8

PLACE LABEL BELOW

Name: _____ School: _____

SS/ID Number: _____ City: _____

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

T M S C A   M I D D L E   S C H O O L

C A L C U L A T O R

T E S T   # 6 ©

D E C E M B E R   5 , 2 0 1 5

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, $1.23(10)^2$, $1.23^.10^2$, $1.230x10^2$, $1.23*10^2$, 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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1. 2490 + 562 --- 1=_____

2. 3.2 + 1.8 + 5.5 --- 2=_____

3. −135 − 96 − 171 -- 3=_____

4. π − 4 − 20 + 16 -- 4=_____

5. 28 − 98 + 16 − 55 -- 5=_____

6. 27.8 − 97.2 − 91.9 + 71.4 + 102 ------------------------------- 6=_____

7. (3.27 + 1.31 − π) − (1.15 + 1.54) ----------------------------- 7=_____

8. 0.783 + 0.689 + 1.13 + 0.39 + 0.774 --------------------------- 8=_____

9. 218 x 123 x 67.5 --- 9=_____

10. 70.1 x 236 x 1690 x 512 ---------------------------------------10=_____

11. One serving of tuna contains 220 calories, one serving of onions contains 40 calories and one serving of celery contains 35 calories. Calculate the number of calories in a tuna salad with 3 servings of tuna, 1 serving of onion and 2 servings of celery. --------------------------11=_____INT.

12. The perimeter of a square is 2158 feet. Calculate the area of the square in square feet. --12=_____ft.^{2}

13. What is forty-two percent of eight-fifths of one billion? --------------13=_____

14. (274/62)[257 − 212] --14=_____

15. (191)[138 x 137 x 137] --15=_____

16. (−60 + 113)[58 − 197 − 44] ---------------------------------------16=_____

17. {−479/381}$\left[\dfrac{333}{161 + 545}\right]$ --17=_____

18. $\left[\dfrac{(10.8 + 37.8)}{15/45}\right]\left[\dfrac{1.17}{0.00404}\right]$ --------------------------------------18=_____

19. $\dfrac{(44/135) + (120/122)}{(0.812 - 0.462)}$ ---19=_____

20. $\dfrac{(1.13\text{x}10^{-4})(1.95\text{x}10^{-4})}{2.82\text{x}10^{-5}}$ (2.42 − 1.26) -------------------------20=_____

21. $\dfrac{(\pi)(20/8)(51/24)}{193}$ ---21=_____

22. $\dfrac{(\pi)(71/180)(157/125)}{(192/74)}$ ---------------------------------------22=_____

23. $\dfrac{[-(2070 + 2470)(1620 - 871)]}{(15.7/(3230))}$ ------------------------------------23=_____

24. The Root Mean Square often abbreviated RMS is a kind of average sometimes used in statistics and engineering. To calculate the RMS of a set of numbers, first find the arithmetic mean of all the squares of the numbers, then take the square root of that result. Calculate the RMS of 22, 83, and 144. --24=_____

25. A train in open country travels 427 miles at an average speed of 68 miles per hour. Through the towns it travels 38 miles at an average speed of 32 miles per hour. Calculate the total trip in hours. ------------25=_____hrs.

26. Angle A and Angle B are supplementary angles. If Angle A is 74.8^{o}, calculate the measure of Angle B in degrees. --------------------------26=_____^{o}

27. $(0.666)\left[(0.0963/0.0883)(0.0149/0.0104)\right]$ ----------------------27=_____

28. $\dfrac{(231-120)(0.319+0.488)}{(8.10 \times 10^{10})}$ ------------------------------------28=_____

29. $\dfrac{(2.94+3.66)(0.904+0.299)}{(4.27 \times 10^{12})}$ ------------------------------------29=_____

30. $\dfrac{(0.0387+0.0247)}{(2.79 \times 10^{11})}$ ------------------------------------30=_____

