8

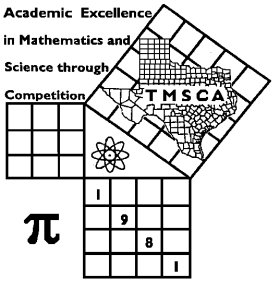
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

PLACE LABEL BELOW

Name:_____ School:_____

SS/ID Number:_____ City:_____

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



TMSCA MIDDLE SCHOOL

CALCULATOR

TEST #4©

NOVEMBER 14, 2015

GENERAL DIRECTIONS

I. About this test:
  A. You will be given 30 minutes to take this test.
  B. There are 80 problems on this test.

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.

2015-2016 TMSCA Middle School Calculator Test #4

1. $-4940 + 3860$ ---------- 1=_____

2. $38 - 54 + 53$ ---------- 2=_____

3. $-1310 + 343 - 946$ ---------- 3=_____

4. $\pi + 10 - 9 - 17$ ---------- 4=_____

5. $150 + 195 - 160 - 158$ ---------- 5=_____

6. $102 + 73.5 - 85.7 - 73.4 - 58.6$ ---------- 6=_____

7. $(-2.5 + 1.95 - 0.68) - (0.633 + 2.81)$ ---------- 7=_____

8. $\pi + 1.85 + 1.24 + 1.67 + 1.91$ ---------- 8=_____

9. $57.9 \times 52.1 \times 33.9$ ---------- 9=_____

10. $1880 \times 332 \times 1390 \times 396$ ----------10=_____

11. Lori finished her calculator test. She skipped just two problems and got 18 others incorrect. Calculate her score. ----------11=_____INT.

12. Farmer John bought 560 pounds of grain. Convert this weight to kilograms. ----------12=_____kg

13. The lengths of the sides of a triangle are in the ratio of 8:5:6. If the perimeter is 121 cm, calculate the length of the longest side. ----------13=_____cm

14. (294/230)[83 – 230] ----------14=_____

15. –91 – [98/54 + 4.53] ----------15=_____

16. $\left[\frac{140}{50}\right]$[(374/65) + 2.24] ----------16=_____

17. {754/423}$\left[\frac{197}{461 + 600}\right]$ ----------17=_____

18. $\frac{[0.00223/(0.00213)]/6.45}{(0.116 \times 0.136)(0.0251)}$ ----------18=_____

19. $\frac{(21/96) + (42/185)}{(0.0783 - 0.0372)}$ ----------19=_____

20. $\frac{(\pi)(11/9)(5/5)}{13}$ ----------20=_____

21. $\frac{218}{(292 - 123)} - \frac{(253 - 74)}{285}$ ----------21=_____

22. $\frac{(\pi)(27/51)(47/72)}{(73/51)}$ ----------22=_____

23. $\frac{(0.00814 + 0.00786 - 0.00268)}{\{(0.401 - 1.9)/(84.9)\}}$ ----------23=_____

24. The harmonic mean of a set of numbers is the reciprocal of the arithmetic mean of their reciprocals. Calculate the harmonic mean of 4 and 9. ----------24=_____INT.

25. Two hundred seventy thousand four hundred three attended the event over a three day period. This was only seven-eighths of the expected turn out. Calculate the expected turn out. ----------25=_____INT.

26. The diagonal of a square is 125.9 inches. Calculate the perimeter of the square in feet. ----------26=_____ft.

27. $\dfrac{(0.171 + 0.213)(0.062 + 0.105)}{(4.57\text{x}10^{10})}$ ----------27=_____

28. $[1460 - (2110 + 1690)] + [(0.549)(779 - 2020)]$ ----------28=_____

29. $\dfrac{(41.7 - 24.7)(1.83 + 0.862)}{(4.70\text{x}10^{11})}$ ----------29=_____

30. $\dfrac{1}{-11.7} + \dfrac{1}{(\pi)(0.976 - 8.68)}$ ----------30=_____

31. $(\pi)\left[(8.61\text{x}10^{8}) - (5.36\text{x}10^{8})\right]$ ----------31=_____

32. $\dfrac{1}{-0.439} + \dfrac{1}{(0.155 - 0.826)}$ ----------32=_____

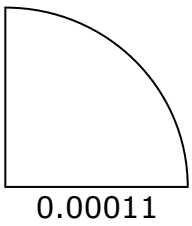
33. $\left[\dfrac{1/1280}{1/1460}\right][9.72\text{x}10^{5}]$ ----------33=_____

34. $\dfrac{1}{50.4} - \dfrac{1}{(275 + 125)}$ ----------34=_____

35. Steven can complete the project in 2.75 hours. Stuart can do the same project in half that time. Calculate how long it would take to complete the project together. ----------35=_____hrs.

