8

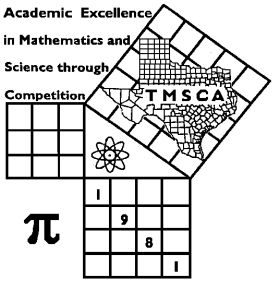
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #5 ©

NOVEMBER 17, 2018

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. TI-Nspire and HP Prime 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 5

1. 236 + 1290 ---------- 1=_____

2. 23 + 15 – 5 ---------- 2=_____

3. –741 – 127 + 211 ---------- 3=_____

4. π + 7 – 11 – 2 ---------- 4=_____

5. –754 + 250 + 770 + 1480 ---------- 5=_____

6. 112 – 111 – 173 + 167 + 65.6 ---------- 6=_____

7. π – 1.6 + 1.02 – 1.27 – 1.35 ---------- 7=_____

8. 3.95 + 6.43 + 2.23 + 4.64 + 5.97 ---------- 8=_____

9. 288 x 502 x 32.6 ---------- 9=_____

10. 376 x 1570 x 56.4 x 1330 ----------10=_____

11. The average of 7 numbers is 316.5. The average of another 5 numbers is 825.1. Calculate the overall average. ----------11=_____

12. Shawn built a fence around his rectangular pool. The posts are 2 yards apart. There are 4 posts along the width and 8 posts along the length. Calculate the number of posts needed to build the fence. ----------12=_____INT.

13. In problem #12, calculate the perimeter of the fence in feet. ------13=_____ft.

14. (60/330)[413 – 265] ----------14=_____

15. (19)[107 x 88 x 18] ----------15=_____

16. {(33)(45 – 60)(19)} – 1590 ----------16=_____

17. $\left[\frac{64}{36}\right]$ [(37/52) + 0.0989] ----------17=_____

18. $\left[\frac{(0.00777 + 0.00773)}{147/83}\right]\left[\frac{1.22}{87.6}\right]$ ----------18=_____

19. $\left[\frac{445/108}{485/209}\right]$ {17.3 + 24.5 – 40} ----------19=_____

20. (390)[276/149 x 174/32] – 2430 ----------20=_____

21. $\frac{(1.07x10^{-4})(0.00108)}{1.2}$ (9.11 – 2.44) ----------21=_____

22. $\frac{[-(1600 + 2600)(5190 – 6300)]}{(8.71/(15500))}$ ----------22=_____

23. $\left[\frac{5860 + 6140}{7990 – 1040}\right]\left[\frac{2260}{8160}\right]$ ----------23=_____

24. Calculate the geometric mean of 50 and 500. ----------24=_____

25. The maximum length of an official soccer field is 120 meters.
Calculate this length in feet. ----------25=_____ft.

26. The interior angles of a hexagon are in the ratio of 2:2:3:3:4:5.
Calculate the measure of the largest angle. ----------26=_____°

27. $(33.5)[(0.0481/0.149)(0.071 + 0.0138)]$ ----------27=_____

28. $(165)[[0.102/(0.0564)][0.0328/(0.0844)]]$ ----------28=_____

29. $\dfrac{(1.64\text{x}10^{9}) + (5.31\text{x}10^{9})}{(-1.29)(\pi) - 0.145}$ ----------29=_____

30. $(55.3)\left[\dfrac{0.00149}{(7.27\text{x}10^{11})}\right]$ ----------30=_____

31. $[0.0575]\left[\dfrac{1/0.225}{1/(0.685)}\right]$ ----------31=_____

32. $\dfrac{(0.0218 + 0.021)}{(3.13\text{x}10^{12})}$ ----------32=_____

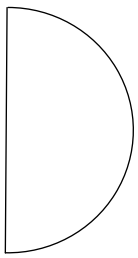
33. $1/(0.00108 - 0.00171) - 1/(-3.99\text{x}10^{-4})$ ----------33=_____

34. $\left[\dfrac{1/166}{1/228}\right] + [0.346]$ ----------34=_____

35. Cali and Carl work together to complete a task in 5 hours. If Cali is gone, it takes Carl 9.5 hours to complete the task. Calculate how long it would take Cali to complete the task if Carl is gone. --------35=_____hrs.

