8

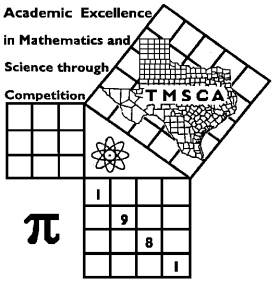
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #6 ©

DECEMBER 2, 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 6

1. 1120 + 662 ---------- 1=_____

2. 3.6 + 3.1 + 4.4 ---------- 2=_____

3. 1050 – 4780 – 1240 ---------- 3=_____

4. π + 2 + 11 + 5 ---------- 4=_____

5. 294 – 244 + 107 – 354 ---------- 5=_____

6. 42.7 + 61.2 – 86.3 – 184 + 104 ---------- 6=_____

7. 3.62 + 3.54 – 5.73 + 1.47 + 1.16 ---------- 7=_____

8. –2.74 + π + 4.29 + 1.42 + 3.41 ---------- 8=_____

9. 220 x 18 x 543 ---------- 9=_____

10. 2140 x 1030 x 441 x 63.5 ---------- 10=_____

11. Calculate the median of the following list of numbers.
72, 5, 22, 5π, 8, 13, 52, 101 ---------- 11=_____

12. A five gallon bucket is three-eighths full. Calculate the number of ounces in the bucket. ---------- 12=_____oz.

13. Four of the five angles in a pentagon measure 62°, 35°, 78°, and 112°. Calculate the measure of the fifth angle. ---------- 13=_____INT.$^{\circ}$

14. $(-266/156)[289 - 137]$ ---------- 14=_____

15. $(590)[369 \times 644 \times 532]$ ---------- 15=_____

16. $\{(-206)(205 - 202)(88)\} - 6470$ ---------- 16=_____

17. $\{-123/66\}\left[\frac{196}{232 + 192}\right]$ ---------- 17=_____

18. $\frac{[0.0201/(0.0325)]/0.0965}{(\pi \times 1.48)(2.53)}$ ---------- 18=_____

19. $\left[\frac{(370/292) - (1330/161)}{1.52/0.582}\right]$ ---------- 19=_____

20. $(202)[115/129 \times 55/17] - 347$ ---------- 20=_____

21. $\frac{34}{(65 - 55)} - \frac{(54 - 80)}{103}$ ---------- 21=_____

22. $\left[\frac{1040 + 455}{750 - 137}\right]\left[\frac{556}{111}\right]$ ---------- 22=_____

23. $\frac{(839 \times 162)/848}{(916 \times 1.22 \times 10^{-4}) + 0.0359}$ ---------- 23=_____

24. The ratio of crickets to cockroaches is 17 to 24. If there are a total of 738 crickets and cockroaches, calculate the number of crickets. ---------- 24=_____INT.

25. Calculate the product of the Least Common Multiple and Greatest Common Divisor of 222 and 32. ---------- 25=_____

26. Amount 1 is 22% less than Amount 2 and Amount 2 is 35% less than Amount 3. Calculate what percent less Amount 1 is less than Amount 3. ---------- 26=_____%

27. $\dfrac{(0.277 - 0.894)(0.0107 + 0.0138)}{(9.46\text{x}10^{10})}$ ---------- 27=_____

28. $\dfrac{(45.8 + 70.9)(2.49 + 2.12)}{(1.15\text{x}10^{12})}$ ---------- 28=_____

29. $[1350 - (2040 + 6340)] + [(12.5)(4310 - 4470)]$ ------- 29=_____

30. $(0.0456)\left[\dfrac{0.0428}{(7.31\text{x}10^{7})}\right]$ ---------- 30=_____

31. $[2.66]\left[\dfrac{1/0.302}{1/0.357}\right]$ ---------- 31=_____

32. $\dfrac{1}{0.00854} + \dfrac{1}{(\pi)(0.0206 - 0.0048)}$ ---------- 32=_____

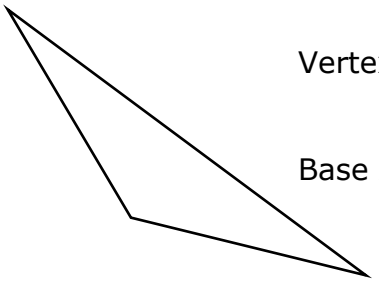
33. $\dfrac{1}{449} - \dfrac{1}{(173 + 477)}$ ---------- 33=_____

34. $1/(0.00256 - 0.00313) - 1/(-5.19\text{x}10^{-4})$ ---------- 34=_____

35. Three people can complete a task in 8 hours. Calculate how many hours it would take 7 people to complete the task. ---------- 35=_____hrs.

