8

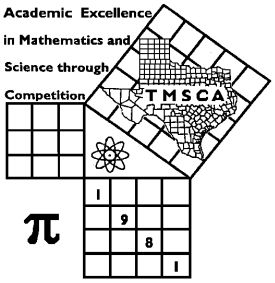
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 11, 2017

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.

2017-2018 TMSCA Middle School Calculator Test 4

1. $-2090 + 3020$ ---------- 1=_____

2. $42 - 12 + 42$ ---------- 2=_____

3. $658 + 442 - 499$ ---------- 3=_____

4. $21 - 39 + 61 - 53$ ---------- 4=_____

5. $1160 + 292 - 827 - 1020$ ---------- 5=_____

6. $144 + 29.9 - 78.4 - 186 + 44.7$ ---------- 6=_____

7. $-2.83 + 4.2 + 3.26 + 0.932 + 2.48$ ---------- 7=_____

8. $(1.1 - 0.745) + (\pi - 1.45 - 1.51)$ ---------- 8=_____

9. $144 \times 63.7 \times 142$ ---------- 9=_____

10. $1870 \times 2200 \times 2640 \times 1270$ ---------- 10=_____

11. My car gets an average of 32 mpg. If I buy $20 in gas at $2.399 per gallon, calculate how far I can go in miles. ---------- 11=_____mi.

12. The sum of three consecutive integers is 72. Calculate the smallest integer. ---------- 12=_____INT.

13. Calculate the geometric mean of the largest prime number less than 100 and the smallest palindrome greater than 100. -------- 13=_____

14. $(267/386)[82 - 113]$ ---------- 14=_____

15. $370/[326 \times 286 \times 88]$ ---------- 15=_____

16. $\{329/345\}\left[\frac{356}{218 + 394}\right]$ ---------- 16=_____

17. $\left[\frac{830}{142}\right][(771/194) + 2.29]$ ---------- 17=_____

18. $\left[\frac{(0.0638 + 0.167)}{131/154}\right]\left[\frac{15.4}{0.299}\right]$ ---------- 18=_____

19. $\frac{(206/134) + (154/376)}{(570 - 343)}$ ---------- 19=_____

20. $\frac{(0.0104)(0.13)}{197}(690 - 882)$ ---------- 20=_____

21. $(1.66)[93/82 \times 87/78] - 1.8$ ---------- 21=_____

22. $\frac{(\pi + 5.11 - 4.46)}{\{(0.0216 - 0.0198)/(18.2)\}}$ ---------- 22=_____

23. $\frac{(\pi)(859/486)(322/832)}{(215/707)}$ ---------- 23=_____

24. Calculate the positive difference between 3.723 and its reciprocal. 24=_____

25. Six years ago, Teri's age was one-fourth of the age she will be in 12 years. Calculate her age now. ---------- 25=_____INT.

26. Charlie collects all of his spare change in a jar. He sorted it out on Friday. He had 62 quarters, 21 dimes, 37 nickels, and 171 pennies. Calculate the value of the coins. ---------- 26=$_____

27. $(0.0066)\left[(5.80\text{x}10^{-4}/0.00133)(61.6 + 106)\right]$ ---------- 27=_____

28. $(0.00939)\left[(7.04\text{x}10^{-4}/0.00142)(0.612/2.49)\right]$ ---------- 28=_____

29. $\dfrac{(5.33 - 10.4)(97.8 + 87.7)}{(1.38\text{x}10^{12})}$ ---------- 29=_____

30. $\dfrac{1}{-0.703} + \dfrac{1}{(\pi)(2.91 - 3.18)}$ ---------- 30=_____

31. $\dfrac{1}{-14.2} + \dfrac{1}{(110 - 142)}$ ---------- 31=_____

32. $(0.0284)\left[\dfrac{0.00336}{(9.95\text{x}10^{7})}\right]$ ---------- 32=_____

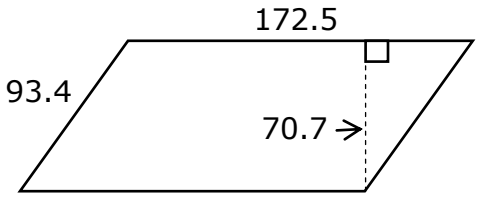
33. $\left[\dfrac{1/276}{1/266}\right] + [0.735]$ ---------- 33=_____

34. $\dfrac{1}{51} - \dfrac{1}{34.1} + \dfrac{1}{148}$ ---------- 34=_____

35. Bill can do all of the lawn work in 1 hour and 30 minutes. Bob can do the same work in 2 hours and 15 minutes. Calculate how long it will take them to do the lawn work together. ---------- 35=_____hrs.

