8

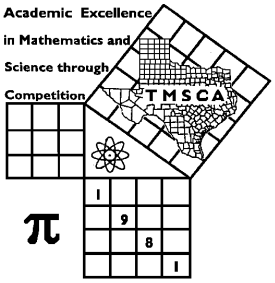
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 # 8 ©

J A N U A R Y 2 3 , 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 #8

1. 575 – 425 ---------- 1=_____

2. –19 – 12 + 33 ---------- 2=_____

3. 8.19 + 3.7 + 6.19 ---------- 3=_____

4. π + 11 + 6 + 6 ---------- 4=_____

5. 317 – 294 – 651 + 138 ---------- 5=_____

6. 110 + 141 – 202 – 82 + 225 ---------- 6=_____

7. 1.73 – 0.205 + 1.84 – 1.77 – 0.373 ---------- 7=_____

8. (1.27 + 0.703 – 0.305) – (2.39 + 2.13) ---------- 8=_____

9. 150 x 94.1 x 202 ---------- 9=_____

10. 551 x 115 x 1420 x 104 ---------- 10=_____

11. Mirim worked all the problems on her calculator test up to and including number 74. She missed 9 total problems out of the ones she did. Calculate her score. ---------- 11=_____INT.

12. Calculate the Greatest Common Factor of 448 and 360. ---------- 12=_____INT.

13. Calculate the number that is 0.22% smaller than 54.8. ---------- 13=_____

14. $(-108)[79 \times 119 \times 159]$ ---------- 14=_____

15. $39 - [83/95 + 2.39]$ ---------- 15=_____

16. $\{145/21\}\left[\frac{61}{129 + 184}\right]$ ---------- 16=_____

17. $\{(297)(102 - 94)(209)\} - 71000$ ---------- 17=_____

18. $\left[\frac{267/342}{491/200}\right]\{7.84\text{x}10^{-4} + 3.69\text{x}10^{-4} - 4.93\text{x}10^{-4}\}$ ------- 18=_____

19. $\left[\frac{(8940/1880) - (5880/6040)}{57.9/(105)}\right]$ ---------- 19=_____

20. $\frac{(\pi)(69/32)(17/9)}{501}$ ---------- 20=_____

21. $\frac{0.025 + 0.0708 + 0.0237}{(0.113)(0.00238)(1.10\text{x}10^{-4})}$ ---------- 21=_____

22. $\frac{(3630 \times 4000)/4710}{(602 \times 0.00443) + 2.61}$ ---------- 22=_____

23. $\frac{(0.194 + 0.227 - 1.27)}{\{(6080 - 1890)/(0.0637)\}}$ ---------- 23=_____

24. Calculate the overall average of eight numbers if the average of the first three is 225 and the average of the last five numbers is 181. 24=_____

25. The sum of four consecutive integers is 186. Calculate the product of the four integers. ---------- 25=_____

26. The car priced at 18,959.00 that Frank wants to buy is discounted 15%. There is a $250 origination fee, $75.00 title fee and a 6.25% sales tax added to the discounted price. Calculate the total Frank will have to pay for the car. All fees are taxed. ---------- 26=$_____

27. $\dfrac{(4.02\text{x}10^{7}) + (4.62\text{x}10^{7})}{(-0.0043)(0.00332) - 7.22\text{x}10^{-6}}$ ---------- 27=_____

28. $(0.00135)[(169/149)(0.101 + 0.0943)]$ ---------- 28=_____

29. $[4280 - (6240 + 4970)] + [(-0.94)(6070 - 2100)]$ ------ 29=_____

30. $\dfrac{1}{1190} + \dfrac{1}{(3280 - 2850)}$ ---------- 30=_____

31. $(0.00282)\left[\dfrac{0.0131}{(3.24\text{x}10^{6})}\right]$ ---------- 31=_____

32. $(28.6)\left[(5.22\text{x}10^{7}) - (8.11\text{x}10^{6})\right]$ ---------- 32=_____

33. $\left[\dfrac{1/124}{1/120}\right] + [0.637]$ ---------- 33=_____

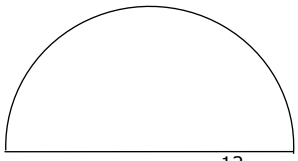
34. $\left[\dfrac{1/144}{1/430}\right][2.02\text{x}10^{6}]$ ---------- 34=_____

35. A holding tank in the shape of a cube can hold 552 gallons of fluid. calculate the length of each side of the tank in feet. ---------- 35=_____ft.