31. $(4.67)\left[(6.81 \times 10^{9}) - (8.05 \times 10^{9})\right]$ --------------------------------31=_____
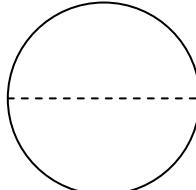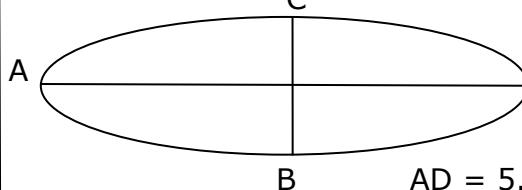
32. $(19.8)\left[\dfrac{10}{(4.29 \times 10^{-7})}\right]$ --------------------------------32=_____

33. $\dfrac{1}{220} - \dfrac{1}{145} + \dfrac{1}{297}$ ------------------------------------33=_____

34. $\dfrac{1}{278} - \dfrac{1}{(310+81.3)}$ ------------------------------------34=_____

35. The volume of a cube is 611 cubic centimeters. Calculate the volume if the length of the edges were halved. ----------------------35=_____cm^3

36. Calculate the slope of the line passing through the points (7, 3) and (-4, 9) on the coordinate plane. -------------------------------------36=_____

CIRCLE	ELLIPSE
Area = 3.0005	C
Diameter = ?	A — D
	B
	AD = 5.21x10^8
	CB = 1.04x10^8
	Area = ?
37=_____	38=_____

39. $\left[\dfrac{5.48}{122}\right](18.5 + 13.1)^2$ ---39=_____

40. $(2.19 + 1.14)^2(158 + 242)^2$ --40=_____

41. $\sqrt{\dfrac{3.13 + 2.59}{729 - 522}}$ ---41=_____

42. $\sqrt{(1910/1570)} + 1.03 - 0.899$ ------------------------------------42=_____

43. $(1/\pi)\sqrt{\dfrac{0.00965 + 0.0133}{1.97 - 0.934}}$ --------------------------------------43=_____
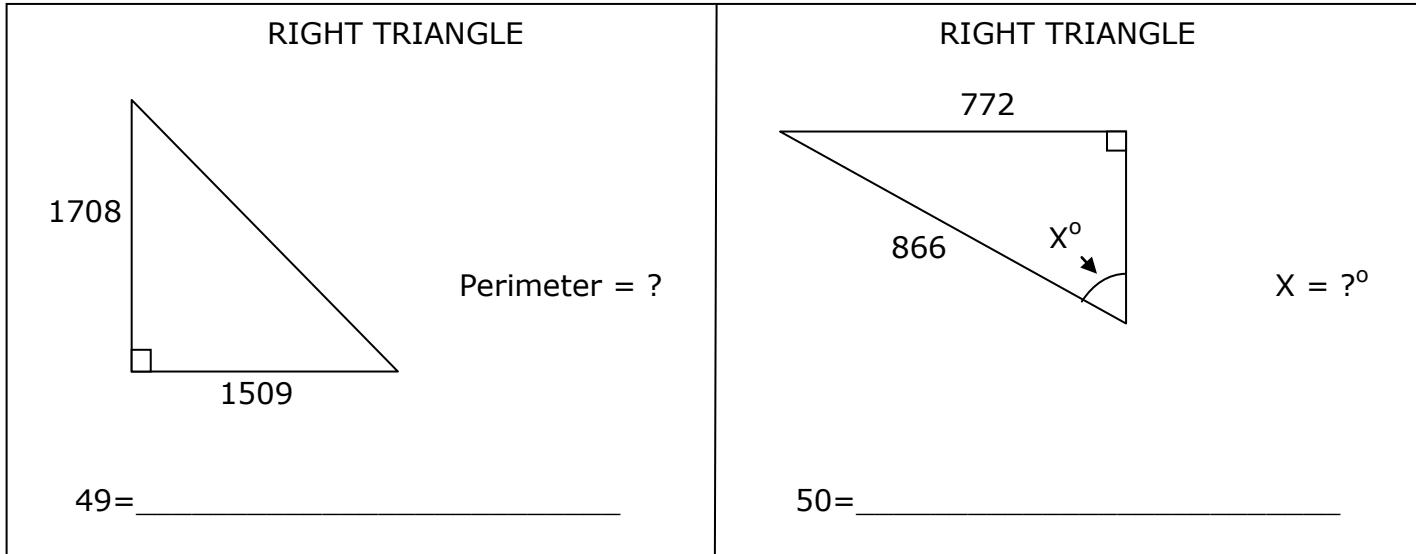
44. $(4630)\sqrt{15300 + 11700 + 2370}$ -------------------------------------44=_____