36. Lauren leaves the apartment headed south at 57 mph. Lily leaves at the same time headed north at 64 mph. Calculate how long it will take for them to be 250 miles apart. ---------- 36=_____hrs.

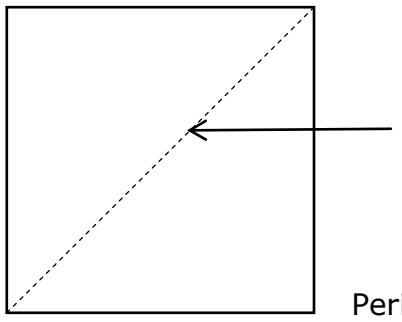
PARALLELOGRAM



Area = ?

37=_____

SQUARE



Perimeter = ?

38=_____

39. $\sqrt{\dfrac{5.01 + 4.94}{0.922 - 0.499}}$ ---------- 39=_____

40. $\dfrac{(27600 + 14000)^2}{(0.0307 - 0.062)^3}$ ---------- 40=_____

41. $(10.2 + 1.74)^2(34.2 + 66.8)^2$ ---------- 41=_____

42. $(1/(0.0292))(5.97\text{x}10^5 - 5.68\text{x}10^5)^3$ ---------- 42=_____

43. $\sqrt{6460 - 5770 + 2230} - \sqrt{8560}$ ---------- 43=_____

44. $\sqrt{(56.4/49) + 1.08 - 0.382}$ ---------- 44=_____

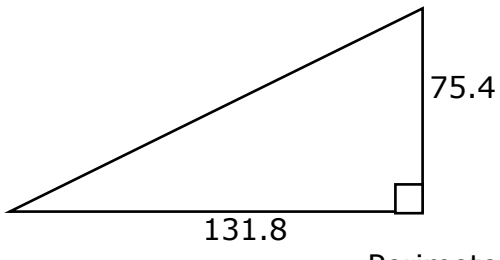
45. $\dfrac{1}{\sqrt{368 + 844 + 751}} + \left(\dfrac{1}{\sqrt{10.8}}\right)^3$ ---------- 45=_____

46. $\dfrac{(6890 + 5710)^{1/4}}{(98.2 - 21.7)^{1/4}}$ ---------- 46=_____

47. Calculate $(-927)^{921}$. ---------- 47=_____

48. A floor is being covered with 9 inch square tiles. If the floor measures 4 feet by 6 feet, calculate the number of tiles needed to cover the floor. ---------- 48=_____tiles

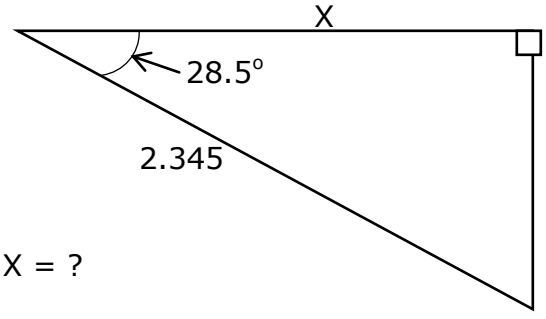
RIGHT TRIANGLE



Perimeter = ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\left[\frac{298 + 128 + \sqrt{50300 + 44100}}{49.4/13.5}\right]^2$ ---------- 51=_____

52. $\left[\frac{\sqrt{\sqrt{2.26\text{x}10^5 - 1.54\text{x}10^5}}}{-(62200 - 33100)}\right]^2 [3.39\text{x}10^5 + 4.75\text{x}10^5]$ ----- 52=_____