36. A pile of quarters and dimes has a value of $14.30. There are three times as many dimes as quarters. Calculate the number of quarters. ---36=_____INT.

QUARTER CIRCLE

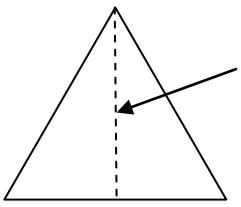


0.00011

Area = ?

37=_____

EQUILATERAL TRIANGLE



Height = 5.012

Perimeter = ?

38=_____

39. $\dfrac{(22300 + 27700)^2}{(0.00567 - 0.00963)^3}$ ----------39=_____

40. $(13.4 + 10.7)^2(636 + 508)^2$ ----------40=_____

41. $\sqrt[4]{\dfrac{514 + 125}{60.1 - 35.6}}$ ----------41=_____

42. $\sqrt{(227/200) + 0.55 - 0.31}$ ----------42=_____

43. $\sqrt{34.7} + \sqrt{22.4 + 36.5} - (\pi)\sqrt{21.2}$ ----------43=_____

44. $(1/(0.01))(4260 - 2030)^3$ ----------44=_____

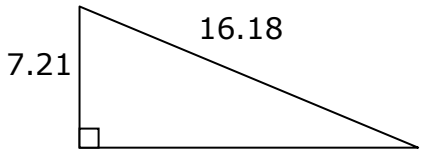
45. $\left[\sqrt[3]{(2.46/1.6)(57000)}\right]^2$ ----------45=_____

46. $(622)\sqrt[4]{229 + 340 - 310}$ ----------46=_____

47. A 10 foot piece of pipe is cut into two pieces. One piece is 15 inches longer than the other. Calculate the length of the shorter piece of pipe in feet. ----------47=_____ft.

48. Jordan drives to her destination at 60 miles per hour and arrives one hour early. If she drives at 40 miles per hour she will arrive an hour late. Calculate the speed she should drive to arrive right on time. ----------48=_____mph.

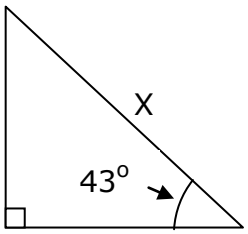
RIGHT TRIANGLE



Perimeter = ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\sqrt{\frac{1.57\text{x}10^{7}}{(32.7)(69.9)} + \frac{(442 - 400)}{(0.16 + 0.216)}}$ ----------51=_____

52. $\left[\frac{2000 - 748 + \sqrt{1.80\text{x}10^{8}/178}}{-2.13 + 6.13}\right]^{3}$ ----------52=_____

53. $\frac{(2.00\text{x}10^{5} + 1.32\text{x}10^{5} - 1.88\text{x}10^{5})^{2}}{\sqrt{124 + 320 + 295}}$ ----------53=_____

54. $(371)^{2}\sqrt{(0.448)/(0.808)} - (54500 + 81700)$ ----------54=_____

55. $2.5 + \sqrt{(4320)/(153)} - (0.592 + 2.21)^{2}$ ----------55=_____

56. $(1470)(1.58\text{x}10^{7})^{1/3} - [(2.61\text{x}10^{10})(2.76\text{x}10^{11})]^{1/4}$ ----------56=_____

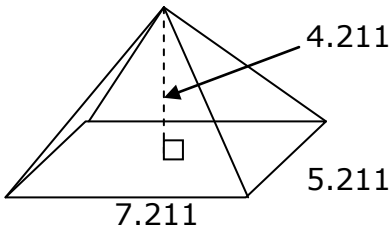
57. $\sqrt{\frac{(5.48)(333)}{(3.29) + (2.65)}} + 1/(1.77)^{-5}$ ----------57=_____

58. (rad) sin(858) + (420/549) ----------58=_____

59. The radius of a right circular cone is 481 inches. If the volume of the cone is 2821 inches cubed, calculate the height of the cone in inches. ----------59=_____in.

60. Calculate the probability of flipping a fair coin seven times and always landing on heads. ----------60=_____

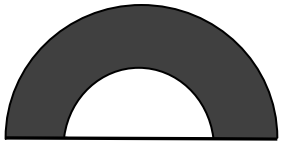
RECTANGULAR BASED PYRAMID



Volume = ?

61=_____

SEMICIRCLES



Radius of large semicircle = 14

Radius of small semicircle = 7

Shaded Area = ?

