8

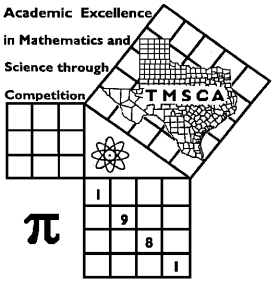
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

PLACE LABEL BELOW

Name:_____ School:_____

SS/ID Number:_____ City:_____

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



TMSCA MIDDLE SCHOOL CALCULATOR TEST #12 ©

FEBRUARY 16, 2019

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.

2018-2019 TMSCA Middle School Calculator Test 12

1. 405 – 1010 ---------- 1=_____

2. 6 – 29 – 5 ---------- 2=_____

3. –15.2 + 11 + 3.7 ---------- 3=_____

4. π – 1 + 3 – 8 ---------- 4=_____

5. 1180 – 1010 – 1960 + 2100 ---------- 5=_____

6. –35.6 – 58.4 – 217 + 157 + 146 ---------- 6=_____

7. (0.425 + 0.74 – 0.859) – (0.284 + 1.33) ---------- 7=_____

8. (–1.46 – 2.71) + (1.4 – 2.75 – 1.31) ---------- 8=_____

9. 118 x 145 x 679 ---------- 9=_____

10. 1010 x 147 x 7720 x 697 ----------10=_____

11. The area of a square is 521 square inches. Calculate the perimeter of the square in inches. ----------11=_____in.

12. Calculate the median of the following list of numbers. Pi, 32, 4^2, 8, $\sqrt{10}$, 1.87, 7^0, and $\sqrt{24}$. ----------12=_____

13. The sum of three consecutive integers is 456. Calculate the value of the smallest integer. ----------13=_____INT.

14. $(12)[29 \times 106 \times 41]$ ----------14=_____

15. $(31)[129 \times 64/80]$ ----------15=_____

16. $\{(-107)(132 - 102)(277)\} - 4.33 \times 10^5$ ----------16=_____

17. $\left[\frac{109}{35}\right][(152/88) + 0.717]$ ----------17=_____

18. $\left[\frac{170/105}{35/58}\right]\{21.4 + 15.4 - 14.4\}$ ----------18=_____

19. $\frac{(176/204) + (67/317)}{(0.0437 - 0.0405)}$ ----------19=_____

20. $\frac{(313)(0.00147)}{0.00398}(455 - 483)$ ----------20=_____

21. $\frac{195}{(247 - 225)} - \frac{(280 - 228)}{220}$ ----------21=_____

22. $\left[\frac{1560 + 2190}{5030 - 2010}\right]\left[\frac{4030}{2420}\right]$ ----------22=_____

23. $\frac{[-(2650 + 5680)(5790 - 3560)]}{(0.00355/(1.49))}$ ----------23=_____

24. Brian wanted to go to the parade that was 1.5 miles from his house. He woke up late, so he ran to the parade route at 11 mph. After the parade was over, he walked back home at 4 mph. Calculate how long the round trip took him in hours. ----------24=_____hrs.

25. A circle has an area of 425.7 square inches. This circle is inscribed in a square. Calculate the area of the square in square inches. ----25=_____in^2

26. Randy and Jill are buying appetizers for their party. They have decided on 5 pounds of Tiger Shrimp at $11.06 per pound, 10 pounds of wings for $2.78 per pound, 4 vegetable platters at $9.99 each, and 2 deli platters at $26.99 each. Calculate the cost of the food for their party. ----------26=$_____

27. $\dfrac{(50.9 - 52.4)(1.21 + 0.376)}{(4.17\text{x}10^{10})}$ ----------27=_____

28. $[665 - (1090 + 411)] + [(0.498)(290 - 869)]$ ----------28=_____

29. $\dfrac{(3.50\text{x}10^{6}) + (3.45\text{x}10^{6})}{(-0.0038)(0.00236) - 7.60\text{x}10^{-6}}$ ----------29=_____

