \times 5000 \times 31.3$ ---------- 10=_____

11. Calculate the mode of the following list of numbers. 20, 4, $\sqrt{8}$, 10^2, $\sqrt[3]{64}$, and $\sqrt{16}$. ---------- 11=_____

12. Paul is making goodie bags for the kids for Halloween. He has eight 2-pound bags of candy and he wants to make 100 bags. Calculate the number of ounces of candy each bag will contain. - 12=_____oz.

13. The area of a square is 281 $in.^2$ Calculate the radius of a circle with the same area. ---------- 13=_____in.

14. $(224)[85 \times 79 \times 455]$ ---------- 14=_____

15. $(81)[116 \times 84/16]$ ---------- 15=_____

16. $\left[\frac{555}{122}\right][(585/149) - 2.67]$ ---------- 16=_____

17. $(203 + 504)[120 - 346 - 323]$ ---------- 17=_____

18. $\left[\frac{(8950/7120) - (6200/1920)}{0.398/(0.699)}\right]$ ---------- 18=_____

19. $\frac{(57/112) + (190/183)}{(6.70 \times 10^{-4} - 9.34 \times 10^{-4})}$ ---------- 19=_____

20. $(\pi)[310/413 \times 545/344] - 1.47$ ---------- 20=_____

21. $\frac{(\pi)(2/13)(2/14)}{59}$ ---------- 21=_____

22. $\frac{(\pi + 3.17 - 2.79)}{\{(0.00224 - 0.00966)/(856)\}}$ ---------- 22=_____

23. $\left[\frac{465 + 359}{839 - 1320}\right]\left[\frac{583}{1430}\right]$ ---------- 23=_____

24. The Fervor hockey team made 2 out of 34 shots on goal. Calculate the percentage of shots that were not made. ---------- 24=_____%

25. Two angles are supplementary. The first angle measures 85.2°. Calculate the measure of the other angle. ---------- 25=_____°

26. The tallest building in the world stands 2,717 feet tall. The deepest hole dug by man measures 40,230 feet deep. Calculate the number of miles between these two points. ---------- 26=_____mi.

27. $\dfrac{(0.0456 + 0.0381)(32.9 + 34.3)}{(6.34\text{x}10^{11})}$ ---------- 27=_____

28. $\dfrac{(1.27\text{x}10^{7}) + (1.37\text{x}10^{7})}{(-0.00226)(0.00663) - 8.49\text{x}10^{-6}}$ ---------- 28=_____

29. $\dfrac{(0.496 - 0.346)(\pi + 27.2)}{(5.67\text{x}10^{10})}$ ---------- 29=_____

30. $\dfrac{1}{-0.159} + \dfrac{1}{(\pi)(1.42 - 1.67)}$ ---------- 30=_____

31. $(9.45)\left[(2.40\text{x}10^{8}) - (4.18\text{x}10^{8})\right]$ ---------- 31=_____

32. $(0.0139)\left[\dfrac{0.00689}{(2.57\text{x}10^{-11})}\right]$ ---------- 32=_____

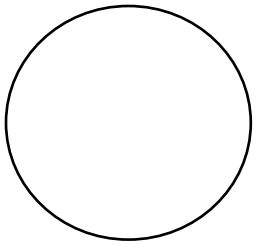
33. $\left[\dfrac{1/141}{1/28.9}\right] + [0.788]$ ---------- 33=_____

34. $\left[\dfrac{1/1020}{1/302}\right][6.32\text{x}10^{6}]$ ---------- 34=_____

35. The diameter of a sphere is 21. Calculate the ratio of the volume of the sphere to the surface area of the sphere. ---------- 35=_____

36. Two triangles are similar. The first triangle has sides that measure 7 in., 5 in., and 10 in. The second triangle has a perimeter of 316 in. Calculate the shortest side of the second triangle. ------- 36=_____in.

CIRCLE

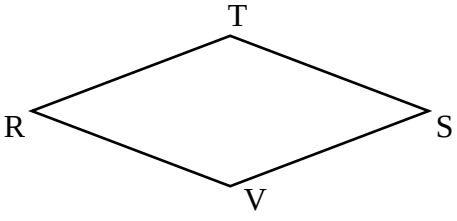


Area = 472.81

Diameter = ?

37=_____

RHOMBUS



RS = 18.21

TV = 8.95

Area = ?

