8

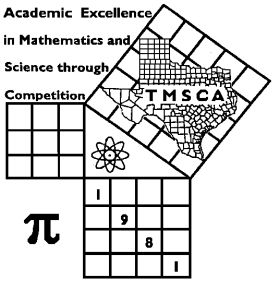
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #7©

JANUARY 16, 2016

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 #7

1. 257 + 785 ---------- 1=_____

2. 25 – 38 – 58 ---------- 2=_____

3. –128 + 123 + 42.8 ---------- 3=_____

4. 61 – 47 – 41 – 66 ---------- 4=_____

5. 3500 – 1140 – 2550 + 1920 ---------- 5=_____

6. –79.8 – 122 – 98.3 + 69.3 + 19.4 ---------- 6=_____

7. $(\pi - 0.661) + (5.44 - 1.66 - 5.28)$ ---------- 7=_____

8. 1.26 – 2.59 + 2.56 – 1.34 – 0.565 ---------- 8=_____

9. 736 x 62.4 x 472 ---------- 9=_____

10. 134 x 392 x 28.7 x 6260 ----------10=_____

11. At the end of 2009, the national debt was an estimated $\$1.23 \times 10^{13}$. The population at this time was an estimated 3.09×10^{8}. Using these estimates, calculate the per person share of the national debt. ----------11=$_____

12. The circumference of a circle is 5415 meters. Calculate the area of the circle in square meters. ----------12=_____m^2

13. Phils shadow is four feet three inches long. Nathans shadow is twenty-eight inches long. If Phil is six feet five inches tall, how tall is Nathan in feet? ----------13=_____ft.

14. $(-53/159)[136 - 185]$ ----------14=_____

15. $(404)[146 \times 338/315]$ ----------15=_____

16. $\{(253)(916 - 636)(774)\} - 5.04 \times 10^{7}$ ----------16=_____

17. $\{302/309\}\left[\frac{336}{352 + 114}\right]$ ----------17=_____

18. $\left[\frac{(1140/488) - (797/1220)}{235/166}\right]$ ----------18=_____

19. $\left[\frac{61/507}{155/493}\right]\{10.1 + 9.4 - 13.2\}$ ----------19=_____

20. $\frac{65}{(254 - 264)} - \frac{(238 - 385)}{45}$ ----------20=_____

21. $\frac{2.71 \times 10^{-4} + 2.51 \times 10^{-4} + 3.43 \times 10^{-4}}{(0.296)(3.16 \times 10^{-5})(0.107)}$ ----------21=_____

22. $\frac{(467 \times 496)/2670}{(3320 \times 0.0335) + 22.7}$ ----------22=_____

23. $\frac{(\pi)(149/30)(62/154)}{(91/191)}$ ----------23=_____

24. Calculate the mode of the first ten numbers in the Fibonacci sequence. ----------24=_____INT.

25. How many seconds are there in nine-sixteenths of a day? ----------25=_____sec.

26. Sam has a base salary of $450 per week, plus 5¼% commission on his sales. In eight weeks, his total sales were $87521.85. Calculate his total income for those eight weeks. ----------26=$_____

27. $\dfrac{(15.4 - 81.7)(0.35 + 0.539)}{(3.01\text{x}10^{11})}$ ----------27=_____

28. $(0.0933)[(109/25.7)(0.00214 + 0.00361)]$ ----------28=_____

29. $[950 - (314 + 885)] + [(0.127)(482 - 969)]$ ----------29=_____

30. $(9.7)\left[(7.78\text{x}10^{6}) - (1.19\text{x}10^{7})\right]$ ----------30=_____

31. $[20.9]\left[\dfrac{1/2.48}{1/0.889}\right]$ ----------31=_____

32. $(0.582)\left[\dfrac{0.0105}{(3.87\text{x}10^{9})}\right]$ ----------32=_____

33. $\left[\dfrac{1/343}{1/260}\right][1.38\text{x}10^{6}]$ ----------33=_____

34. $\left[\dfrac{1/81}{1/79.3}\right] + [0.758]$ ----------34=_____

35. Chris drives 211 miles in 5.25 hours. Calculate his average speed in miles per hour. ----------35=_____mph.

36. The intensity of light received from a source varies inversely as the square of the distance from the source. If the light intensity is 8 foot candles at 21 feet, calculate the light intensity at 30 feet. ----------36=_____FC.

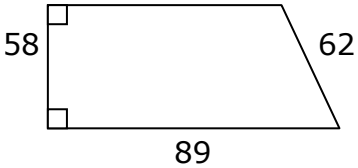
RECTANGLE

Area = 0.0000287

X = ?

37=_____

TRAPEZOID



Area = ?