30. $\dfrac{(622 + 536)}{(9.93\text{x}10^{10})}$ ----------30=_____

31. $\dfrac{1}{0.0356} + \dfrac{1}{(0.0423 - 0.0309)}$ ----------31=_____

32. $(0.195)\left[\dfrac{165}{(2.76\text{x}10^{-14})}\right]$ ----------32=_____

33. $1/(0.0016 - 5.84\text{x}10^{-4}) - 1/(4.18\text{x}10^{-4})$ ----------33=_____

34. $\left[\dfrac{1/103}{1/222}\right][1.32\text{x}10^{6}]$ ----------34=_____

35. The area of a rectangle is 264 square feet. The length is 10 more than the width. Calculate the length of the rectangle in feet. ------35=_____ft.

36. Sally completed task A in a speedy 32 minutes. Tommy is slower and completes task A in 45 minutes. Calculate the time it would take to complete task A if they worked together. ----------36=_____min.

RECTANGLE

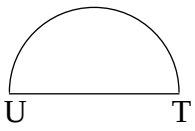
Perimeter = 557.6

221.8

Diagonal = ?

37=_____

SEMICIRCLE



Arc UT = 5213

Area = ?

38=_____

39. $(33.2 + 34.2)^2(83 + 25.7)^2$ ----------39=_____

40. $\sqrt[3]{\frac{0.182 + 1.4}{4550 - 2780}}$ ----------40=_____

41. $(81.1 + 79.9 + 88.8)^2(0.108 + 0.123)^2$ ----------41=_____

42. $(79500)\sqrt{160 + 138 + 135}$ ----------42=_____

43. $\sqrt{(11.5/22.1) + 0.442 - 0.323}$ ----------43=_____

44. $\sqrt{1350 - 1330 + 404} - \sqrt{214}$ ----------44=_____

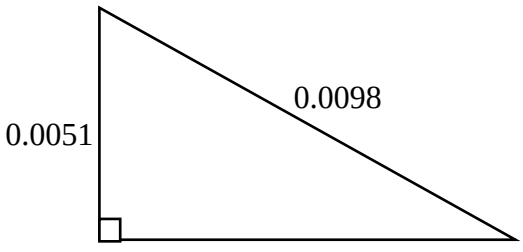
45. $(239)\sqrt[3]{71.9 + 205 - 74.9}$ ----------45=_____

46. $\sqrt{0.736 - 1140/1940} + 1/\sqrt{42.8 + 9.05}$ ----------46=_____

47. The height of an equilateral triangle is 57218 inches. Calculate the length of one of the sides of the triangle in inches. ----------47=_____in.

48. Calculate 469^{-964}. ----------48=_____

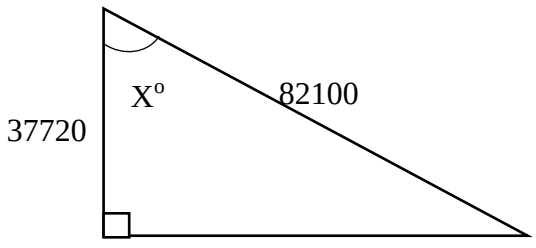
RIGHT TRIANGLE



Perimeter = ?

49=_____

RIGHT TRIANGLE



X^o = ?

50=_____

51. $\left[\dfrac{62.9 - 33.5 + \sqrt{18100/39.2}}{-13.5 + 128}\right]^4$ ----------51=_____

52. $\dfrac{(24.6 + 8.47 - 23.6)^3}{\sqrt{1290 + 2640 + 1260}}$ ----------52=_____

53. $\left[\dfrac{3840 + 8420 + \sqrt{1.47x10^8 + 2.91x10^7}}{50.7/11.8}\right]^2$ ----------53=_____