36. Calculate the percent change from one trillion to one billion. ----- 36=_____%

37.

SEMICIRCLE



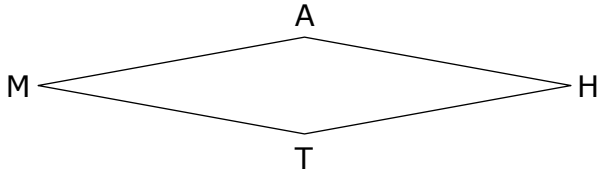
$5.81 \text{ x } 10^{12}$

Area = ?

37=_____

38.

RHOMBUS



$AT = 1.70 \text{ x } 10^{5}$
$\text{Area} = 7.91 \text{ x } 10^{10}$
MH = ?

38=_____

39. $(0.236 + 0.271 + 0.26)^2(0.767 + 0.87)^2$ ---------- 39=_____

40. $(0.183 + 0.343)^2(307 + 270)^2$ ---------- 40=_____

41. $\dfrac{(33000 + 54600)^2}{(0.546 - 0.796)^3}$ ---------- 41=_____

42. $\sqrt{(2910/6040) + 0.326 - 0.283}$ ---------- 42=_____

43. $(1/\pi)\sqrt[3]{\dfrac{0.0216 + 0.0335}{0.0243 - 0.00911}}$ ---------- 43=_____

44. $\sqrt{66.1} + \sqrt{392 + 375} - (\pi)\sqrt{587}$ ---------- 44=_____

45. $\left[\sqrt[3]{(11.1/6.05)(1270)}\right]^4$ ---------- 45=_____

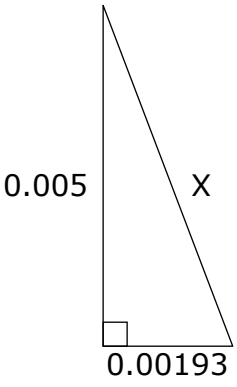
46. $\dfrac{(4880 + 3220)^{1/5}}{(34500 - 29500)^{1/5}}$ ---------- 46=_____

47. Two vehicles travel perpendicular to each other. One is traveling twice the speed of the other. In four hours they are 350 miles apart. Calculate the speed of the slower vehicle in miles per hour. 47=_____mph

48. Calculate the slope of the line that is perpendicular to the line $-7x+5y = 32$ ---------- 48=_____

49.

RIGHT TRIANGLE

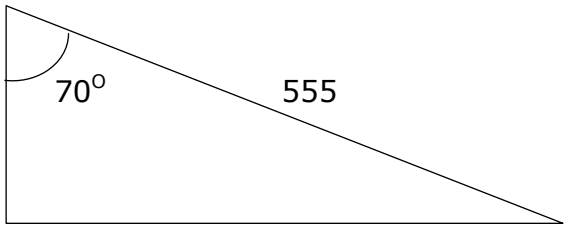


X = ?

49=_____

50.

RIGHT TRIANGLE



Perimeter = ?

50=_____

51. $\dfrac{\sqrt{2.31 + \pi + 1.04}}{(2.17\text{x}10^5 - 1.42\text{x}10^5 + 2.30\text{x}10^5)^3}$ ---------- 51=_____

52. $\sqrt{\dfrac{0.0877}{(0.0568)(0.0232)}} + \dfrac{(727 - 1320)}{(15.3 + 14.9)}$ ---------- 52=_____

53. $\left[\dfrac{\sqrt{\sqrt{3.46 - 2.11}}}{-(33400 - 18800)}\right]^3 [1.35 + 2.53]$ ---------- 53=_____

54. $(51.7)(3.50\text{x}10^8)^{1/4} - [(4.79\text{x}10^7)(3.52\text{x}10^8)]^{1/4}$ ------ 54=_____