38=_____

39. $(0.0222 + 0.118)^2(79.2 + 122)^2$ ----------39=_____

40. $\sqrt[4]{\frac{0.516 + 0.504}{178 - 64.8}}$ ----------40=_____

41. $\frac{(3930 + 13700)^2}{(0.102 - 0.0336)^3}$ ----------41=_____

42. $(1/(0.00129))(2660 - 1220)^2$ ----------42=_____

43. $(46.8)\sqrt{28.8 + 91.4 + 39.6}$ ----------43=_____

44. $\sqrt{(1030/1250) + 0.34 - 0.181}$ ----------44=_____

45. $\frac{(21.7 + 23.5)^{1/4}}{(26.8 - 23)^{1/4}}$ ----------45=_____

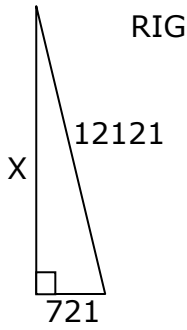
46. $(3480)\sqrt[4]{6230 + 15900 - 4540}$ ----------46=_____

47. On a number line, the line segment AB has a midpoint C located at -8.21. The coordinate of point A is 17.88. Calculate the coordinate of point B. ----------47=_____

48. Calculate the sum of the roots of the quadratic equation:

$-7 + 3x^2 - 5x = 0$ ----------48=_____

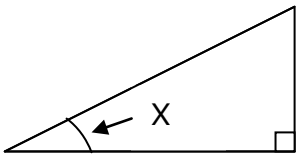
RIGHT TRIANGLE



X = ?

49=_____

RIGHT TRIANGLE



1.520

X = ? radians

50=_____

51. $\left[\frac{\sqrt{\sqrt{515 - 160}}}{-(76900 - 25500)}\right]^{3}[0.298 + 0.113]$ ----------51=_____

52. $\left[\frac{30.5 - 23.6 + \sqrt{351/9.14}}{-8.38 + 8.64}\right]^{-2}$ ----------52=_____

53. $\left[\frac{36.4 + 11.8 + \sqrt{683 + 1760}}{227/110}\right]^{3}$ ----------53=_____

54. $(27.4)(1.05\text{x}10^{7})^{1/4} - [(1490)(2920)]^{1/2}$ ----------54=_____

55. $\sqrt{\frac{1/(258 - 92.6)}{(111)(36.9 + 26.3)^{2}}}$ ----------55=_____

56. $7850 + \sqrt{(2380)(1740)} - (1610 + 8430)$ ----------56=_____

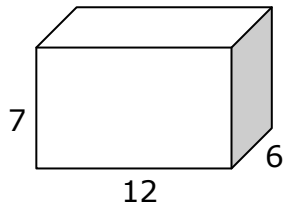
57. $\sqrt{\frac{1/(876 - 325)}{(3110)(30.1 + 29.9)^{-3}}}$ ----------57=_____

58. $\sqrt{\frac{(351)(1410)}{(738) + (1310)}} + 1/(0.0643)^{1}$ ----------58=_____

59. The volume of a pyramid is 314.16 cubic meters. The height of the pyramid is 21.8 meters. Calculate the area of the base of the pyramid in square meters. ----------59=_____m^2

60. A circular spinner is divided into 10 equal sections, each section containing one of the digits 0 – 9 inclusive. Calculate the probability of spinning and landing on a prime number. ----------60=_____

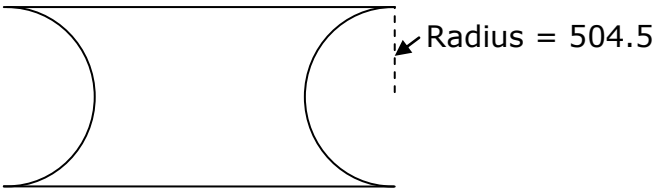
RECTANGULAR PRISM



Surface Area = ?

61=_____

RECTANGLE AND EQUIVALENT SEMICIRCLES



Area = ?

62=_____

63. $\frac{26!}{21!}$ ----------63=_____

64. $(53800 - 58200)^{-8}(99800)$ ----------64=_____

65. (deg) $\frac{\cos(11.4°)}{75.5}$ ----------65=_____

66. (rad) $\frac{\sin(3.62)}{117/317}$ ----------66=_____

67. (deg) $\cos(98° - 78.2°) + 0.882$ ----------67=_____

68. (rad) $\sin[(13 - 5.57)(1.16)]$ ----------68=_____

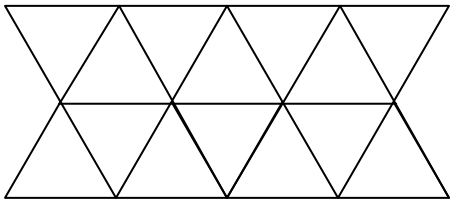
69. (deg) $\frac{\sin(0.951°) - \tan(0.951°)}{\sin(0.951°)}$ ----------69=_____

70. $\left[(7.56)\left(\frac{273}{(471)(\pi)}\right)\right]^{7/2}$ ----------70=_____

71. Calculate the seventy-third hexagonal number. ----------71=_____INT.

72. A 10 meter by 20 meter pool is surrounded by a deck of uniform width. The area of the deck is 400 feet squared. Calculate the width of the deck on feet. ----------72=_____ft.