54. $(44.3)^2 \sqrt{(186)/(112)} - (937 + 563)$ ----------54=_____

55. $681 + \sqrt{(845)(756)} - (205 + 885)$ ----------55=_____

56. $\sqrt{\dfrac{1/(189 - 145)}{(168)(31.7 + 26.5)^4}}$ ----------56=_____

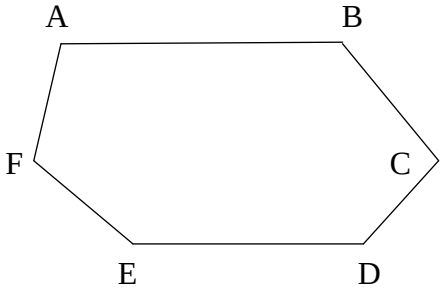
57. $\sqrt{\dfrac{1/(2020 - 643)}{(309)(7.52 + 32.9)^{-6}}}$ ----------57=_____

58. (deg) $\tan(832^\circ) + (56.5/46.4)$ ----------58=_____

59. Calculate how many arrangements of letters using 3 consonants and 2 vowels can be formed out of 7 consonants and 4 vowels. ---59=_____INT.

60. A 20 foot by 30 foot pool is surrounded by a deck of uniform width. The area of the deck is equal to the area of the pool. Calculate the width of the deck in feet. ----------60=_____ft.

HEXAGON

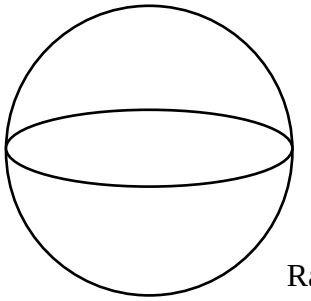


Angle A = 5x + 4
Angle B = 6x + 8
Angle C = 4x + 22
Angle D = 7x - 8
Angle E = 6.2x
Angle F = 7x - 10

Smallest Angle = ?°

61=_____

SPHERE



Diameter = 72.55

Ratio of Volume to Surface Area = ?

62=_____

63. $\frac{12! + 11!}{14!}$ ----------63=_____

64. $(4.03x10^5 - 3.31x10^5)^4(2.88x10^6)$ ----------64=_____

65. (deg) (33.6 – 31.2)cos(42.1°) ----------65=_____

66. (deg) [52.1]tan(8.18° – 8.15°) ----------66=_____

67. (deg) cos(77.1° – 37.3°) + 0.233 ----------67=_____

68. (deg) $\frac{\sin(20.6°) - \tan(20.6°)}{\sin(20.6°)}$ ----------68=_____

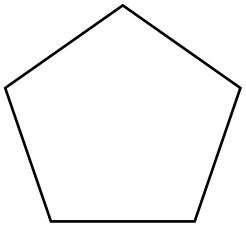
69. (deg) $\frac{\sin(38°)}{168 + 241}$ ----------69=_____

70. $(1230 - 1070)^{0.527 - 0.113}$ ----------70=_____

71. If it takes14 hrs for a faucet with a flow of 18 liters per minute to fill a pool with water. Calculate the time it will take if the flow is reduced to 10 liters per minute. ----------71=_____hrs.

72. TMSC is a square. A is the midpoint of MS and B is the midpoint of TM. A point is selected at random in the square. Calculate the probability that it lies in the triangle BMA. ----------72=_____

REGULAR PENTAGON

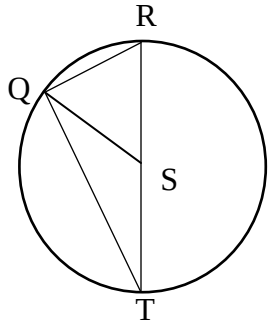


Area = 1521

Perimeter = ?

73=_____

CIRCLE S AND TRIANGLE



QS = 5.25
QR = 6.71

QT = ?

74=_____

75. $\text{Ln}\left[\frac{112 + 172 + 125}{101 + 94.5 - 78.1}\right]$ ----------75=_____

76. $\frac{(2.1)^{0.213}(6.39)^{0.208}}{(5.07 - 4.71)^{-10}}$ ----------76=_____

77. $2\text{Log}\sqrt{\frac{(2.82)(\pi)}{0.224 + 0.532}}$ ----------77=_____

78. $\text{Ln}\left[\frac{15.7 + 34.1 + 23.9}{1820 - 376 - 324}\right]$ ----------78=_____