45. $(158)\sqrt[3]{384 + 260 - 171}$ --------------------------------------45=_____

46. $\left[\sqrt[3]{(304/1370)(64200)}\right]^5$ --46=_____

47. A $2499.99 computer is discounted 22%. If the sales tax is 8.75%,
calculate the total cost of the computer including tax. -----------------47=$_____

48. Calculate the value of 45217 Base 8 in Base 10. --------------------48=_____INT.

RIGHT TRIANGLE	RIGHT TRIANGLE

Left triangle: legs labeled 1708 and 1509, Perimeter = ?

49=_____

Right triangle: hypotenuse 866, top side 772, angle X°, X = ?°

50=_____

51. $\left[\dfrac{166 - 111 + \sqrt{3.46\text{x}10^5/1110}}{-1760 + 2970}\right]^4$ -------------------------------------51=_____

52. $\dfrac{(364 + 393 - 345)^3}{\sqrt{0.265 + 0.0876 + 0.689}}$ -------------------------------------52=_____

53. $\left[\dfrac{\sqrt{\sqrt{0.115 - 0.095}}}{-(0.035 - 0.022)}\right]^3 [1320 + 1320]$ --------------------------------53=_____

54. $\sqrt{\dfrac{(62100)(4.19\text{x}10^5)}{(16300)(21700)}} - 1.97 + 7.98$ ------------------------------54=_____

55. $16800 + \sqrt{(13700)(45200)} - (32500 + 27000)$ -------------------55=_____
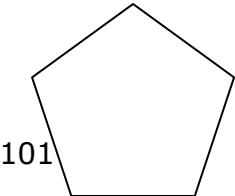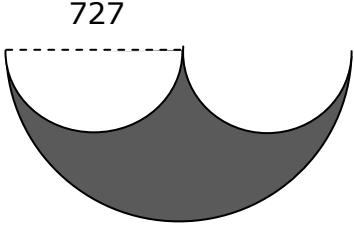
56. $0.395 + \sqrt{(944)/(271)} - (0.9 + 1.16)^2$ ---------------------------56=_____

57. $\sqrt{\dfrac{(43.4)(91)}{(193) + (180)}} + 1/(1.34)^{-4}$ -------------------------------------57=_____

58. $\sqrt{\dfrac{(4340)(14.2)}{(891) + (1090)}} - 21.7$ -------------------------------------58=_____

59. The radius of a right circular cylinder is 0.08 meters. The height of the cylinder is twice the radius. Calculate the total surface area of the cylinder in square meters. ---59=_____m^2

60. Calculate the odds of rolling a standard die and landing on an even number. ---60=_____

REGULAR PENTAGON

101

Area = ?

61=_____

SEMICIRCLES (SMALLER ARE EQUIVALENT)

727

Shaded Area = ?

62=_____

63. $\dfrac{6!/3!}{4! + 6!}$ --63=_____

64. $(3.41\text{x}10^8 - 2.83\text{x}10^8)^{-10}(1.41\text{x}10^8)$ -----------------------------64=_____

65. $(26.7 - \pi)e^{0.733}$ --65=_____

66. (rad) $\dfrac{\tan(6.49)}{3980/1500}$ --66=_____

67. (deg) $[375]\cos(2.98° - 1.81°)$ ------------------------------------67=_____

68. (rad) $\sin[(1.37 - 1.14)(27.7)]$ ---------------------------------------68=_____
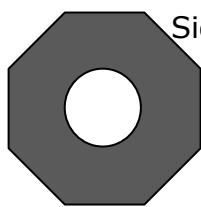
69. (deg) $\dfrac{\cos(126°)}{6000 + 2570}$ ---69=_____

70. $\left[(8.59)\left(\dfrac{2.69}{(1320)(\pi)}\right)\right]^{1/2}$ --70=_____

71. A circular combination lock has 60 numbers on it. A combination has 3 unique numbers and must be done in order. Calculate the number of different combinations for this lock. --------------------------------------71=_____INT.

72. Cindy weighs 84 lbs. and her sister weighs 92 lbs. If Cindy sits 5 ft. from the fulcrum on a seesaw, calculate how far in feet must her sister sit from the fulcrum to balance the seesaw. ---------------------------72=_____ft.