36. Calculate the value of the 21st hexagonal number. ----------36=_____INT.

SEMICIRCLE

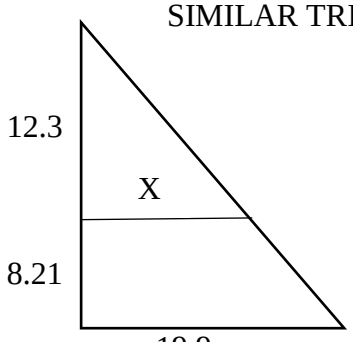


Radius = 0.0207

Perimeter = ?

37=_____

SIMILAR TRIANGLES



X = ?

38=_____

39. $\sqrt[3]{\frac{279 + 96.4}{666 - 574}}$ ----------39=_____

40. $\left[\frac{506}{6510}\right](11.8 + 7.2)^3$ ----------40=_____

41. $(237 + 770 + 679)^2(14.9 + 10.9)^2$ ----------41=_____

42. $\sqrt{5800} + \sqrt{865 + 5450} - (\pi)\sqrt{3630}$ ----------42=_____

43. $(1/(0.002))(1210 - 946)^2$ ----------43=_____

44. $\sqrt{(1770/1700) + 0.955 - 0.717}$ ----------44=_____

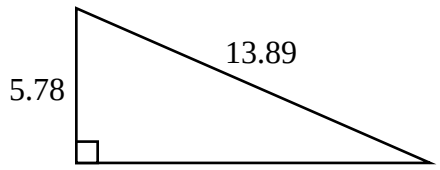
45. $\frac{1}{\sqrt{180 + 285 + 223}} + \left(\frac{1}{\sqrt{2.78}}\right)^3$ ----------45=_____

46. $\frac{(135 + 201)^{1/2}}{(45500 - 19900)^{1/2}}$ ----------46=_____

47. There are dimes, nickels, and quarters in the cash drawer. The number of quarters is four more than three times the numbers of dimes. There are the same number of dimes as nickels. The drawer contains $16.30 in coins. Calculate the value of the quarters in the drawer. ----------47=$_____

48. A right triangle has a base of 13 cm and a height of 95 cm. Calculate the side of a square in cm, with the same area as the triangle. ----------48=_____cm

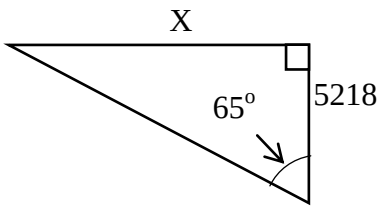
RIGHT TRIANGLE



Area = ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\dfrac{(1.14 + 4.92 - 3.2)^2}{\sqrt{146 + 401 + 253}}$ ----------51=_____

52. $\left[\dfrac{\sqrt{\sqrt{500 - 184}}}{-(1780 - 3270)}\right]^3 [113 + 376]$ ----------52=_____

53. $\left[\dfrac{1280-454+\sqrt{(1.67\times10^8)/303}}{-1.51+10.9}\right]^2$ ----------53=_____

54. $3.21 + \sqrt{(4620)/(55.7)} - (0.774 + 1.31)^2$ ----------54=_____

55. $(0.564)(6.10\text{x}10^6)^{1/2} - [(5.75\text{x}10^5)(4.40\text{x}10^6)]^{1/4}$ -------55=_____

56. $\sqrt{\dfrac{(11400)(40000)}{(2.39\text{x}10^5)(11500)}} - 0.226 + 0.172$ ----------56=_____