36. Mason has a jar containing quarters and dimes worth $23.45. If there are 63 less dimes than quarters, calculate the number of dimes. ---------- 36=_____INT.

ISOSCELES TRIANGLE

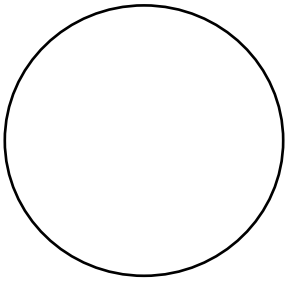


Vertex Angle = 135°

Base Angle = ?

37=_____

CIRCLE



Circumference = 2525

Area = ?

38=_____

39. $(0.0652 + 0.21)^2(4.07 + 5.21)^2$ ---------- 39=_____

40. $\dfrac{(36600 + 56700)^3}{(0.256 - 0.218)^2}$ ---------- 40=_____

41. $\left[\dfrac{86.6}{7.42}\right](914 + 2840)^4$ ---------- 41=_____

42. $(1/\pi)\sqrt{\dfrac{0.0576 + 0.0445}{0.0117 - 0.00196}}$ ---------- 42=_____

43. $\sqrt{531 - 372 + 120} - \sqrt{91}$ ---------- 43=_____

44. $(1/(0.0261))(4750 - 855)^3$ ---------- 44=_____

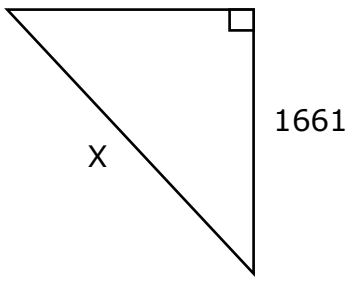
45. $\dfrac{1}{\sqrt{239 + 42.1 + 84.6}} + \left(\dfrac{1}{\sqrt{3.41}}\right)^4$ ---------- 45=_____

46. $\left[\sqrt[3]{(1.11/1.1)(33600)}\right]^5$ ---------- 46=_____

47. Calculate -3224^{832}. ---------- 47=_____

48. The speed a car can achieve in 10 seconds is inversely proportional to its' weight. After 10 seconds, a car that weighs 2400 pounds can achieve a speed of 44 miles per hour. Calculate the speed of a 1600 pound car after 10 seconds. ---------- 48=_____mph.

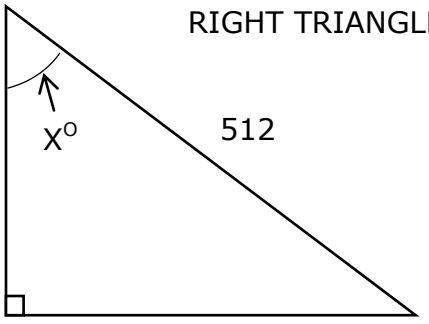
RIGHT TRIANGLE



X = ?

49=_____

RIGHT TRIANGLE



X^o = ?