55. $(3.17)^2 \sqrt{(82)/(56.7)} - (2.86 + 5.78)$ ---------- 55=_____

56. $\sqrt{\dfrac{1/(179 - 56.1)}{(23.2)(293 + 46.9)^2}}$ ---------- 56=_____

57. $(\text{rad}) \sin(24.7) + (108/23.4)$ ---------- 57=_____

58. $\sqrt{\dfrac{(12.8)(194)}{(3510) + (4770)}} - 0.763$ ---------- 58=_____

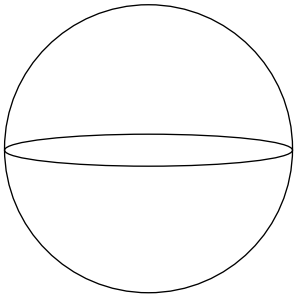
59. The great circumference of a sphere is 5.22 inches. Calculate the total surface area of sphere in square inches. ---------- 59=_____in^2.

60. In a bag of assorted marbles the probability of drawing out a red marble is 23/100, the probability of drawing out a green marble is 7/50, and the probability of drawing out a blue marble is 1/5. Calculate the probability of not drawing out any of these three colors. ---------- 60=_____

61.

SPHERE

Volume = 12500



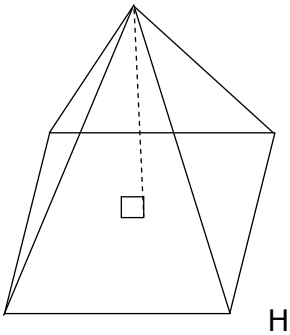
Radius = ?

61=_____

62.

SQUARE BASED PYRAMID

Volume = 50000



Height = Base Edge = ?

62=_____

63. $\frac{10!}{6!} + 8!$ ---------- 63=_____

64. $(115 - \pi)e^{0.101}$ ---------- 64=_____

65. (deg) $\frac{\cos(2.21°)}{137}$ ---------- 65=_____

66. (deg) $\tan(20.9° - 148°) + 1.23$ ---------- 66=_____

67. (rad) $\frac{\tan(85.7)}{502/99.5}$ ---------- 67=_____

68. (deg) $\frac{\sin(359°)}{428 + 720}$ ---------- 68=_____

69. (rad) $(2650)\sin(139)$ ---------- 69=_____

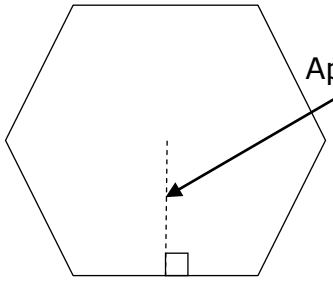
70. $(1320 - 867)^{0.209 - 0.344}$ ---------- 70=_____

71. Twenty-two teams are competing at the Math/Science meet. Calculate how many different ways the teams could place 1 – 10 at this meet. Assume there are no ties. ---------- 71=_____

72. According to Britannica, The Leaning Tower of Pisa leans 5.5 degrees due to a foundation that shifted. When the sun and the building form a 90 degree angle, the shadow cast by the building is 1939.89 feet long. How tall is The Leaning Tower of Pisa in feet. --------- 72=_____ft.

73.

REGULAR HEXAGON

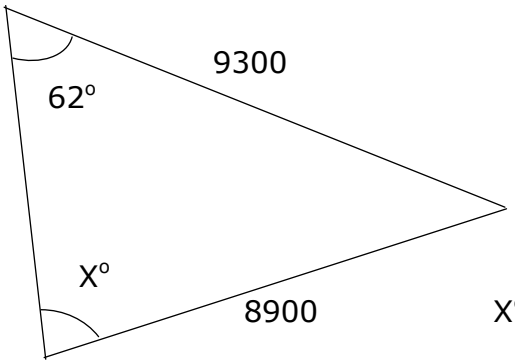


Area = ?

73=_____

74.

SCALENE TRIANGLE



X° = ?

