8

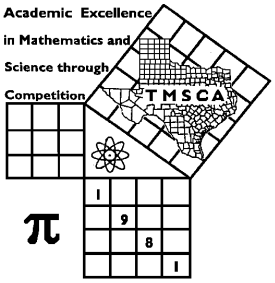
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #2©

OCTOBER 31, 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.

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2015-2016 TMSCA Middle School Calculator Test #2

1. 8.91 + 16.2 ---------- 1=_____

2. 44 + 35 + 50 ---------- 2=_____

3. 105 + 314 + 338 ---------- 3=_____

4. π + 10 – 3 – 1 ---------- 4=_____

5. –631 – 303 – 797 – 456 ---------- 5=_____

6. 51.1 + 50.4 – 79.6 – 75.3 – 16.2 ---------- 6=_____

7. 1.74 + 2.59 – 3.3 + π + 4.07 ---------- 7=_____

8. (0.85 – 0.369) + (1.62 – 1.38 – 0.915) ---------- 8=_____

9. 359 x 109 x 99.3 ---------- 9=_____

10. 1680 x 127 x 1920 x 62.5 ----------10=_____

11. Ed made an online purchase of $192.75, including tax and shipping charges. If the tax was $8.71 and the shipping charges were $19.26, calculate the cost of the items themselves. ----------11=$_____

12. Calculate the Least Common Multiple of 45, 60, and 75. ----------12=_____INT.

13. Calculate the number of gallons in six two-liter bottles.----------13=_____gal.

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14. $287 - [523/247 + 2.7]$ ----------14=_____

15. $(428)[186 \times 210/259]$ ----------15=_____

16. $(32 + 62)[41 - 27 - 61]$ ----------16=_____

17. $\{118/37\}\left[\frac{116}{107 + 51}\right]$ ----------17=_____

18. $\left[\frac{(723/396) - (511/504)}{0.822/0.777}\right]$ ----------18=_____

19. $\frac{[0.00252/(0.00322)]/282}{(27.1 \times 18)(0.181)}$ ----------19=_____

20. $\frac{187}{(64 - 116)} - \frac{(108 - 24)}{48}$ ----------20=_____

21. $\frac{558 + 432 + 395}{(0.00346)(0.00963)(4.56 \times 10^{-5})}$ ----------21=_____

22. $\left[\frac{534 + 2150}{913 - 294}\right]\left[\frac{905}{2250}\right]$ ----------22=_____

23. $\frac{(\pi)(232/214)(88/251)}{(258/94)}$ ----------23=_____

24. The geometric mean of a group of numbers, n, is the nth root of their product. Calculate the geometric mean of 27 and pi. ----------24=_____

25. If a race car is traveling at 208 miles per hour, how many miles will it travel in one minute?----------25=_____mi.

26. Fran sold eleven more fund raising items than Ted. If together they sold a total of 59 items, calculate the number of items Ted sold.---------26=_____INT.

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27. $\dfrac{(1.69\text{x}10^{6}) + (1.36\text{x}10^{6})}{(-0.013)(0.0281) - 3.60\text{x}10^{-4}}$ ----------27=_____

28. $\dfrac{(3.99 + 2.62)(62.7 + 15.5)}{(4.62\text{x}10^{11})}$ ----------28=_____

29. $\dfrac{(1.63 - \pi)(0.279 + 0.102)}{(1.34\text{x}10^{11})}$ ----------29=_____

30. $(8.50\text{x}10^{-4})\left[\dfrac{0.0917}{(2.73\text{x}10^{11})}\right]$ ----------30=_____

31. $\dfrac{1}{-619} + \dfrac{1}{(\pi)(128 - 342)}$ ----------31=_____

32. $\dfrac{1}{379} + \dfrac{1}{(311 - 140)}$ ----------32=_____

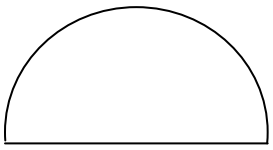
33. $\left[\dfrac{1/646}{1/711}\right] + [0.741]$ ----------33=_____

34. $\left[\dfrac{1/2060}{1/856}\right][9.67\text{x}10^{5}]$ ----------34=_____

35. Marco drives 787 miles at an average speed of 53 mph. Calculate how long it will take him to drive that distance. ----------35=_____hrs.

36. A stone is dropped from the top of a cliff. The distance it falls is proportional to the square of the time it falls. If the stone falls 17.8 feet in 3 seconds, calculate how far it will fall after 8 seconds. ----------36=_____ft.

SEMICIRCLE

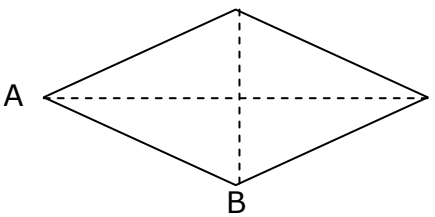


Radius = 28.72

Perimeter = ?