50=_____

51. $\dfrac{(11.8 + 9.93 - 23.7)^3}{\sqrt{1760 + 2140 + 3080}}$ ---------- 51=_____

52. $\left[\dfrac{100 + 125 + \sqrt{15600 + 30200}}{1130/6790}\right]^3$ ---------- 52=_____

53. $\left[\dfrac{1650 - 1030 + \sqrt{1.36x10^9/4240}}{-205 + 273}\right]^2$ ---------- 53=_____

54. $(36.3)^2\sqrt{(19.3)/(1.21)} - (4080 + 1800)$ ---------- 54=_____

55. $1220 + \sqrt{(1160)(1630)} - (1360 + 2000)$ ---------- 55=_____

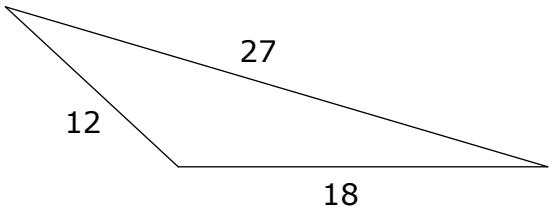
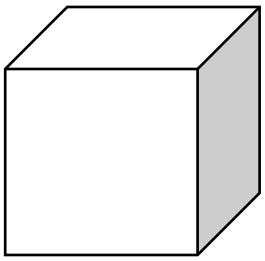
56. $\sqrt{\dfrac{1/(54.9 - 11.5)}{(114)(14.1 + 104)^5}}$ ---------- 56=_____

57. $\sqrt{\dfrac{1/(1730 - 814)}{(207)(5.36 + 16.6)^3}}$ ---------- 57=_____

58. $\sqrt{\dfrac{(9.32)(164)}{(2760) + (2990)}} + 1/(0.876)^{-5}$ ---------- 58=_____

59. Mandy is training by biking and running. She rides her bike to the park and then runs back home. The next day she runs to the park and rides her bike back home. She rides her bike at an average speed of 16.8 miles per hour and runs at an average speed of 9.2 miles per hour. The round trip takes 2 hours and 20 minutes. Calculate how far the park is from her house. ---------- 59=_____mi.

60. There are 73 marbles in a jar, all of the same size. There are 13 red, 31 white and 29 blue. Matt wants 2 blue marbles. Calculate the probability of drawing out 2 blue marbles. The first blue marble, when drawn, is not replaced. ---------- 60=_____

SCALENE TRIANGLE	CUBE
 Area = ?	 Volume = 0.0501 Surface Area = ?
61=_____	62=_____

63. $\frac{17!/3!}{14! + 16!}$ ---------- 63=_____

64. $(8.65 - \pi)e^{0.884}$ ---------- 64=_____

65. (deg) (188 – 308)tan(214°) ---------- 65=_____

66. (deg) (5800 – 30100)tan(98.4°) + 65800 ---------- 66=_____

67. (deg) [20]tan(123° – 98.6°) ---------- 67=_____

68. (deg) $\frac{\sin(0.698°) - \tan(0.698°)}{\sin(0.698°)}$ ---------- 68=_____

69. (deg) $\frac{\sin(8.51°)}{\tan(8.51°)}$[31.2] ---------- 69=_____

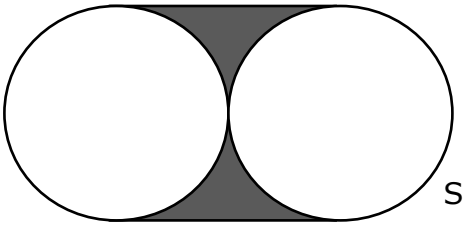
70. $(846 - 338)^{0.176 - 0.285}$ ---------- 70=_____

71. Calculate the length of a 21° 21 minute arc on a circle with a radius of 22.83 meters. Given 60 minutes = 1 degree. ---------- 71=_____m

72. Calculate the value of the 21st pentagonal number. ---------- 72=_____INT.

CONGRUENT CIRCLES

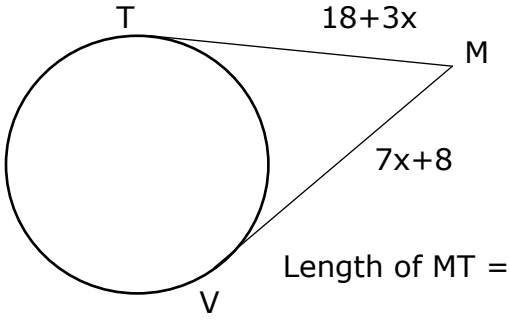
Circumference of one circle = 332



Shaded Area = ?