79. $1 + 3 + 5 + \ldots + 805$ ----------79=_____

80. $1 + 0.56 + (0.56)^2 + \frac{(0.56)^4}{8} - \frac{(0.56)^5}{15}$ ----------80=_____

2018-2019 TMSCA Middle School Calculator Test 12 Answer Key

Page 1

1 = -605
= -6.05×10^{2}

2 = -28.0
= -2.80×10^{1}

3 = -0.500
= -5.00×10^{-1}

4 = -2.86
= -2.86×10^{0}

5 = 310
= 3.10×10^{2}

6 = -8.00
= -8.00×10^{0}

7 = -1.31
= -1.31×10^{0}

8 = -6.83
= -6.83×10^{0}

9 = 1.16×10^{7}

10 = 7.99×10^{11}

11 = 91.3
= 9.13×10^{1}

12 = 4.03
= 4.03×10^{0}

13 = 151 INT.

Page 2

14 = 1.51×10^{6}

15 = 3200
= 3.20×10^{3}

16 = -1.32×10^{6}

17 = 7.61
= 7.61×10^{0}

18 = 60.1
= 6.01×10^{1}

19 = 336
= 3.36×10^{2}

20 = -3240
= -3.24×10^{3}

21 = 8.63
= 8.63×10^{0}

22 = 2.07
= 2.07×10^{0}

23 = -7.80×10^{9}

24 = 0.511
= 5.11×10^{-1}

25 = 542
= 5.42×10^{2}

26 = $177.04

Page 3

27 = -5.71×10^{-11}

28 = -1120
= -1.12×10^{3}

29 = -4.19×10^{11}

30 = 1.17×10^{-8}

31 = 116
= 1.16×10^{2}

32 = 1.17×10^{15}

33 = -1410
= -1.41×10^{3}

34 = 2.85×10^{6}

35 = 22.0
= 2.20×10^{1}

36 = 18.7
= 1.87×10^{1}

37 = 229
= 2.29×10^{2}

38 = 4330000
= 4.33×10^{6}

Page 4

39 = 5.37×10^{7}

40 = 0.0963
= 9.63×10^{-2}

41 = 3330
= 3.33×10^{3}

42 = 1.65×10^{6}

43 = 0.800
= 8.00×10^{-1}

44 = 5.96
= 5.96×10^{0}

45 = 1400
= 1.40×10^{3}

46 = 0.524
= 5.24×10^{-1}

47 = 66100
= 6.61×10^{4}

48 = 9.76×10^{-2576}

49 = 0.0233
= 2.33×10^{-2}

50 = 62.6
= 6.26×10^{1}

2018-2019 TMSCA Middle School Calculator Test 12 Answer Key

Page 5

51 = 0.0390
= 3.90×10^{-2}

52 = 11.8
= 1.18×10^{1}

53 = 3.53×10^{7}

54 = 1030
= 1.03×10^{3}

55 = 390
= 3.90×10^{2}

56 = 3.43×10^{-6}

57 = 101
= 1.01×10^{2}

58 = -1.26
= -1.26×10^{0}

59 = 2520 INT.

60 = 5.00
= 5.00×10^{0}

Page 6

61 = 102
= 1.02×10^{2}

62 = 12.1
= 1.21×10^{1}

63 = 0.00595
= 5.95×10^{-3}

64 = 7.74×10^{25}

65 = 1.78
= 1.78×10^{0}

66 = 0.0273
= 2.73×10^{-2}

67 = 1.00
= 1.00×10^{0}

68 = -0.0683
= -6.83×10^{-2}

69 = 0.00151
= 1.51×10^{-3}

70 = 8.18
= 8.18×10^{0}

71 = 25.2
= 2.52×10^{1}

72 = 0.125
= 1.25×10^{-1}

Page 7

73 = 149
= 1.49×10^{2}

74 = 8.08
= 8.08×10^{0}

75 = 1.25
= 1.25×10^{0}

76 = 6.30×10^{-5}

77 = 1.07
= 1.07×10^{0}

78 = -2.72
= -2.72×10^{0}

79 = 162000
= 1.62×10^{5}

80 = 1.88
= 1.88×10^{0}

TMSCA 18-19 MS CA Test #12 Solutions to Word and Geometry Problems

11. $4\left(\sqrt{521}\right)$

12. The numbers in order are:

$7^0, 1.87, \pi, \sqrt{10}, \sqrt{24}, 8, 4^2, 32$

Since there are 8 numbers, average the two in the middle.