REGULAR OCTAGON AND CIRCLE	INTERSECTING LINES
Side of octagon = Diameter of circle = 8808 Shaded Area = ? 73=_____	$(5x + 6)^o$ $(x - 5)^o$ A^o A^o = ? 74=_____
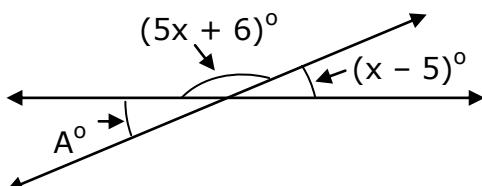
75. $\dfrac{\text{Log}(758 + 902)}{32 - 159}$ --75=_____

76. $\dfrac{(24.4)^{0.757}(5.67)^{0.877}}{(33.5 - 19.7)^{-6}}$ ------------------------------------76=_____

77. $(65900)10^{(0.819)(1.89)}$ -------------------------------------77=_____

78. $\dfrac{(e^{0.668})(e^{0.478})(e^{0.279})}{\text{Ln}(761 + 463)}$ -----------------------------------78=_____

79. $4 + 6 + 8 + ... + 736$ --79=_____

80. $1 + 0.79 + (0.79)^2 + \dfrac{(0.79)^4}{8} - \dfrac{(0.79)^5}{15}$ --------------------------80=_____

2015-2016 TMSCA Middle School Calculator Test #6 Answer Key

Page 1	**Page 2**	**Page 3**	**Page 4**

Page 1

1 = 3050
  = 3.05×10^3

2 = 10.5
  = 1.05×10^1

3 = -402
  = -4.02×10^2

4 = -4.86
  = -4.86×10^0

5 = -109
  = -1.09×10^2

6 = 12.1
  = 1.21×10^1

7 = -1.25
  = -1.25×10^0

8 = 3.77
  = 3.77×10^0

9 = 1.81×10^6

10 = 1.43×10^{10}

11 = 770 INT.

12 = 291000
  = 2.91×10^5

13 = 6.72×10^8

Page 2

14 = 199
  = 1.99×10^2

15 = 4.95×10^8

16 = -9700
  = -9.70×10^3

17 = -0.593
  = -5.93×10^{-1}

18 = 42200
  = 4.22×10^4

19 = 3.74
  = 3.74×10^0

20 = 0.000906
  = 9.06×10^{-4}

21 = 0.0865
  = 8.65×10^{-2}

22 = 0.600
  = 6.00×10^{-1}

23 = -7.00×10^8

24 = 96.8
  = 9.68×10^1

25 = 7.47
  = 7.47×10^0

26 = 105
  = 1.05×10^2

Page 3

27 = 1.04
  = 1.04×10^0

28 = 1.11×10^{-9}

29 = 1.86×10^{-12}

30 = 2.27×10^{-13}

31 = -5.79×10^9

32 = 4.62×10^8

33 = 0.00102
  = 1.02×10^{-3}

34 = 0.00104
  = 1.04×10^{-3}

35 = 76.4
  = 7.64×10^1

36 = -0.545
  = -5.45×10^{-1}

37 = 1.95
  = 1.95×10^0

38 = 4.26×10^{16}

Page 4

39 = 44.9
  = 4.49×10^1

40 = 1.77×10^6

41 = 0.166
  = 1.66×10^{-1}

42 = 1.16
  = 1.16×10^0

43 = 0.0474
  = 4.74×10^{-2}

44 = 793000
  = 7.93×10^5

45 = 1230
  = 1.23×10^3

46 = 8.37×10^6

47 = $2120.62

48 = 19087 INT.