73=_____

CIRCLE AND TANGENT LINES



Length of MT = ?

74=_____

75. $\frac{\text{Log}(2.3 + 1.32)}{0.823 - 0.566}$ ---------- 75=_____

76. $\frac{\text{Log}(1.58\text{x}10^{7} + 1.01\text{x}10^{7})}{0.649}$ ---------- 76=_____

77. $(15700)10^{(0.854)(7.71)}$ ---------- 77=_____

78. $\frac{\text{Log}[163 + (3.59)(48.3)]}{1.88 + \text{Log}[31 + 64.1]}$ ---------- 78=_____

79. $4 + 6 + 8 + \ldots + 136$ ---------- 79=_____

80. $(0.689) - \frac{(0.689)^2}{2} + \frac{(0.689)^3}{3} - \frac{(0.689)^4}{4}$ ---------- 80=_____

2017-2018 TMSCA Middle School Calculator Test 6 Answer Key

Page 1

1 = 1780
= 1.78×10^{3}

2 = 11.1
= 1.11×10^{1}

3 = -4970
= -4.97×10^{3}

4 = 21.1
= 2.11×10^{1}

5 = -197
= -1.97×10^{2}

6 = -62.4
= -6.24×10^{1}

7 = 4.06
= 4.06×10^{0}

8 = 9.52
= 9.52×10^{0}

9 = 2.15×10^{6}

10 = 6.17×10^{10}

11 = 18.9
= 1.89×10^{1}

12 = 240
= 2.40×10^{2}

13 = 253 INT.

Page 2

14 = -259
= -2.59×10^{2}

15 = 7.46×10^{10}

16 = -60900
= -6.09×10^{4}

17 = -0.861
= -8.61×10^{-1}

18 = 0.545
= 5.45×10^{-1}

19 = -2.68
= -2.68×10^{0}

20 = 236
= 2.36×10^{2}

21 = 3.65
= 3.65×10^{0}

22 = 12.2
= 1.22×10^{1}

23 = 1090
= 1.09×10^{3}

24 = 306 INT.

25 = 7100
= 7.10×10^{3}

26 = 49.3
= 4.93×10^{1}

Page 3

27 = -1.60×10^{-13}

28 = 4.68×10^{-10}

29 = -9030
= -9.03×10^{3}

30 = 2.67×10^{-11}

31 = 3.14
= 3.14×10^{0}

32 = 137
= 1.37×10^{2}

33 = 0.000689
= 6.89×10^{-4}

34 = 172
= 1.72×10^{2}

35 = 3.43
= 3.43×10^{0}

36 = 22 INT.

37 = 22.5
= 2.25×10^{1}

38 = 507000
= 5.07×10^{5}

Page 4

39 = 6.52
= 6.52×10^{0}

40 = 5.62×10^{17}

41 = 2.32×10^{15}

42 = 1.03
= 1.03×10^{0}

43 = 7.16
= 7.16×10^{0}

44 = 2.26×10^{12}

45 = 0.138
= 1.38×10^{-1}

46 = 3.55×10^{7}

47 = -9.65×10^{2918}

48 = 66.0
= 6.60×10^{1}

49 = 2200
= 2.20×10^{3}

50 = 71.0
= 7.10×10^{1}

2017-2018 TMSCA Middle School Calculator Test 6 Answer Key

Page 5

51 = -0.0915
= -9.15×10^{-2}

52 = 1.84×10^{10}

53 = 304
= 3.04×10^{2}

54 = -617
= -6.17×10^{2}

55 = -765
= -7.65×10^{2}

56 = 9.38×10^{-8}

57 = 2.23×10^{-5}

58 = 1.03
= 1.03×10^{0}

59 = 13.9
= 1.39×10^{1}

60 = 0.154
= 1.54×10^{-1}

Page 6

61 = 86.1
= 8.61×10^{1}

62 = 0.815
= 8.15×10^{-1}

63 = 2.82
= 2.82×10^{0}

64 = 13.3
= 1.33×10^{1}

65 = -80.9
= -8.09×10^{1}

66 = 230000
= 2.30×10^{5}

67 = 9.07
= 9.07×10^{0}

68 = -7.42×10^{-5}

69 = 30.9
= 3.09×10^{1}

70 = 0.507
= 5.07×10^{-1}

71 = 8.51
= 8.51×10^{0}

72 = 651 INT.