53. $\sqrt{\frac{9.56\text{x}10^{-15}}{(1.75)(0.274)}} + \frac{(0.25 - 0.295)}{(1.49\text{x}10^5 + 1.61\text{x}10^5)}$ ---------- 53=_____

54. $(16.9)(1.89\text{x}10^8)^{1/2} - [(5.97\text{x}10^7)(7.79\text{x}10^8)]^{1/3}$ ------ 54=_____

55. $(30.4)^2 \sqrt{(3.19)/(134)} - (136 + 30.9)$ ---------- 55=_____

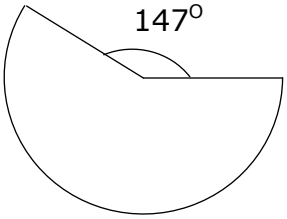
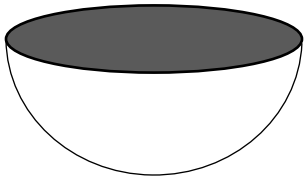
56. $\sqrt{\frac{1/(26.2 - 15.6)}{(185)(76.5 + 62.1)^5}}$ ---------- 56=_____

57. $\sqrt{\frac{1/(1790 - 801)}{(97.7)(104 + 436)^{-5}}}$ ---------- 57=_____

58. $\sqrt{\frac{(123)(6220)}{(1310) + (2120)}} - 30.3$ ---------- 58=_____

59. Calculate how many liters of water must be added to 80 liters of an 80% acid solution to produce a 25% acid solution. ---------- 59=_____l

60. Calculate the number of distinct diagonals in a polygon with 2017 sides. ---------- 60=_____INT.

SECTOR OF A CIRCLE	HEMISHERE
Radius = 591  Area of enclosed sector = ? 61=_____	 Diameter = 0.00021 Surface Area = ? 62=_____

63. $\frac{34!}{32!} + 5!$ ---------- 63=_____

64. $(105 - \pi)e^{0.44}$ ---------- 64=_____

65. $(1.50x10^{5} - 29700)^{-6}(1.61x10^{7})$ ---------- 65=_____

66. (deg) $\sin(193° - 196°) + 0.0177$ ---------- 66=_____

67. (deg) $(684 - 685)\sin(14.3°) + 0.182$ ---------- 67=_____

68. (deg) $\frac{\sin(18.6°)}{\tan(18.6°)}[177]$ ---------- 68=_____

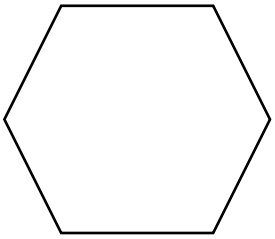
69. (deg) $\frac{\sin(11.9°)}{150 + 252}$ ---------- 69=_____

70. $(7540 - 7450)^{0.364 - 0.384}$ ---------- 70=_____

71. On a license plate there will be 4 letters, A thru Z, followed by 3 numbers, 0 thru 9. Calculate the number of license plates that can be made if repetition is allowed. ---------- 71=_____

72. If the probability of an event happening is 17/25, calculate the odds of that event happening. ---------- 72=_____

REGULAR HEXAGON

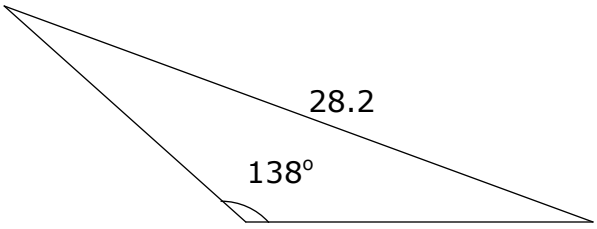


Edge = 1115

Area = ?

73=_____

SCALENE TRIANGLE



Perimeter = ?