62=_____

63. $\frac{36!}{32!} + 11!$ ----------63=_____

64. (deg) $\frac{\cos(24.1°)}{215}$ ----------64=_____

65. $(1.35\text{x}10^5 - 1.12\text{x}10^5)^5(7.00\text{x}10^5)$ ----------65=_____

66. (deg) $[58.9]\sin(27° - 65°)$ ----------66=_____

67. (deg) $(23.7 - 57.5)\tan(4.45°) + 1.66$ ----------67=_____

68. (rad) $\cos[(17.9 - 25.1)(53.4)]$ ----------68=_____

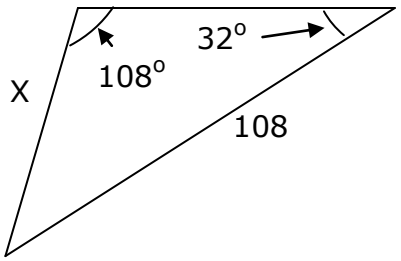
69. (deg) $\frac{\sin(3.43°) - \tan(3.43°)}{\sin(3.43°)}$ ----------69=_____

70. $(81.8 - 10.9)^{0.0425 - 0.0295}$ ----------70=_____

71. Calculate the amount of interest earned on $10,000 at 5½% for 10 years if the interest is compounded annually. ----------71=$_____

72. Calculate the length of a 93^{o} 22 minute arc on a circle with a radius of 277.5 meters. Given 60 min. = 1 degree. ----------72=_____m

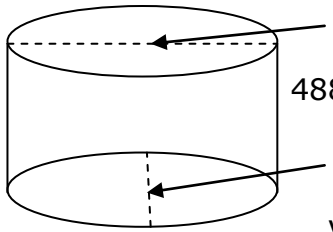
SCALENE TRIANGLE



X = ?

73=_____

RIGHT ELLIPTICAL SOLID



Volume = ?

74=_____

75. $\frac{(11)^{0.229}(1.53)^{0.651}}{(1.12 - 0.573)^{-7}}$ ----------75=_____

76. $\frac{\text{Log}(1.83\text{x}10^{7} + 1.18\text{x}10^{7})}{23.6}$ ----------76=_____

77. $\frac{3.12 - \pi}{\text{Log}(43700 + 45100)}$ ----------77=_____

78. $\frac{(e^{0.907})(e^{0.57})(e^{0.299})}{\text{Ln}(5.5 + 8.8)}$ ----------78=_____

79. $2 + 4 + 6 + \ldots + 964$ ----------79=_____

80. $1 + 0.2 + (0.2)^{2} + \frac{(0.2)^{4}}{8} - \frac{(0.2)^{5}}{15}$ ----------80=_____

2015-2016 TMSCA Middle School Calculator Test #4 Answer Key

Page 1

1 = -1080
= -1.08×10^{3}

2 = 37.0
= 3.70×10^{1}

3 = -1910
= -1.91×10^{3}

4 = -12.9
= -1.29×10^{1}

5 = 27.0
= 2.70×10^{1}

6 = -42.2
= -4.22×10^{1}

7 = -4.67
= -4.67×10^{0}

8 = 9.81
= 9.81×10^{0}

9 = 102000
= 1.02×10^{5}

10 = 3.44×10^{11}

11 = 220 INT.

12 = 254
= 2.54×10^{2}

13 = 50.9
= 5.09×10^{1}

Page 2

14 = -188
= -1.88×10^{2}

15 = -97.3
= -9.73×10^{1}

16 = 22.4
= 2.24×10^{1}

17 = 0.331
= 3.31×10^{-1}

18 = 410
= 4.10×10^{2}

19 = 10.8
= 1.08×10^{1}

20 = 0.295
= 2.95×10^{-1}

21 = 0.662
= 6.62×10^{-1}

22 = 0.759
= 7.59×10^{-1}

23 = -0.754
= -7.54×10^{-1}

24 = 5.54
= 5.54×10^{0}

25 = 309032 INT.

26 = 29.7
= 2.97×10^{1}

Page 3

27 = 1.40×10^{-12}

28 = -3020
= -3.02×10^{3}

29 = 9.74×10^{-11}

30 = -0.127
= -1.27×10^{-1}

31 = 1.02×10^{9}

32 = -3.77
= -3.77×10^{0}

33 = 1.11×10^{6}

34 = 0.0173
= 1.73×10^{-2}

35 = 0.917
= 9.17×10^{-1}

36 = 26 INT.