74=_____

75. $\dfrac{(13.3)^{0.561}(10.3)^{0.16}}{(14.7 - 3.79)^{-11}}$ ---------- 75=_____

76. $\dfrac{0.0522 + \sqrt{(0.0739)(0.102)} + (0.182)(0.397)}{\sqrt{\sqrt{0.00389 + 0.00714}}}$ ---------- 76=_____

77. $2\text{Log}\sqrt{\dfrac{(\pi)(145)}{586 + 390}}$ ---------- 77=_____

78. $\dfrac{(e^{0.464})(e^{0.791})(e^{0.621})}{\text{Ln}(2.25 + 1.46)}$ ---------- 78=_____

79. $1 + 2 + 3 + \ldots + 491$ ---------- 79=_____

80. $\dfrac{1}{(0.649)} + \dfrac{1}{3(0.649)^3} + \dfrac{1}{5(0.649)^5} + \dfrac{1}{7(0.649)^7}$ ------ 80=_____

2020 – 2021 TMSCA Middle School Calculator Test 8 Answer Key

Page 1

1 = 150
= 1.50×10^{2}

2 = 2.00
= 2.00×10^{0}

3 = 18.1
= 1.81×10^{1}

4 = 26.1
= 2.61×10^{1}

5 = -490
= -4.90×10^{2}

6 = 192
= 1.92×10^{2}

7 = 1.22
= 1.22×10^{0}

8 = -2.85
= -2.85×10^{0}

9 = 2.85×10^{6}

10 = 9.36×10^{9}

11 = 289 INT.

12 = 8 INT.