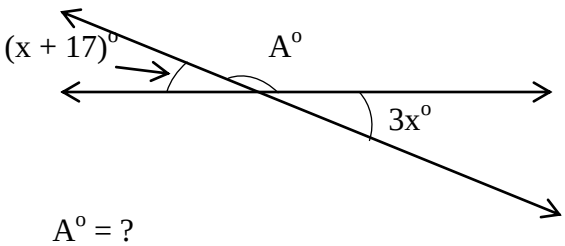
57. (rad) sin(25.7) + (64.3/13.5) ----------57=_____

58. (deg) sin(301°) + (223/153) ----------58=_____

59. Two angles form a linear pair. The first angle measures $(15x - 8)^\circ$ and the second $(8x + 15)^\circ$. Calculate the measure of the smaller angle in degrees. ----------59=_____°

60. Calculate the percent interest on \$1200 needed to match the interest earned on \$500 at 5% in one year. ----------60=_____%

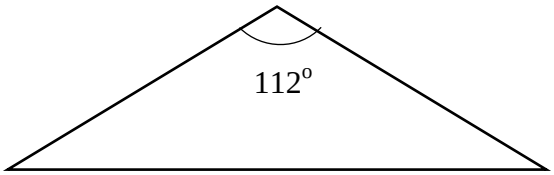
INTERSECTING LINES



A^o = ?

61=_____

ISOSCELES TRAINGLE



6818

Area = ?

62=_____

63. $\frac{12! - 10!}{15!}$ ----------63=_____

64. (deg) (4.92 – 4.32)cos(1.52°) ----------64=_____

65. (deg) $\frac{\tan(9.58°)}{5540}$ ----------65=_____

66. (deg) sin(2.23° – 5.3°) + 0.0222 ----------66=_____

67. (rad) $\frac{\cos(17.1)}{72.8/46.2}$ ----------67=_____

68. (rad) (0.445)cos(575) ----------68=_____

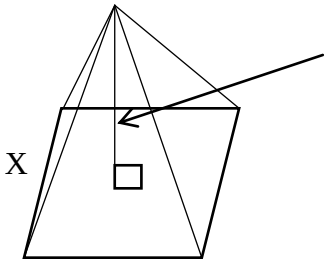
69. (deg) $\frac{\sin(56.2°)}{\tan(56.2°)}$[9.52] ----------69=_____

70. $(40.2 + 33.3 + 27)^{3/5}$ ----------70=_____

71. Calculate the discriminate of the quadratic equation $5x - 12x^2 = 8$. 71=_____INT.

72. If the odds of an event happening is 9/7, calculate the probability of the event happening. ----------72=_____

SQUARE BASED PYRAMID



Height = 23.27

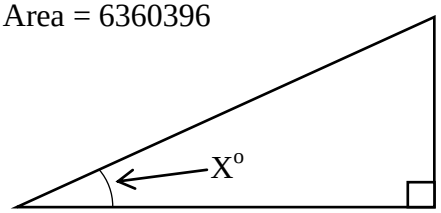
Volume = 2718

X = ?

73=_____

RIGHT TRIANGLE

Area = 6360396



5221

X^o = ?

74=_____

75. $\frac{\text{Log}(7.65\text{x}10^6 + 5.39\text{x}10^6)}{15.7}$ ----------75=_____

76. $\frac{5.41 + \sqrt{(26)(19.7)} + (1.6)(\pi)}{\sqrt{\sqrt{0.142 + 0.0712}}}$ ----------76=_____

77. $2\text{Log}\sqrt{\frac{(162)(1.57)}{6.36 + 6.51}}$ ----------77=_____

78. $\text{Ln}\left[\frac{20 + 23.3 + 21.9}{81.3 - 26.7 - 36.1}\right]$ ----------78=_____

79. $1 + 3 + 5 + \ldots + 883$ ----------79=_____

80. $1 + (0.93) + \frac{(0.93)^2}{2} + \frac{(0.93)^3}{6} + \frac{(0.93)^4}{24}$ ----------80=_____

2018-2019 TMSCA Middle School Calculator Test 5 Answer Key

Page 1

1 = 1530
= 1.53×10^{3}

2 = 33.0
= 3.30×10^{1}

3 = -657
= -6.57×10^{2}

4 = -2.86
= -2.86×10^{0}

5 = 1750
= 1.75×10^{3}

6 = 60.6
= 6.06×10^{1}

7 = -0.0584
= -5.84×10^{-2}

8 = 23.2
= 2.32×10^{1}

9 = 4.71×10^{6}

10 = 4.43×10^{10}

11 = 528
= 5.28×10^{2}

12 = 20 INT.