37 = 9.50×10^{-9}

38 = 17.4
= 1.74×10^{1}

Page 4

39 = -4.03×10^{16}

40 = 7.60×10^{8}

41 = 2.26
= 2.26×10^{0}

42 = 1.17
= 1.17×10^{0}

43 = -0.900
= -9.00×10^{-1}

44 = 1.11×10^{12}

45 = 1970
= 1.97×10^{3}

46 = 2500
= 2.50×10^{3}

47 = 4.38
= 4.38×10^{0}

48 = 48.0
= 4.80×10^{1}

49 = 37.9
= 3.79×10^{1}

50 = 0.0109
= 1.09×10^{-2}

2015-2016 TMSCA Middle School Calculator Test #4 Answer Key

Page 5

51 = 195
= 1.95×10^{2}

52 = 1.80×10^{8}

53 = 7.63×10^{8}

54 = -33700
= -3.37×10^{4}

55 = -0.0375
= -3.75×10^{-2}

56 = 77500
= 7.75×10^{4}

57 = 34.9
= 3.49×10^{1}

58 = 0.427
= 4.27×10^{-1}

59 = 0.0116
= 1.16×10^{-2}

60 = 0.00781
= 7.81×10^{-3}

Page 6

61 = 52.7
= 5.27×10^{1}

62 = 231
= 2.31×10^{2}

63 = 4.13×10^{7}

64 = 0.00425
= 4.25×10^{-3}

65 = 4.51×10^{27}

66 = -36.3
= -3.63×10^{1}

67 = -0.970
= -9.70×10^{-1}

68 = 0.357
= 3.57×10^{-1}

69 = -0.00179
= -1.79×10^{-3}

70 = 1.06
= 1.06×10^{0}

71 = $7081.44

72 = 452
= 4.52×10^{2}

Page 7

73 = 60.2
= 6.02×10^{1}

74 = 5.79×10^{10}

75 = 0.0335
= 3.35×10^{-2}

76 = 0.317
= 3.17×10^{-1}

77 = -0.00436
= -4.36×10^{-3}

78 = 2.22
= 2.22×10^{0}

79 = 233000
= 2.33×10^{5}

80 = 1.24
= 1.24×10^{0}

TMSCA 15-16 MS CA Test #4 Solutions to Word and Geometry Problems

11. 80(5) – 9(20)

12. On RPN calculator 560 right shift 4. This key changes pounds to kg.

13. 8x + 5x + 6x = 121

19x = 121

$$x = \frac{121}{19}$$

Longest side is $8(\frac{121}{19})$

24. $1 \div \left\{\left(\frac{1}{4} + \frac{1}{9}\right) \div 2\right\}$

25. $\frac{7}{8}x = 270{,}403$

$$x = 270{,}403\ \left(\frac{8}{7}\right)$$

26. Side of a square = diagonal ÷ $\sqrt{2}$. Perimeter is

$$4\left(\frac{125.9}{\sqrt{2}}\right)$$

35. For two workers only use this formula:

(product of times) ÷ (sum of times) $\frac{2.75\ (2.75 \div 2)}{2.75 + (2.75 \div 2)}$

36. D = 3Q and

10D + 25Q = 1430

Substitute 3Q for D

10(3Q) + 25Q = 1430

55Q = 1430 so Q = 1430/55

37. $\frac{\pi r^2}{4} = \frac{\pi\ (.00011)^2}{4}$

38. Side = $\frac{h}{\sqrt{3}}(2)$

Perimeter = $3\left(\frac{5.012}{\sqrt{3}}\ (2)\right)$

47. $x = short\ piece$

$$x + \frac{15}{12} = long\ piece$$

Total is $2x + \frac{15}{12} = 10$

$$x = \left(10 - \frac{15}{12}\right) \div 2$$

48. 60(t-1) = 40(t+1). Solve for t. t = 5. When t = 5, 60(t-1) = 40(t+1) = 240 miles. If the 240 mile trip should have taken 5 hours, the speed should have been 240 ÷ 5.

49. Use Pythagorean Theorem to find long leg.

$leg = \sqrt{16.18^2 - 7.21^2}$

Perimeter = $\sqrt{16.18^2 - 7.21^2}$ + 7.21 + 16.18

50. $\frac{cos\ 43}{1} = \frac{.008}{x}$

$$x = .008 \div (\cos 43)$$

59. $V = \frac{1}{3}\pi r^2 h$

$$2821 = \frac{1}{3}\pi(481)^2 h$$

$$h = \frac{2821\ (3)}{(481)^2\pi}$$

60. $\left(\frac{1}{2}\right)^7$

61. $V = \frac{1}{3}$Bh =

$\frac{1}{3}\ (7.211)(5.211)(4.211$

62. $\frac{14^2\pi}{2} - \frac{7^2\pi}{2}$

71. $I = P(1+r)^n - P$

$10{,}000(1 + .055)^{10} - 10{,}000$

72. Complete circumference is 2πr = 2(277.5)π

Arc is $93\frac{22}{60} \div 360$ of this.

Arc = $\frac{93\frac{22}{60}}{360}\ (277.5\ (2)\pi)$

73. $\frac{\sin 108}{108} = \frac{sin\ 32}{x}$

$$x = \frac{108\ (\sin 32)}{\sin 108}$$

74. V = Bh

B is an ellipse with area

$$\left(\frac{5275}{2}\right)\left(\frac{2861}{2}\right)\pi$$

V =

$$\left(\frac{5275}{2}\right)\left(\frac{2861}{2}\right)\pi\ (4888)$$