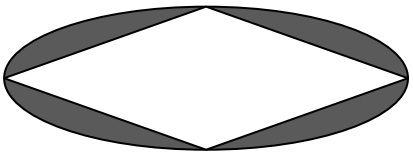
CONGRUENT EQUILATERAL TRIANGLES



Total Area = 90707 Perimeter = ?

73=_____

ELLIPSE AND RHOMBUS



Diagonal 1 = 0.0829
Diagonal 2 = 0.1795

Shaded Area = ?

74=_____

75. $\dfrac{6.3 + \sqrt{(2.79)(5.73)} + (0.967)(11.2)}{\sqrt{\sqrt{0.926 + \pi}}}$ ----------75=_____

76. $\text{Ln}\left[\dfrac{37.6 + 49.4 + 106}{109 + 130 - 63.3}\right]$ ----------76=_____

77. $(15900)10^{(0.974)(2.45)}$ ----------77=_____

78. $\text{Ln}\left[\dfrac{10.7 + 5.25 + 5.53}{50.4 - 5.66 - 4.75}\right]$ ----------78=_____

79. $1 + 3 + 5 + \ldots + 845$ ----------79=_____

80. $-\dfrac{1}{(6.6)} + \dfrac{1}{3(6.6)^3} - \dfrac{1}{5(6.6)^5} + \dfrac{1}{7(6.6)^7}$ ----------80=_____

2015-2016 TMSCA Middle School Calculator Test #7 Answer Key

Page 1

1 = 1040
= 1.04×10^{3}

2 = -71.0
= -7.10×10^{1}

3 = 37.8
= 3.78×10^{1}

4 = -93.0
= -9.30×10^{1}

5 = 1730
= 1.73×10^{3}

6 = -211
= -2.11×10^{2}

7 = 0.981
= 9.81×10^{-1}

8 = -0.675
= -6.75×10^{-1}

9 = 2.17×10^{7}

10 = 9.44×10^{9}

11 = $39805.83

12 = 2330000
= 2.33×10^{6}

13 = 3.52
= 3.52×10^{0}

Page 2

14 = 16.3
= 1.63×10^{1}

15 = 63300
= 6.33×10^{4}

16 = 4.43×10^{6}

17 = 0.705
= 7.05×10^{-1}

18 = 1.19
= 1.19×10^{0}

19 = 2.41
= 2.41×10^{0}

20 = -3.23
= -3.23×10^{0}

21 = 864
= 8.64×10^{2}

22 = 0.648
= 6.48×10^{-1}

23 = 13.2
= 1.32×10^{1}

24 = 1 INT.

25 = 48600
= 4.86×10^{4}

26 = $8194.90

Page 3

27 = -1.96×10^{-10}

28 = 0.00228
= 2.28×10^{-3}

29 = -311
= -3.11×10^{2}

30 = -4.00×10^{7}

31 = 7.49
= 7.49×10^{0}

32 = 1.58×10^{-12}

33 = 1.05×10^{6}

34 = 1.74
= 1.74×10^{0}

35 = 40.2
= 4.02×10^{1}

36 = 3.92
= 3.92×10^{0}

37 = 0.00350
= 3.50×10^{-3}

38 = 4520
= 4.52×10^{3}

Page 4

39 = 796
= 7.96×10^{2}

40 = 0.308
= 3.08×10^{-1}

41 = 9.71×10^{11}

42 = 1.61×10^{9}

43 = 592
= 5.92×10^{2}

44 = 0.991
= 9.91×10^{-1}

45 = 1.86
= 1.86×10^{0}

46 = 40100
= 4.01×10^{4}

47 = -34.3
= -3.43×10^{1}

48 = 1.67
= 1.67×10^{0}

49 = 12100
= 1.21×10^{4}

50 = 0.489
= 4.89×10^{-1}

2015-2016 TMSCA Middle School Calculator Test #7 Answer Key

Page 5

51 = -2.48×10^{-13}

52 = 0.000394
= 3.94×10^{-4}

53 = 106000
= 1.06×10^{5}

54 = -526
= -5.26×10^{2}

55 = 0.000117
= 1.17×10^{-4}

56 = -155
= -1.55×10^{2}

57 = 0.355
= 3.55×10^{-1}

58 = 31.1
= 3.11×10^{1}

59 = 43.2
= 4.32×10^{1}

60 = 0.400
= 4.00×10^{-1}

Page 6

61 = 396
= 3.96×10^{2}

62 = 1340000
= 1.34×10^{6}

63 = 7.89×10^{23}

64 = 7.10×10^{-25}

65 = 0.0130
= 1.30×10^{-2}

66 = -1.25
= -1.25×10^{0}

67 = 1.82
= 1.82×10^{0}

68 = 0.722
= 7.22×10^{-1}

69 = -0.000138
= -1.38×10^{-4}

70 = 3.20
= 3.20×10^{0}

71 = 10585 INT.