13 = 120
= 1.20×10^{2}

Page 2

14 = 26.9
= 2.69×10^{1}

15 = 3.22×10^{6}

16 = -11000
= -1.10×10^{4}

17 = 1.44
= 1.44×10^{0}

18 = 0.000122
= 1.22×10^{-4}

19 = 3.20
= 3.20×10^{0}

20 = 1500
= 1.50×10^{3}

21 = 6.42×10^{-7}

22 = 8.30×10^{9}

23 = 0.478
= 4.78×10^{-1}

24 = 158
= 1.58×10^{2}

25 = 394
= 3.94×10^{2}

26 = 189
= 1.89×10^{2}

Page 3

27 = 0.917
= 9.17×10^{-1}

28 = 116
= 1.16×10^{2}

29 = -1.66×10^{9}

30 = 1.13×10^{-13}

31 = 0.175
= 1.75×10^{-1}

32 = 1.37×10^{-14}

33 = 919
= 9.19×10^{2}

34 = 1.72
= 1.72×10^{0}

35 = 10.6
= 1.06×10^{1}

36 = 861 INT.

37 = 0.106
= 1.06×10^{-1}

38 = 11.9
= 1.19×10^{1}

Page 4

39 = 1.60
= 1.60×10^{0}

40 = 533
= 5.33×10^{2}

41 = 1.89×10^{9}

42 = -33.7
= -3.37×10^{1}

43 = 3.48×10^{7}

44 = 1.13
= 1.13×10^{0}

45 = 0.254
= 2.54×10^{-1}

46 = 0.115
= 1.15×10^{-1}

47 = $13.75

48 = 24.8
= 2.48×10^{1}

49 = 36.5
= 3.65×10^{1}

50 = 11200
= 1.12×10^{4}

2018-2019 TMSCA Middle School Calculator Test 5 Answer Key

Page 5

51 = 0.289
= 2.89×10^{-1}

52 = 1.11×10^{-5}

53 = 27900
= 2.79×10^{4}

54 = 7.97
= 7.97×10^{0}

55 = 132
= 1.32×10^{2}

56 = 0.353
= 3.53×10^{-1}

57 = 5.30
= 5.30×10^{0}

58 = 0.600
= 6.00×10^{-1}

59 = 75.2
= 7.52×10^{1}

60 = 2.08
= 2.08×10^{0}

Page 6

61 = 155
= 1.55×10^{2}

62 = 7840000
= 7.84×10^{6}

63 = 0.000364
= 3.64×10^{-4}

64 = 0.600
= 6.00×10^{-1}

65 = 3.05×10^{-5}

66 = -0.0314
= -3.14×10^{-2}

67 = -0.113
= -1.13×10^{-1}

68 = -0.443
= -4.43×10^{-1}

69 = 5.30
= 5.30×10^{0}

70 = 15.9
= 1.59×10^{1}

71 = -359 INT.

72 = 0.563
= 5.63×10^{-1}

Page 7

73 = 18.7
= 1.87×10^{1}

74 = 25.0
= 2.50×10^{1}

75 = 0.453
= 4.53×10^{-1}

76 = 48.7
= 4.87×10^{1}

77 = 1.30
= 1.30×10^{0}

78 = 1.26
= 1.26×10^{0}

79 = 195000
= 1.95×10^{5}

80 = 2.53
= 2.53×10^{0}

TMSCA 18-19 MS CA Test #5 Solutions to Word and Geometry Problems

11. $\frac{316.5(7)+825.1(5)}{12}$

12. The 4 corner posts don't need to be counted twice.
8 + 8 + 2 + 2

13. Calculate the number of spaces between posts.
Long sides: 7(2) + 7(2) = 28 yds.
Short sides: 3(2) + 3(2) = 12 yds.
40 yds. = 120 feet