49 = 5500
  = 5.50×10^3

50 = 63.1
  = 6.31×10^1

2015-2016 TMSCA Middle School Calculator Test #6 Answer Key

Page 5	**Page 6**	**Page 7**

Page 5

$51 = 1.30 \times 10^{-5}$

$52 = 6.85 \times 10^{7}$

$53 = -6.39 \times 10^{7}$

$54 = 14.6$
$= 1.46 \times 10^{1}$

$55 = -17800$
$= -1.78 \times 10^{4}$

$56 = -1.98$
$= -1.98 \times 10^{0}$

$57 = 6.48$
$= 6.48 \times 10^{0}$

$58 = -16.1$
$= -1.61 \times 10^{1}$

$59 = 0.121$
$= 1.21 \times 10^{-1}$

$60 = 1.00$
$= 1.00 \times 10^{0}$

Page 6

$61 = 17600$
$= 1.76 \times 10^{4}$

$62 = 415000$
$= 4.15 \times 10^{5}$

$63 = 0.161$
$= 1.61 \times 10^{-1}$

$64 = 3.27 \times 10^{-70}$

$65 = 49.0$
$= 4.90 \times 10^{1}$

$66 = 0.0791$
$= 7.91 \times 10^{-2}$

$67 = 375$
$= 3.75 \times 10^{2}$

$68 = 0.0877$
$= 8.77 \times 10^{-2}$

$69 = -6.86 \times 10^{-5}$

$70 = 0.0746$
$= 7.46 \times 10^{-2}$

$71 = 205320$ INT.

$72 = 4.57$
$= 4.57 \times 10^{0}$

Page 7

$73 = 3.14 \times 10^{8}$

$74 = 24.8$
$= 2.48 \times 10^{1}$

$75 = -0.0254$
$= -2.54 \times 10^{-2}$

$76 = 3.55 \times 10^{8}$

$77 = 2.33 \times 10^{6}$

$78 = 0.585$
$= 5.85 \times 10^{-1}$

$79 = 136000$
$= 1.36 \times 10^{5}$

$80 = 2.44$
$= 2.44 \times 10^{0}$

11. $3(220) + 40 + 2(35)$

12. $\left(\frac{2158}{4}\right)^2$

13. $.42\left(\frac{8}{5}\right)(1 \times 10^9)$

24. $\sqrt{\frac{22^2 + 83^2 + 144^2}{3}}$

25. $\frac{427}{68} + \frac{38}{32}$

26. $180 - 74.8$

35. $611 \div 8$

36. $\frac{9-3}{-4-7} = \frac{6}{-11}$

37. $\pi r^2 = 3.0005$

$r = \sqrt{\frac{3.0005}{\pi}}$

Diameter $= 2\sqrt{\frac{3.0005}{\pi}}$

38.
$\left(\frac{5.21 \times 10^8}{2}\right)\left(\frac{1.04 \times 10^8}{2}\right)\pi$

47. A 22% discount implies that you pay 78%.
$1.0875[.78\,(2499.99)]$
SHOW key to see exact cost.

48.
$4(8^4) + 5(8^3) + 2(8^2) + 1(8) + 7$

49. Hypotenuse =
$\sqrt{(1708)^2 + (1509)^2}$
Perimeter =
$1708 + 1509 +$
$\sqrt{(1708)^2 + (1509)^2}$

50. $\frac{\sin x}{1} = \frac{772}{866}$

$\frac{772}{866}$ asin

59. $2\pi rh + 2\pi r^2 = SA$
$2\pi(.08)(.16) + 2\pi(.08)^2$

60. 3 numbers are even and 3 are odd. The odds of landing on an even $= \frac{3}{3}$

61. Great formula for area of any regular polygon:
$$\frac{perimeter^2}{tan\left(\frac{180}{n}\right)4n}$$
Where n = number of sides.
$$\frac{[5(101)]^2}{tan\left(\frac{180}{5}\right)4(5)}$$

62. $\frac{727^2\pi}{2} - \left(\frac{727}{2}\right)^2\pi$

71. Assuming that numbers may not be repeated:
$(60)(59)(58)$ OR
Permutations of 60 items, choose 3.
$\frac{n!}{(n-r)!} = \frac{60!}{(60-3)!}$ SHOW

72. $(wt_1)(d_1) = (wt_2)(d_2)$
$84(5) = 92x$
$x = \frac{84(5)}{92}$

73. See # 61 for formula of regular polygon
$$\frac{[8(8808)]^2}{tan\left(\frac{180}{8}\right)4(8)}$$
$$-\left(\frac{8808}{2}\right)^2\pi$$

74. $5x + 6 + x - 5 = 180$
$6x = 179$ so $x = \frac{179}{6}$

$A = x - 5 =$
$$\frac{179}{6} - 5$$