13 = 54.7
= 5.47×10^{1}

Page 2

14 = -1.61×10^{8}

15 = 35.7
= 3.57×10^{1}

16 = 1.35
= 1.35×10^{0}

17 = 426000
= 4.26×10^{5}

18 = 0.000210
= 2.10×10^{-4}

19 = 6.86
= 6.86×10^{0}

20 = 0.0255
= 2.55×10^{-2}

21 = 4.04×10^{6}

22 = 584
= 5.84×10^{2}

23 = -1.29×10^{-5}

24 = 198
= 1.98×10^{2}

25 = 4.67×10^{6}

26 = $17,467.66

Page 3

27 = -4.02×10^{12}

28 = 0.000299
= 2.99×10^{-4}

29 = -10700
= -1.07×10^{4}

30 = 0.00317
= 3.17×10^{-3}

31 = 1.14×10^{-11}

32 = 1.26×10^{9}

33 = 1.60
= 1.60×10^{0}

34 = 6.03×10^{6}

35 = 4.19
= 4.19×10^{0}

36 = -99.9
= -9.99×10^{1}

37 = 1.33×10^{25}

38 = 931000
= 9.31×10^{5}

Page 4

39 = 1.58
= 1.58×10^{0}

40 = 92100
= 9.21×10^{4}

41 = -4.91×10^{11}

42 = 0.724
= 7.24×10^{-1}

43 = 0.489
= 4.89×10^{-1}

44 = -40.3
= -4.03×10^{1}

45 = 30900
= 3.09×10^{4}

46 = 1.10
= 1.10×10^{0}

47 = 39.1
= 3.91×10^{1}

48 = -0.714
= -7.14×10^{-1}

49 = 0.00536
= 5.36×10^{-3}

50 = 1270
= 1.27×10^{3}

2020 – 2021 TMSCA Middle School Calculator Test 8 Answer Key

Page 5

51 = 8.98×10^{-17}

52 = -11.5
= -1.15×10^{1}

53 = -1.56×10^{-12}

54 = -4320
= -4.32×10^{3}

55 = 3.44
= 3.44×10^{0}

56 = 5.51×10^{-5}

57 = 4.20
= 4.20×10^{0}

58 = -0.215
= -2.15×10^{-1}

59 = 8.67
= 8.67×10^{0}

60 = 0.430
= 4.30×10^{-1}

Page 6

61 = 14.4
= 1.44×10^{1}

62 = 53.1
= 5.31×10^{1}

63 = 45400
= 4.54×10^{4}

64 = 124
= 1.24×10^{2}

65 = 0.00729
= 7.29×10^{-3}

66 = 2.55
= 2.55×10^{0}

67 = 0.238
= 2.38×10^{-1}

68 = -1.52×10^{-5}

69 = 1840
= 1.84×10^{3}

70 = 0.438
= 4.38×10^{-1}

71 = 2.35×10^{12}

72 = 186
= 1.86×10^{2}

Page 7

73 = 0.188
= 1.88×10^{-1}

74 = 67.3
= 6.73×10^{1}

75 = 1.62×10^{12}

76 = 0.652
= 6.52×10^{-1}

77 = -0.331
= -3.31×10^{-1}

78 = 4.98
= 4.98×10^{0}

79 = 121000
= 1.21×10^{5}

80 = 7.44
= 7.44×10^{0}

TMSCA 2020-2021 MS CA Test 8 Solutions to Word and Geometry Problems

11. $74\ x\ 5 - 9\ x\ 9$

12. $448 = 2^6(7)$
$360 = 2^3 \cdot 3^2 \cdot 5$
GCF = 2^3

13. 54.8 – .0022(54.8)

24. $\frac{3(225)+5(181)}{8}$

25. The four integers are represented by x, x+1, x+2, x+3. Sum of these is 4x + 6
4x + 6 = 186; 4x = 180; x = 45.
Product = 45(46)(47)(48)

26.
$[(18959\ x\ .85) + 250 + 75](1.0625)$

35. 231 cubic in = 1 gal.

$$\frac{552(231)}{12^3} = cu.ft.$$

Side = $\sqrt[3]{\frac{552(231)}{12^3}}$

36. $\frac{\mathbf{10^9 - 10^{12}}}{\mathbf{10^{12}}}$ (100)

37. $\frac{\pi r^2}{2}; r = \frac{5.81\ x\ 10^{12}}{2}$

$$A = \pi\left(\frac{5.81\ x\ 10^{12}}{2}\right)^2 \div 2$$

38. $\frac{(\overline{AT})(\overline{MH})}{2} = 7.91\ x\ 10^{10}$

$\overline{MH} = \frac{(7.91\ x\ 10^{10})(2)}{1.70\ x\ 10^5}$

47. x is rate of slower vehicle. Distance of slower vehicle in 4 hours = 4x. Distance of faster vehicle in 4 hours = 8x. Use Pythagorean Theorem to solve for x.

$$(4x)^2 + (8x)^2 = (350)^2$$
$$16x^2 + 64x^2 = 122500$$
$$80x^2 = 122500$$
$$x = \sqrt{\frac{122500}{80}}$$

48. slope of given line is 7/5. Slope of perpendicular line is $= \frac{-5}{7}$

49. $\sqrt{(.005)^2 + (.00193)^2}$

50. $x =$ short leg;
$\frac{x}{555} = \frac{\cos 70}{1}$
$$x = 555(\cos 70)$$
$y =$ long leg; $\frac{y}{555} = \frac{\sin 70}{1}$
$$y = 555(\sin 70)$$
Perimeter = $555 + x + y$
$555 + 555(\cos 70) + 555(\sin 70)$

59. C = $2\pi r = 5.22\ so\ r = \frac{5.22}{2\pi}$
SA = $4\pi r^2 = 4\pi\left(\frac{5.22}{2\pi}\right)^2$

60. $1 - \frac{23}{100} - \frac{7}{50} - \frac{1}{5}$

61. $V = \frac{4}{3}\pi r^3 = 12500$

$$r = \sqrt[3]{\frac{12500(3)}{4\pi}}$$

62.
$V = \frac{1}{3}Bh = \frac{1}{3}x^2 \cdot x = 50000$
$\frac{1}{3}x^3 = 50000;\ x = \sqrt[3]{150000}$

71. This is permutations of 22, choose 10.

$$\frac{22!}{(22-10)!}$$

72. This forms a right triangle with an angle of 84.5 degrees. The hypotenuse is 1939.89°.
$\frac{\cos 84.5}{1} = \frac{x}{1939.89}$

$$x = 1939.48[cos(84.5)]$$

73. A hexagon consists of 6 equilateral triangles. Use

$$6\left(\frac{h^2\sqrt{3}}{3}\right) = 6\left(\frac{(.233)^2\sqrt{3}}{3}\right)$$

74. $\frac{\sin 62}{8900} = \frac{sinx}{9300}$

$$x = sin^{-1}\left\{\frac{9300(sin62)}{8900}\right\}$$