74=_____

75. $\dfrac{(1.33)^{0.268}(45.2)^{0.138}}{(12.8 - 12.3)^{-10}}$ ---------- 75=_____

76. $\text{Ln}\left[\dfrac{83.4 + 514 + 153}{188 + 659 - 613}\right]$ ---------- 76=_____

77. $\text{Log}\sqrt{\dfrac{139 - 47.4}{(27.4)(380)}}$ ---------- 77=_____

78. $(76.9)^{\pi}(13.4)^{2}(74.8 - 34.3)^{3}$ ---------- 78=_____

79. $4 + 6 + 8 + \ldots + 232$ ---------- 79=_____

80. $(0.66) - \dfrac{(0.66)^2}{2} + \dfrac{(0.66)^3}{3} - \dfrac{(0.66)^4}{4}$ ---------- 80=_____

2017-2018 TMSCA Middle School Calculator Test 4 Answer Key

Page 1

1 = 930
= 9.30×10^{2}

2 = 72.0
= 7.20×10^{1}

3 = 601
= 6.01×10^{2}

4 = -10.0
= -1.00×10^{1}

5 = -395
= -3.95×10^{2}

6 = -45.8
= -4.58×10^{1}

7 = 8.04
= 8.04×10^{0}

8 = 0.537
= 5.37×10^{-1}

9 = 1.30×10^{6}

10 = 1.38×10^{13}

11 = 267
= 2.67×10^{2}

12 = 23 INT.

13 = 99.0
= 9.90×10^{1}

Page 2

14 = -21.4
= -2.14×10^{1}

15 = 4.51×10^{-5}

16 = 0.555
= 5.55×10^{-1}

17 = 36.6
= 3.66×10^{1}

18 = 14.0
= 1.40×10^{1}

19 = 0.00858
= 8.58×10^{-3}

20 = -0.00132
= -1.32×10^{-3}

21 = 0.300
= 3.00×10^{-1}

22 = 38300
= 3.83×10^{4}

23 = 7.07
= 7.07×10^{0}

24 = 3.45
= 3.45×10^{0}

25 = 12 INT.

26 = $21.16

Page 3

27 = 0.482
= 4.82×10^{-1}

28 = 0.00114
= 1.14×10^{-3}

29 = -6.82×10^{-10}

30 = -2.60
= -2.60×10^{0}

31 = -0.102
= -1.02×10^{-1}

32 = 9.59×10^{-13}

33 = 1.70
= 1.70×10^{0}

34 = -0.00296
= -2.96×10^{-3}

35 = 0.900
= 9.00×10^{-1}

36 = 2.07
= 2.07×10^{0}

37 = 12200
= 1.22×10^{4}

38 = 7.83
= 7.83×10^{0}

Page 4

39 = 4.85
= 4.85×10^{0}

40 = -5.64×10^{13}

41 = 1.45×10^{6}

42 = 8.35×10^{14}

43 = -38.5
= -3.85×10^{1}

44 = 1.36
= 1.36×10^{0}

45 = 0.0507
= 5.07×10^{-2}

46 = 3.58
= 3.58×10^{0}

47 = -4.79×10^{2732}

48 = 42.7
= 4.27×10^{1}

49 = 359
= 3.59×10^{2}

50 = 2.06
= 2.06×10^{0}

2017-2018 TMSCA Middle School Calculator Test 4 Answer Key

Page 5

51 = 40200
$= 4.02 \times 10^{4}$

52 = 0.258
$= 2.58 \times 10^{-1}$

53 = -3.96×10^{-9}

54 = -127000
$= -1.27 \times 10^{5}$

55 = -24.3
$= -2.43 \times 10^{1}$

56 = 9.99×10^{-8}

57 = 21800
$= 2.18 \times 10^{4}$

58 = -15.4
$= -1.54 \times 10^{1}$

59 = 176
$= 1.76 \times 10^{2}$

60 = 2031119 INT.

Page 6

61 = 649000
$= 6.49 \times 10^{5}$

62 = 1.04×10^{-7}

63 = 1240
$= 1.24 \times 10^{3}$

64 = 158
$= 1.58 \times 10^{2}$

65 = 5.31×10^{-24}

66 = -0.0346
$= -3.46 \times 10^{-2}$

67 = -0.0650
$= -6.50 \times 10^{-2}$

68 = 168
$= 1.68 \times 10^{2}$

69 = 0.000513
$= 5.13 \times 10^{-4}$

70 = 0.914
$= 9.14 \times 10^{-1}$

71 = 4.57×10^{8}

72 = 2.13
$= 2.13 \times 10^{0}$

Page 7

73 = 3230000
$= 3.23 \times 10^{6}$

74 = 58.3
$= 5.83 \times 10^{1}$

75 = 0.00178
$= 1.78 \times 10^{-3}$

76 = 1.17
$= 1.17 \times 10^{0}$

77 = -1.03
$= -1.03 \times 10^{0}$

78 = 1.00×10^{13}

79 = 13600
$= 1.36 \times 10^{4}$

80 = 0.491
$= 4.91 \times 10^{-1}$

TMSCA 2017-2018 MS CA Test 4 Solutions to Word and Geometry Problems

11.