38=_____

39. $\dfrac{(20400 + 17100)^3}{(0.0114 - 0.0118)^2}$ ---------- 39=_____

40. $\left[\dfrac{441}{2020}\right](3.56 + 1.2)^2$ ---------- 40=_____

41. $(5.88 + 4.1)^2(0.865 + 2.93)^2$ ---------- 41=_____

42. $\sqrt{(29.8/57.4) + 0.325 - 0.108}$ ---------- 42=_____

43. $\sqrt{15800 - 3840 + 12300} - \sqrt{21500}$ ---------- 43=_____

44. $(1/\pi)\sqrt[4]{\dfrac{0.021 + 0.02}{0.346 - 0.0813}}$ ---------- 44=_____

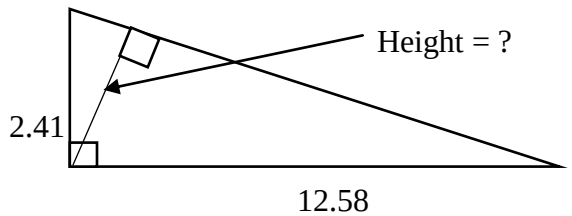
45. $\left[\sqrt[4]{(7.1/1.46)(1010)}\right]^5$ ---------- 45=_____

46. $\dfrac{1}{\sqrt{3250 + 1940 + 3250}} + \left(\dfrac{1}{\sqrt{67.9}}\right)^2$ ---------- 46=_____

47. The sum of two integers is 95. The difference of those two integers is 67. Calculate the value of the smallest integer. ---------- 47=_____INT.

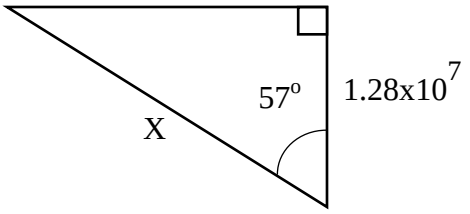
48. On a 30-60-90 triangle, the hypotenuse measures $3\sqrt[3]{3}$. Calculate the length of the side opposite the 60° angle. ---------- 48=_____

RIGHT TRIANGLE



49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\sqrt{\frac{1.58\text{x}10^{8}}{(0.587)(21.2)} + \frac{(42500 - 37300)}{(0.927 + 0.424)}}$ ---------- 51=_____

52. $\left[\frac{\sqrt{\sqrt{1.08\text{x}10^{5} - 26600}}}{-(8.99 - 10.5)}\right]^{3}[945 + 4570]$ ---------- 52=_____

53. $\frac{\sqrt{11.8 + \pi + 4.73}}{(4700 - 3780 + 24000)^{3}}$ ---------- 53=_____

54. $(0.656)^{2}\sqrt{(344)/(434)} - (0.0652 + 0.265)$ ---------- 54=_____

55. $\sqrt{\frac{(4.22\text{x}10^{5})(26600)}{(20100)(2.83\text{x}10^{5})}} - 1.26 + 1.33$ ---------- 55=_____

56. $(46.7)(3.21\text{x}10^{7})^{1/4} - [(99600)(1.01\text{x}10^{6})]^{1/3}$ ---------- 56=_____

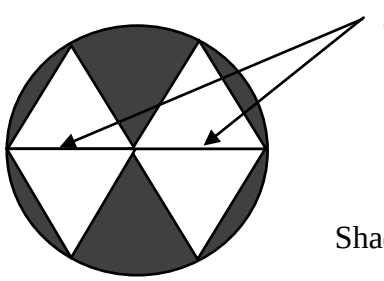
57. (rad) sin(105) + (72.5/85.1) ---------- 57=_____

58. $\sqrt{\frac{(80.4)(5350)}{(567) + (563)}} - 33.1$ ---------- 58=_____

59. Linda took out a loan from the bank for one year at 9.99% simple interest. If she had to pay $350 in interest, calculate the amount of the loan. ---------- 59=$_____

60. Calculate the number of distinct diagonals there are in a polygon with 71 sides. ---------- 60=_____INT.

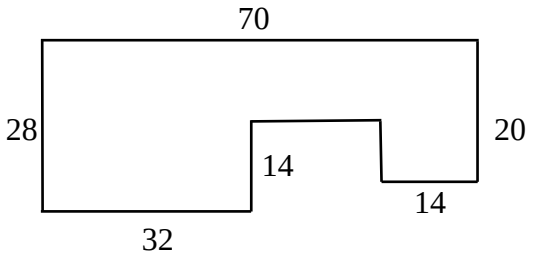
CIRCLE AND EQUILATERAL TRIANGLES



Shaded Area = ?

61= _____

POLYGON WITH ALL 90^{O} ANGLES



Area = ?