$$\frac{\sqrt{10}+\sqrt{24}}{2}$$

13. The middle integer is $\frac{456}{3} = 152$. Add 1 to get the largest integer.

24. $time = \frac{distance}{rate}$

$$\frac{1.5}{11}+\frac{1.5}{4}$$

25. diameter = side of square

$$\pi r^2 = 425.7$$

$$r = \sqrt{\frac{425.7}{\pi}};\ d = 2\left(\sqrt{\frac{425.7}{\pi}}\right)$$

A = $d^2 = \left[2\left(\sqrt{\frac{425.7}{\pi}}\right)\right]^2$

26.

$5(11.06) + 10(2.78) + 4(9.99) + 2(26.99)$

35. $w = width; w + 10 = length$

$$w(w+10) = 264$$

$$w^2 + 10w - 264 = 0$$

Use the quadratic formula or factor to find the width. 12.0. Therefore the length is 22.0.

36. $\frac{32(45)}{32+45}$

37. $width = \frac{557.6-221.8(2)}{2} = 57$

$$diagonal = \sqrt{57^2 + 221.8^2}$$

38. $\pi r = 5213$ *so* $r = \frac{5213}{\pi}$

$$Area = \frac{\pi r^2}{2} = \frac{\pi\left(\frac{5213}{\pi}\right)^2}{2}$$

47. $2\left(\frac{57218}{\sqrt{3}}\right)$

48. **469^{-964}** -964 ENTER 469 LOG x SHOW

(Look at the digits to the left of the decimal. This gives -2575 for the exponent. Write down -2575.) Punch

-2575 [–] [10^x]

(This gives 9.76 E-1) Since it says E-1, you have to add -1 to -2575. This is done on the HP RPN calculator.

49.

$\sqrt{.0098^2 - .0051^2} + .0051 + .0098$

50. $\frac{\cos x}{1} = \frac{37720}{82100}$

$$\text{acos or } cos^{-1}\left(\frac{37720}{82100}\right)$$

59. $\left(\frac{7!}{(7-3)!}\right)\left(\frac{4!}{(4-2)!}\right)$

60. Deck width = x

Dimensions of outside of deck = (20+2x) and (30+2x)

$$\frac{1}{2}(20+2x)(30+2x) = 600$$

(20 + 2x)(30 + 2x) = 1200

60. contd.

$$4x^2 + 100x - 600 = 0.$$

Use quadratic formula or factor to find x.

61. The sum of the angles in a hexagon is 180(6-2) = 720°. The sum of the given angles is 35.2x + 16.

Eq: 35.2x + 16 = 720

x = 20. Substitute 20 for x in the angles and Angle C is the smallest at 102°.

62. $\frac{V}{SA} = \frac{\frac{4}{3}\pi r^3}{4\pi r^2} = \frac{1}{3}r$

$$diameter = 72.55$$

$$radius = \frac{72.55}{2}$$

Ratio is $\frac{1}{3}\left(\frac{72.55}{2}\right)$

71. 14(18) = 10x

$$x = \frac{14(18)}{10}$$

72. Triangle BMA is 1/8 of the square. You can see this if you connect all midpoints to each other.

73. $\frac{Perimeter^2}{\left(tan\frac{180}{5}\right)(4)(5)} = 1521$

$$P = \sqrt{1521\left[\left(tan\frac{180}{5}\right)(4)(5)\right]}$$

74. Since $\overline{RST}$ is a diameter, triangle QRT is a right triangle.

$\overline{RT} = 5.25(2)$

$$\overline{QR} = 6.71$$

$$\overline{QT} = \sqrt{[(5.25)(2)]^2 - 6.71^2}$$