72 = 5.00
= 5.00×10^{0}

Page 7

73 = 1470
= 1.47×10^{3}

74 = 0.00425
= 4.25×10^{-3}

75 = 14.9
= 1.49×10^{1}

76 = 0.0939
= 9.39×10^{-2}

77 = 3.87×10^{6}

78 = -0.622
= -6.22×10^{-1}

79 = 179000
= 1.79×10^{5}

80 = -0.150
= -1.50×10^{-1}

TMSCA 15-16 MS CA Test #7 Solutions to Word and Geometry Problems

11. $\frac{1.23\ x\ 10^{13}}{3.09\ x\ 10^{8}}$

12. $C = 2\pi r$ so $r = \frac{C}{2\pi}$

$A = \pi r^2$ so A = $\pi\left(\frac{C}{2\pi}\right)^2$

Area: $\pi\left(\frac{5415}{2\pi}\right)^2$

13. $\frac{77}{51} = \frac{x}{28}$ (Using inches)

$x = \frac{77(28)}{51}$ Divide by 12 to change to feet.

24. The only two numbers in Fibonacci sequence that are the same are the first two 1's. Sequence: 1,1,2,3,5,8,13,21…

25. $24(60)(60)\left(\frac{9}{16}\right)$

26.

$450(8) + .0525(87521.85)$

SHOW to see exact amount.

35. 211 ÷ 5.25

36.

$(i_1)([d_1]^2) = (i_2)([d_2]^2)$

$8(21^2) = x(30^2)$

$$x = \frac{8(21^2)}{30^2}$$

37. $x = \frac{.0000287}{.0082}$

38. $A = \frac{58\ (67+89)}{2}$

47. Distance from C to A = 17.88 + 8.21 = 26.09

B = $-\ 8.21 - 26.09$

48. Sum of the roots = $-\ \frac{b}{a}$ in $ax^2 + bx + c = 0$

$3x^2 - 5x - 7 = 0$

Sum of roots: $-\ \frac{-5}{3} = \frac{5}{3}$

49. $\sqrt{12121^2 - 721^2}$

50. Change calculator to radians.

$$\tan x = \frac{.808}{1.52}$$

On RPN: $\frac{.808}{1.52}$ followed by ATAN

59. $V = \frac{1}{3}Bh$ so $B = \frac{3V}{h}$

$$\frac{3(314.16)}{21.8}$$

60. Primes: 2,3,5,7

Probability: $\frac{4}{10}$

61. $SA = Ph + 2B$

$(12 + 6 + 12 + 6)7 + 12(6)(2)$

62. Rectangle: 2118(504.5)2

Circle: $A = \pi(504.5)^2$

Area: 2118(504.5)2 - $\pi(504.5)^2$

71. Hexagonal number:

$n(2n - 1)$

$73[(2)(73) - 1]$

SHOW to see all the digits.

72. x = width of deck. Length of surrounded pool is (20 + 2x). Width of surrounded pool is (10 + 2x). Area of surrounded pool minus area of pool = area of deck.

$$(20 + 2x)(10 + 2x) - 10(20) = 400$$

$$200 + 60x + 4x^2 - 200 = 400$$

$$4x^2 + 60x - 400 = 0$$

$$4(x^2 + 15x - 100) = 0$$

$$4(x + 20)(x - 5) = 0$$

$$x = 5.00$$

73. There are 14 triangles.

Area of one = $\frac{90707}{14}$

Area of equilateral triangle:

$\frac{s^2\sqrt{3}}{4} = \frac{90707}{14}$

Side: $\sqrt{\left(\frac{90707}{14}\right)\left(\frac{4}{\sqrt{3}}\right)}$

12 segments in perimeter:

$$12\left(\sqrt{\left(\frac{90707}{14}\right)\left(\frac{4}{\sqrt{3}}\right)}\right)$$

74. Area of ellipse:

$$\pi\left(\frac{.0829}{2}\right)\left(\frac{.1795}{2}\right)$$

Area of rhombus:

$$(d_1)(d_2) \div 2$$

$$(.0829)(.1795) \div 2$$

Shaded area:

$$\pi\left(\frac{.0829}{2}\right)\left(\frac{.1795}{2}\right) - (.0829)(.1795) \div 2$$