24. $\sqrt{50(500)}$

25. 120 m = 12000 cm
If your calculator converts from cm to inches, do that. Then divide by 12.
Otherwise:

$$12000cm \cdot \frac{1\ in}{2.54\ cm} \cdot \frac{1\ ft.}{12\ in}$$

26. Total degrees on interior of regular polygon: 180(n-2) = 180(6-2) = 720
2x + 2x + 3x + 3x + 4x + 5x = 720
19x = 720. x = $\frac{720}{19}$
Longest side = $5\left(\frac{720}{19}\right)$

35. Working together (for two people): $\frac{xy}{x+y}$

$$\frac{9.5x}{9.5+x} = 5;$$
$$9.5x = 5(9.5 + x)$$
$$9.5x = 47.5 + 5x$$
$$4.5x = 47.5; x = \frac{47.5}{4.5}$$

36. Hexagonal number

$$\frac{n(4n-2)}{2} \ or\ n(2n-1)$$

$$\frac{21(84-2)}{2} \ or\ 21(42-1)$$

37. arc = πr
Perimeter = arc + $2r$

$$.0207\pi + 2(.0207)$$

38. $\frac{12.3+8.21}{19.9} = \frac{12.3}{x}$

$$x = \frac{(12.3)(19.9)}{12.3+8.21}$$

47. D = # of dimes
N = D = number of nickels
Q = 4 + 3D = number of quarters.
Value of coins =
10D + 5N + 25Q = 1630
Substitute values.
10D + 5D + 25(4 + 3D) = 1630
90D = 1530; D = $\frac{1530}{90}$ = 17
Quarters: 4 + 3(17) = 55
Value of quarters = 55(.25)

48. Triangle area = $\frac{13(95)}{2}$
Square = $side^2 = Area$

$$Side = \sqrt{\frac{13(95)}{2}}$$

49. Long leg = $\sqrt{13.89^2 - 5.78^2}$
Area = $\frac{\left(\sqrt{13.89^2 - 5.78^2}\right)(5.78)}{2}$

50. $\frac{tan\ 65}{1} = \frac{x}{5218}$

$$x = (tan\ 65)(5218)$$

59. $15x - 8 + 8x + 15 = 180$

$$23x = 173; \quad x = \frac{173}{23}$$

Substitute this value into 15x – 8 and 8x + 15 to find the smaller.

60. If you use 5 for 5%, the answer will be in a % form.
1200x = 500(5). $x = \frac{500(5)}{1200}$

61. $x + 17 = 3x; x = \frac{17}{2}$;

$$3x = 3\left(\frac{17}{2}\right)$$

$A^0 = 180 - 3\left(\frac{17}{2}\right)$

62. An altitude drawn from the 112^0 angle to the 6818 side divides the triangle into two congruent triangles. The angles used are 56^0 each. The base is also cut in half.
$\frac{\tan 56}{1} = \frac{3409}{h}; h = \frac{3409}{\tan 56}$
$A = \left(\frac{3409}{\tan 56}\right)(3409)$

71. $0 = 12x^2 - 5x + 8$
A = 12, b = -5, c = 8
Discriminant = $b^2 - 4ac$
$= (-5)^2 - 4(12)(8)$

72. $\frac{9}{16}$

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

$$2718 = \frac{1}{3}x^2(23.27)$$
$$x = \sqrt{\frac{2718(3)}{23.27}}$$

74. $A = \frac{1}{2}bh$

$$6360396 = \frac{1}{2}(5221)h$$
$$h = \frac{2(6360396)}{5221}$$
$$\frac{\tan x}{1} = \frac{h}{5221}$$
$$x = Atan\left(\frac{h}{5221}\right)$$