37=_____

RHOMBUS



AD = 0.00185
BC = 0.00092

Area = ?

38=_____

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39. $(900 + 727 + 403)^2(0.128 + 0.0405)^2$ ----------39=_____

40. $\dfrac{(17500 + 11500)^3}{(0.07 - 0.0173)^2}$ ----------40=_____

41. $\sqrt[3]{\dfrac{243 + 871}{0.866 - 0.579}}$ ----------41=_____

42. $(194)\sqrt{254 + 32.8 + 98.6}$ ----------42=_____

43. $\sqrt{887 - 374 + 1010} - \sqrt{217}$ ----------43=_____

44. $\sqrt{(1590/2190) + 0.234 - 0.105}$ ----------44=_____

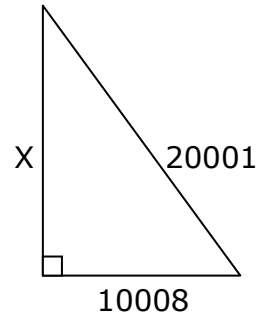
45. $(8130)\sqrt[3]{403 + 444 - 298}$ ----------45=_____

46. $\dfrac{(36900 + 12000)^{1/2}}{(38300 - 31600)^{1/4}}$ ----------46=_____

47. Stewart drove 150 miles at 50 mph and then drove 240 miles at 60 mph. Calculate his average speed for the entire trip. ----------47=_____mph

48. Calculate the discriminate of the quadratic equation $2x - 3x^2 = 7$. 48=_____

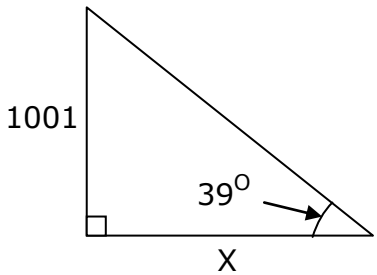
RIGHT TRIANGLE



X = ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

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51. $\left[\frac{\sqrt{\sqrt{186 - 156}}}{-(5.39 - 1.91)}\right]^3 [1.42 + 1.74]$ ----------51=_____

52. $\frac{(0.295 + 0.59 - 0.407)^3}{\sqrt{699 + 1550 + 681}}$ ----------52=_____

53. $\left[\frac{498 + 114 + \sqrt{3.03x10^5 + 57100}}{11000/6270}\right]^3$ ----------53=_____

54. $6950 + \sqrt{(7970)(3400)} - (4830 + 6520)$ ----------54=_____

55. $\sqrt{\frac{1/(10.5 - 7.94)}{(7.03)(38.8 + 29.6)^5}}$ ----------55=_____

56. $(5.39)^2 \sqrt{(34.5)/(4.55)} - (66.8 + 46.9)$ ----------56=_____

57. (deg) $\tan(2330^\circ) + (719/1580)$ ----------57=_____

58. (rad) $\tan(263) + (328/259)$ ----------58=_____

59. The volume of a square based pyramid is 629 $in.^3$ Calculate the length of one edge of the base, if the height is 73 in. ----------59=_____in.

60. A circular spinner is divided into equal sections with the numbers 1, 3, 3, 4, 2, 5. Calculate the odds of landing on a space with with the letter A. ----------60=_____

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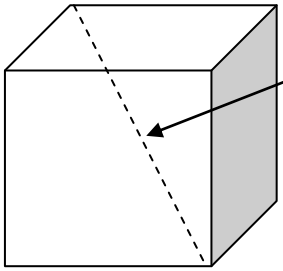
CUBE

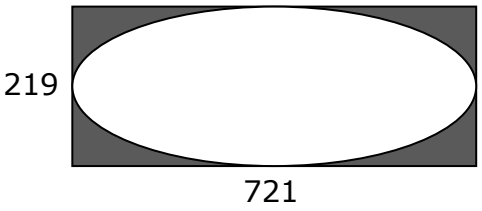


Inner Diagonal = 21105

Volume = ?

61=_____

RECTANGLE AND ELLIPSE



Shaded Area = ?

62=_____

63. $\frac{28! - 30!}{18!}$ ----------63=_____

64. (deg) $\frac{\sin(1.14°)}{2630}$ ----------64=_____

65. $(15.7 - \pi)e^{0.797}$ ----------65=_____

66. (deg) [4.89]sin(49.5° – 33°) ----------66=_____

67. (deg) cos(1.72° – 3.34°) + 0.122 ----------67=_____

68. (rad) tan[(4 – 3.88)(7.04)] ----------68=_____

69. (deg) $\frac{\sin(72.4°)}{\tan(72.4°)}$[115] ----------69=_____

70. $(337 - 317)^{0.0418 - 0.189}$ ----------70=_____

71. A typical scale for a terrestrial globe is 1 to 40 million. If Karen measured 8 inches from one point to another on the globe, calculate the number of miles between the points. ----------71=_____mi.