$$\frac{20}{2.399} = gallons$$

$$\frac{32\ miles}{1\ gal} = \frac{x}{\frac{20}{2.399}}$$

$$x = (32)\left(\frac{20}{2.399}\right)$$

12. $x + x + 1 + x + 2 = 72$

$3x + 3 = 72;\ 3x = 69$

$x = 23$

13. $\sqrt{(97)(101)}$

24. $3.723 - \frac{1}{3.723}$

25. Teri now = x

Teri 6 years ago = x – 6

Teri in 12 years = x + 12

$$x - 6 = \frac{1}{4}(x + 12)$$

$$x - 6 = \frac{1}{4}x + 3$$

$$\frac{3}{4}x = 9; x = 12$$

26.

62(.25) + 21(.1) + 37(.05)+ 1.71

35. Shortcut to work problems for 2 people:

$$\frac{ab}{a+b} = \frac{(1.5)(2.25)}{1.5 + 2.25}$$

36. rate x time = distance

Lauren: d = 57t

Lily: d = 64t

57t + 64t = 250;

$$t = \frac{250}{57 + 64}$$

37. A = bh = (172.5)(70.7)

38. diagonal = 2.7675

Side of square = $\frac{2.7675}{\sqrt{2}}$

so Perimeter = $4\left(\frac{2.7675}{\sqrt{2}}\right)$

47. **$(-927)^{921}$:**

921 [ENTER] 927 [LOG] [x]

[SHOW] *(Look at the digits to the left of the decimal. This gives 2732 for the exponent. Write down 2732.)*

2732 [–] [10^x]

(This gives 4.79 E0 which is the first part of your answer.

The answer is -4.79×10^{2732}*). The answer is negative because a negative raised to an odd power is negative.*

48. 4 ft x 6 ft = 24 ft.^{2} = 24(144) in^2. Each tile is 9^2 = 81 in.^{2}

$$\frac{(24)(144)}{81}$$

49.

$$hypotenuse = \sqrt{131.8^2 + 75.4^2}$$

Add all three sides.

50.

$$\frac{cos\ 28.5}{1} = \frac{x}{2.345}$$

$$x = (2.345)(cos\ 28.5)$$

59. 80(.8) + 0x = .25(80+x)

64 + 0 = 20 + .25x; $x = \frac{44}{.25}$

60. INT problem. See all digits.

$$\#\ of\ diagonals = \frac{(n)(n-3)}{2} = \frac{(2017)(2014)}{2}$$

61. Central angle inside the sector = 360 – 147 = 213^0

$$Area\ of\ sector = \frac{213}{360}(591)^2\pi$$

62. $surface\ area\ of\ hemisphere = 3\pi r^2$

$= 3\pi\left(\frac{.00021}{2}\right)^2$

71. $26^4\ x\ 10^3$

72.

$$\frac{17\ ways\ it\ can\ happen}{8\ ways\ it\ can't\ happen}$$

73. Hexagon = 6 equilateral triangles. One equilateral triangle

$$\frac{1115^2\sqrt{3}}{4}$$

Hexagon area:

$$6\left(\frac{1115^2\sqrt{3}}{4}\right)$$

74. Use law of sines twice. First use it to find the angle on upper left.

$$\frac{sin\ 138}{28.2} = \frac{sinx}{17.5}\ so$$

$$x = asin\left(\frac{17.5(sin138)}{28.2}\right)$$

This angle is ≈24.53

Third angle ≈

180 – 24.53- 138 ≈ 17.5

$\frac{sin138}{28.2} = \frac{\sin 17.5}{x}\ where\ x = missing\ side.$

Add all three sides for perimeter.