Page 7

73 = 2400
= 2.40×10^{3}

74 = 25.5
= 2.55×10^{1}

75 = 2.17
= 2.17×10^{0}

76 = 11.4
= 1.14×10^{1}

77 = 6.03×10^{10}

78 = 0.655
= 6.55×10^{-1}

79 = 4690
= 4.69×10^{3}

80 = 0.504
= 5.04×10^{-1}

TMSCA 17-18 MS CA Test #6 Solutions to Word and Geometry Problems

11. The two middle numbers are 5π & 22. Median = $\frac{5\pi+22}{2}$

12. 128 oz = 1 gallon

$$(128)(5)\left(\frac{3}{8}\right)$$

13. Degrees on interior of a polygon: 180(n-2)
A pentagon has 180(5-2) = 540 degrees.
540 – (62+35+78+112)

24.

$$\frac{17\ crickets}{41\ total} = \frac{x}{738}$$

25. The product of the LCM and GCF is just the product of the two numbers. 222(32)

26. Amount 3: x
Amount 2: .15x
Amount 1: .78(.65x)= .507x
Amount 1 is (1-.507) less than Amount 3. .493 = 49.3%

35. 3(8) = 7x

36. D = Q – 63 so Q = D + 63
10D + 25Q = 2345 (cents)
Substitute D + 63 for Q
10D + 25(D+63) = 2345
Solve for D.

37. Base angle =

$$\frac{180-135}{2}$$

38. $C = 2\pi r = 2525$

$$r = \frac{2525}{2\pi}$$

$$A = \pi r^2 = \pi\left(\frac{2525}{2\pi}\right)^2$$

47. Determine that the sign is negative. Then calculate 3224^{832}.

832 [ENTER] 3224 [LOG] [x] [SHOW] *(Look at the digits to the left of the decimal. This gives 2918 for the exponent. Write down 2918.) Then punch* 2918 [–] [10^x] *(This gives 9.65 E0 which is the first part of your answer.*
The answer is **– 9.65x10^{2918}**). *This is done on the HP RPN calculator.*

48. 2400(44) = 1600x

49.

$$\sqrt{1441^2 + 1661^2} = x$$

50.

$$\frac{sinx}{1} = \frac{484}{512}$$

$$x = \text{asin}\left(\frac{484}{512}\right)$$

59.

	R	T	D
Bike	16.8	x	16.8x
Run	9.2	$\frac{7}{3} - x$	$9.2\left(\frac{7}{3} - x\right)$

$$16.8x = 9.2\left(\frac{7}{3} - x\right)$$

Solve for x. Distance is 16.8x

60.

$$\left(\frac{29}{73}\right)\left(\frac{28}{72}\right)$$

61.

$\sqrt{s(s-a)(s-b)(s-c)}$ where $s = \frac{27+12+18}{2}$ and a = 27, b = 12 and c = 18

62. $v\ of\ cube = e^3 = .0501$
So $e = \sqrt[3]{.0501}$

$$SA = 6e^2 = 6\left(\sqrt[3]{.0501}\right)$$

71. $\frac{21\frac{21}{60}}{360}\left(2\pi(22.83)\right)$

72. Pentagonal number

$$\frac{n(3n-1)}{2} = \frac{21(63-1)}{2}$$

73. Circumf of one circle = 332

$$332 = 2\pi r\ so\ r = \frac{332}{2\pi}$$

Area of square – area of circle

$$(2r)^2 - \pi r^2$$

Substitute $\frac{332}{2\pi}$ in for r.

74. 18 + 3x = 7x + 8
x = 2 ½

$$\overline{MT} = 18 + 3x = 18 + 3\left(2\frac{1}{2}\right)$$