72. Calculate the number of gallons of water that must be added to 30 gallons of a 75% acid solution in order to produce a 30% acid solution. 72=_____gal.

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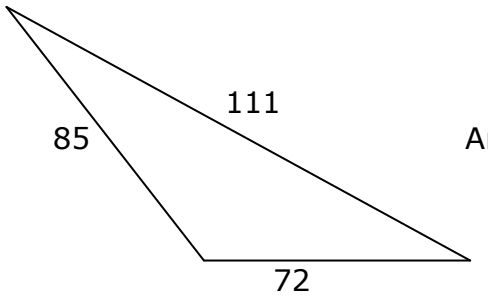
SCALENE TRIANGLE



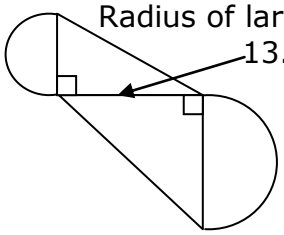
Area = ?

73=_____

RIGHT TRIANGLES AND SEMICIRCLES

Radius of small semicircle = 5.28

Radius of large semicircle = 8.52



Area = ?

74=_____

75. $\text{Ln}\left[\frac{329 + 60.8 + 301}{42.8 + 118 - 76.4}\right]$ ----------75=_____

76. $\frac{\text{Log}(3.88\text{x}10^{7} + 2.79\text{x}10^{7})}{7.78}$ ----------76=_____

77. $2\text{Log}\sqrt{\frac{(2.64)(3.35)}{0.248 + 0.403}}$ ----------77=_____

78. $(0.364)^{\pi}(101)^{4}(8.15 - 2.67)^{4}$ ----------78=_____

79. $1 + 2 + 3 + \ldots + 351$ ----------79=_____

80. $-\frac{1}{(6.8)} + \frac{1}{3(6.8)^{3}} - \frac{1}{5(6.8)^{5}} + \frac{1}{7(6.8)^{7}}$ ----------80=_____

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2015-2016 TMSCA Middle School Calculator Test #2 Answer Key

Page 1

1 = 25.1
= 2.51×10^{1}

2 = 129
= 1.29×10^{2}

3 = 757
= 7.57×10^{2}

4 = 9.14
= 9.14×10^{0}

5 = -2190
= -2.19×10^{3}

6 = -69.6
= -6.96×10^{1}

7 = 8.24
= 8.24×10^{0}

8 = -0.194
= -1.94×10^{-1}

9 = 3.89×10^{6}

10 = 2.56×10^{10}

11 = $164.78

12 = 900 INT.

13 = 3.17
= 3.17×10^{0}

Page 2

14 = 282
= 2.82×10^{2}

15 = 64500
= 6.45×10^{4}

16 = -4420
= -4.42×10^{3}

17 = 2.34
= 2.34×10^{0}

18 = 0.767
= 7.67×10^{-1}

19 = 3.14×10^{-5}

20 = -5.35
= -5.35×10^{0}

21 = 9.12×10^{11}

22 = 1.74
= 1.74×10^{0}

23 = 0.435
= 4.35×10^{-1}

24 = 9.21
= 9.21×10^{0}

25 = 3.47
= 3.47×10^{0}

26 = 24 INT.