62=_____

63. $\frac{38!}{32!} + 12!$ ---------- 63=_____

64. (deg) $\frac{\tan(738°)}{99.4}$ ---------- 64=_____

65. $(7.62 \times 10^{8} - 5.50 \times 10^{8})^{7}(87100)$ ---------- 65=_____

66. (rad) $\frac{\sin(263)}{315/3730}$ ---------- 66=_____

67. (deg) $[8.04]\cos(17.4° - 25.7°)$ ---------- 67=_____

68. (rad) $\cos[(15.3 - 14.1)(0.478)]$ ---------- 68=_____

69. (deg) $\frac{\sin(143°)}{0.576 + 1.47}$ ---------- 69=_____

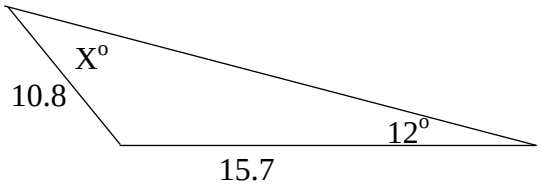
70. $(5590 - 3810)^{0.706 - 0.306}$ ---------- 70=_____

71. Ms. Saunders gave a test on policies at the school. It consisted of 10 True/False questions and 10 multiple choice questions with 5 answer choices each. Calculate the number of possible outcomes for this test. ---------- 71=_____

72. Calculate the probability of drawing a face card (J,Q, or K) from a standard deck of cards. ---------- 72=_____

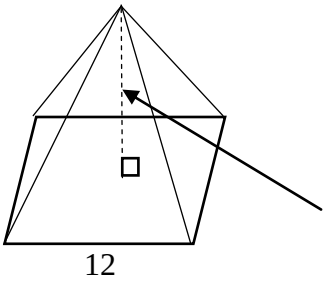
SCALENE TRIANGLE

X^o = ?



73=_____

SQUARE BASED PYRAMID



Volume = 672

Height = ?

12

74=_____

75. $\dfrac{(3.46)^{0.306}(3.31)^{0.524}}{(1.48 - 0.724)^{-12}}$ ---------- 75=_____

76. $\dfrac{\text{Log}(1.41\text{x}10^{8} + 3.70\text{x}10^{8})}{42.5}$ ---------- 76=_____

77. $\text{Log}\sqrt{\dfrac{275 - 57.8}{(6.95)(122)}}$ ---------- 77=_____

78. $\dfrac{\text{Log}[2470 + (3.29)(849)]}{0.00669 + \text{Log}[0.387 + 0.751]}$ ---------- 78=_____

79. $2 + 4 + 6 + \ldots + 552$ ---------- 79=_____

80. $\dfrac{1}{(0.48)} + \dfrac{1}{3(0.48)^3} + \dfrac{1}{5(0.48)^5} + \dfrac{1}{7(0.48)^7}$ ---------- 80=_____

2019-2020 TMSCA Middle School Calculator Test #4 Answer Key

Page 1

1 = -1120
= -1.12×10^{3}

2 = 51.0
= 5.10×10^{1}

3 = 90.0
= 9.00×10^{1}

4 = -2.86
= -2.86×10^{0}

5 = -1100
= -1.10×10^{3}

6 = 76.5
= 7.65×10^{1}

7 = -0.788
= -7.88×10^{-1}

8 = 20.1
= 2.01×10^{1}

9 = 927000
= 9.27×10^{5}

10 = 5.78×10^{9}

11 = 4.00
= 4.00×10^{0}

12 = 2.56
= 2.56×10^{0}

13 = 9.46
= 9.46×10^{0}

Page 2

14 = 6.84×10^{8}

15 = 49300
= 4.93×10^{4}

16 = 5.71
= 5.71×10^{0}

17 = -388000
= -3.88×10^{5}

18 = -3.46
= -3.46×10^{0}

19 = -5860
= -5.86×10^{3}

20 = 2.27
= 2.27×10^{0}

21 = 0.00117
= 1.17×10^{-3}

22 = -406000
= -4.06×10^{5}

23 = -0.698
= -6.98×10^{-1}

24 = 94.1
= 9.41×10^{1}

25 = 94.8
= 9.48×10^{1}

26 = 8.13
= 8.13×10^{0}

Page 3

27 = 8.87×10^{-12}

28 = -1.12×10^{12}

29 = 8.03×10^{-11}

30 = -7.56
= -7.56×10^{0}

31 = -1.68×10^{9}

32 = 3.73×10^{6}

33 = 0.993
= 9.93×10^{-1}

34 = 1.87×10^{6}

35 = 3.50
= 3.50×10^{0}

36 = 71.8
= 7.18×10^{1}

37 = 24.5
= 2.45×10^{1}

38 = 81.5
= 8.15×10^{1}

Page 4

39 = 3.30×10^{20}

40 = 4.95
= 4.95×10^{0}

41 = 1430
= 1.43×10^{3}

42 = 0.858
= 8.58×10^{-1}

43 = 9.13
= 9.13×10^{0}

44 = 0.200
= 2.00×10^{-1}

45 = 41100
= 4.11×10^{4}

46 = 0.0256
= 2.56×10^{-2}

47 = 14 INT.

48 = 3.75
= 3.75×10^{0}

49 = 2.37
= 2.37×10^{0}

50 = 2.35×10^{7}

2019-2020 TMSCA Middle School Calculator Test #4 Answer Key

Page 5

51 = 7410
= 7.41×10^{3}

52 = 7.72×10^{6}

53 = 2.87×10^{-13}

54 = 0.0529
= 5.29×10^{-2}

55 = 1.47
= 1.47×10^{0}

56 = -1140
= -1.14×10^{3}

57 = -0.119
= -1.19×10^{-1}

58 = -13.6
= -1.36×10^{1}

59 = $3503.50

60 = 2414 INT.

Page 6

61 = 622
= 6.22×10^{2}

62 = 1510
= 1.51×10^{3}

63 = 2.47×10^{9}

64 = 0.00327
= 3.27×10^{-3}

65 = 1.68×10^{63}

66 = -9.23
= -9.23×10^{0}

67 = 7.96
= 7.96×10^{0}

68 = 0.840
= 8.40×10^{-1}

69 = 0.294
= 2.94×10^{-1}

70 = 20.0
= 2.00×10^{1}

71 = 1.00×10^{10}

72 = 0.231
= 2.31×10^{-1}

Page 7

73 = 17.6
= 1.76×10^{1}

74 = 14.0
= 1.40×10^{1}

75 = 0.0954
= 9.54×10^{-2}

76 = 0.205
= 2.05×10^{-1}

77 = -0.296
= -2.96×10^{-1}

78 = 59.2
= 5.92×10^{1}

79 = 76500
= 7.65×10^{4}

80 = 37.3
= 3.73×10^{1}

TMSCA 19-20 MS CA Test #4 Solutions to Word and Geometry Problems

11. Mode is 4 because more expressions = 4 than any other number.

12. $\frac{8(32)}{100}$

13. $281 = \pi r^2$ so $r = \sqrt{\frac{281}{\pi}}$

24. $\frac{32}{34} x\ 100$

25. 180 – 85.2

26. $\frac{40230+2717}{5280}$

35. $\frac{\frac{4}{3}\pi r^3}{4\pi r^2} = \frac{1}{3}r = \frac{1}{3}\left(\frac{21}{2}\right)$

36. $7x + 5x + 10x = 316$

$$x = \frac{316}{7+5+10}$$

Multiply by 5 to get the shortest side.

37. $\pi r^2 = 472.81$

$$r = \sqrt{\frac{472.81}{\pi}}$$

Diameter = 2r.

38. $\frac{18.21(8.95)}{2}$

47. $\begin{Bmatrix} x + y = 95 \\ x - y = 67 \end{Bmatrix}$

$\begin{Bmatrix} x + y = 95 \\ -x + y = -67 \end{Bmatrix}$ Add these

$$2y = 28; y = 14$$

48. If n is the hypotenuse, the short leg is n/2. The long leg is $\left(\frac{n}{2}\right)\sqrt{3} = \left(\frac{3\sqrt[3]{3}}{2}\right)\sqrt{3}$

49. Hypotenuse of large triangle = $\sqrt{2.41^2 + 12.58^2}$
There are similar right triangles. Small, medium and large.
L. $\frac{short\ leg}{hypotenuse} = M\ \frac{short\ leg}{hypotenuse}$

$$\frac{2.41}{\sqrt{2.41^2 + 12.58^2}} = \frac{x}{12.58}$$

$$x = \frac{2.41(12.58)}{\sqrt{2.41^2 + 12.58^2}}$$

50. $\frac{\boldsymbol{cos\ 57}}{\boldsymbol{1}} = \frac{\boldsymbol{1.28\ x\ 10^7}}{\boldsymbol{x}}$

$$x = \frac{1.28\ x\ 10^7}{\cos 57}$$

59. I = Prt

$$350 = P(.0999)1$$

$$P = \frac{350}{.0999}$$

60. $\frac{n(n-3}{2}) = \frac{71(68)}{2}$

61. $\pi(21)^2 - 4\left(\frac{(21)^2\sqrt{3}}{4}\right)$

62.

$$28(32) + 14(70 - 32 - 14) + 14(20)$$

71. $2^{10}\ (5^{10})$

72. $\frac{12}{52}$

73. $\frac{15.7}{\sin x} = \frac{10.8}{\sin 12}$

$$x = asin\left[\frac{(15.7)\ \sin 12}{10.8}\right]$$

74. V = $\frac{1}{3}(b^2)$h

$672 = \frac{1}{3}(12^2)$h

Height = $\frac{3(672)}{144}$