Page 3

27 = -4.21×10^{9}

28 = 1.12×10^{-9}

29 = -4.30×10^{-12}

30 = 2.86×10^{-16}

31 = -0.00310
= -3.10×10^{-3}

32 = 0.00849
= 8.49×10^{-3}

33 = 1.84
= 1.84×10^{0}

34 = 402000
= 4.02×10^{5}

35 = 14.8
= 1.48×10^{1}

36 = 127
= 1.27×10^{2}

37 = 148
= 1.48×10^{2}

38 = 8.51×10^{-7}

Page 4

39 = 117000
= 1.17×10^{5}

40 = 8.78×10^{15}

41 = 15.7
= 1.57×10^{1}

42 = 3810
= 3.81×10^{3}

43 = 24.3
= 2.43×10^{1}

44 = 0.925
= 9.25×10^{-1}

45 = 66600
= 6.66×10^{4}

46 = 24.4
= 2.44×10^{1}

47 = 55.7
= 5.57×10^{1}

48 = -80.0
= -8.00×10^{1}

49 = 17300
= 1.73×10^{4}

50 = 1240
= 1.24×10^{3}

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Page 5

51 = -0.961
= -9.61×10^{-1}

52 = 0.00202
= 2.02×10^{-3}

53 = 3.30×10^{8}

54 = 806
= 8.06×10^{2}

55 = 6.09×10^{-6}

56 = -33.7
= -3.37×10^{1}

57 = 0.279
= 2.79×10^{-1}

58 = 0.0222
= 2.22×10^{-2}

59 = 5.08
= 5.08×10^{0}

60 = 0.00
= 0.00×10^{0}

Page 6

61 = 1.81×10^{12}

62 = 33900
= 3.39×10^{4}

63 = -4.14×10^{16}

64 = 7.56×10^{-6}

65 = 27.9
= 2.79×10^{1}

66 = 1.39
= 1.39×10^{0}

67 = 1.12
= 1.12×10^{0}

68 = 1.13
= 1.13×10^{0}

69 = 34.8
= 3.48×10^{1}

70 = 0.643
= 6.43×10^{-1}

71 = 5050
= 5.05×10^{3}

72 = 45.0
= 4.50×10^{1}

Page 7

73 = 3060
= 3.06×10^{3}

74 = 342
= 3.42×10^{2}

75 = 2.10
= 2.10×10^{0}

76 = 1.01
= 1.01×10^{0}

77 = 1.13
= 1.13×10^{0}

78 = 3.92×10^{9}

79 = 61800
= 6.18×10^{4}

80 = -0.146
= -1.46×10^{-1}

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TMSCA 15-16 MS CA Test #2 Solutions to Word and Geometry Problems

11. 192.75 – 19.26 – 8.71
Use the SHOW key to see the cents.

12. 45 = 3 x 3 x 5
60 = 2 x 2 x 3 x 5
75 = 5 x 5 x 3
LCM = 3 x 3 x 2 x 2 x 5 x 5
You must write the answer as 900, not 900.00 since it asks for INT.

13. Six two-liter bottles is 12 liters. On the RPN calculator use the key to convert to gallons.
12 [ENTER] left shift [2]

24. $\sqrt{27\pi}$

25. 208 ÷ 60

26. Ted = T
Fran = T + 11
Together = T + T + 11 = 59
2T + 11 = 59 so 2T = 59 – 11
2T = 48 T = 24

35. rate x time = distance so
$$t = \frac{distance}{rate}$$
Time = 787 ÷ 53

36. $\frac{d_1}{{t_1}^2} = \frac{d_2}{{t_2}^2}$ so $\frac{17.8}{3^2} = \frac{x}{8^2}$
$x = 17.8(8^2) \div 3^2$

37. Perimeter = πr + 2r
P = π(28.72) + 2(28.72)

38. Area =
$\frac{1}{2}\ product\ of\ diagonals$
$= \frac{1}{2}\ (.00185)(.00092)$

47. Average speed is total distance ÷ by total time
1st part of trip took 3 hours (150 ÷ 50). 2nd part took 4 hours (240 ÷ 60).
$$\frac{150 + 240}{3 + 4}$$

48. discriminant = $b^2 - 4ac$
For $0 = 3x^2 - 2x + 7$. a = 3, b = -2, c = 7
$(-2)^2 - 4(3)(7)$

49. $a^2 + b^2 = c^2$ so
$x = \sqrt{20001^2 - 10008^2}$

50. $\frac{\tan 39}{1} = \frac{1001}{x}$ so
X = 1001 ÷ tan 39

59. $V = \frac{1}{3}\ e^2 h$ so
$e = \sqrt{\frac{3V}{h}} = \sqrt{\frac{3(629)}{73}}$

60. Since there are no A's, the odds of getting an "A" are 0.00.

61. edge =
inner diagonal ÷ $\sqrt{3}$
Volume = e^3. So V = $\left(\frac{21105}{\sqrt{3}}\right)^3$

62. rectangle – ellipse
Area of rectangle = 219(721)
Area of ellipse = $\frac{219}{2}\ x\ \frac{721}{2}\ \pi$

$$219(721) - \left(\frac{219}{2}\right)\left(\frac{721}{2}\right)\pi$$

71. $\frac{1}{40{,}000{,}000} = \frac{8}{x}$ so
$x = 40{,}000{,}000(8)$ This is in inches. To convert to miles divide by 12 and then by 5280.
$$\frac{40{,}000{,}000(8)}{12(5280)}$$

72. gallons times % acid = pure acid.
30(.75) + x(0%) = (30+x)(.3)
22.5 = 9 + .3x so x = $\frac{22.5-9}{.3}$

73. A =
$\sqrt{s(s-a)(s-b)(s-c)}$
Where s = semi-perimeter
a,b,c are the sides.
s = $\frac{85+111+72}{2}$ = 134
A = $\sqrt{134\,(134-85)(134-111)(134-72)}$

74. semi-circles = $5.28^2\pi \div 2$ and $8.52^2\pi \div 2$
Triangles = 5.28(2)(13.34)÷2 and 8.52(2)(13.34) ÷2
Find the sum of all of these.