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   # 8 ©

J A N U A R Y   2 0 ,   2 0 1 8

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.

1. 697 + 2900 --- 1=_____

2. 57 − 62 + 16 --- 2=_____

3. 45 + 48 − 44 --- 3=_____

4. 19 + π − 17 − 22 --- 4=_____

5. 280 + 477 − 570 − 721 ------------------------------------ 5=_____

6. 61.7 + 21.9 − 98.5 − 182 − 108 -------------------------- 6=_____

7. 0.701 − 1.63 + 1.34 − 1.54 − 1.39 ---------------------- 7=_____

8. −2.21 + 0.887 + 0.519 + 1.27 + 2.21 ------------------- 8=_____

9. 712 x 219 x 133 --- 9=_____

10. 191 x 185 x 1020 x 4790 -------------------------------- 10=_____

11. A pole casts a 14 meter shadow. Nate is 2 meters tall and casts a shadow 3.21 meters long. Calculate how tall the pole is in meters. 11=_____m

12. There are 105 students in the band. Seven-fifteenths of the band members are girls. Calculate how many of the band members are boys. --- 12=_____INT.

13. The length of the gym is 5 times the width. The length is 240 ft. Calculate the width of the gym in feet. -------------------------- 13=_____ft.

14. $(131/545)[623 - 128]$ ------------------------------------ 14=_____

15. $-64/[222 \times 238 \times 183]$ ------------------------------------ 15=_____

16. $\left[\dfrac{-286}{430}\right][(73/142) + 0.382]$ ------------------------------ 16=_____

17. $\left[\dfrac{44}{89}\right][(152/182) - 0.616]$ ---------------------------------- 17=_____

18. $\dfrac{(65/23) + (103/192)}{(99.9 - 55.3)}$ ------------------------------------ 18=_____

19. $\left[\dfrac{232/209}{141/191}\right]\{41.7 + 44.6 - 107\}$ ------------------------- 19=_____

20. $(17.2)[30/128 \times 268/219] - 2.85$ ------------------------ 20=_____

21. $\dfrac{501}{(406 - 160)} - \dfrac{(303 - 292)}{217}$ ---------------------------------- 21=_____

22. $\dfrac{[-(716 + 895)(264 - 754)]}{(2.17 \times 10^{-4}/(0.0344))}$ ------------------------------ 22=_____

23. $\left[\dfrac{4430 + 2810}{1530 - 5620}\right]\left[\dfrac{3950}{1380}\right]$ ------------------------------------ 23=_____

24. Calculate the cost of a new $24,989 car with a 7.25% sales tax. - 24$_____

25. Randy works at a feed store for $11.85 per hour. He works 8
    hours Monday – Friday and then 4 hours of overtime on Saturday
    at 1.5 times pay. Calculate his pay for the week. --------------- 25$_____

26. Sarah recorded her daily quiz scores for three weeks.
    9, 9, 10, 10, 8, 9, 10, 9, 8, 7, 10, 9, 9, 8, 9 Calculate the mode
    for this 3 weeks. --- 26=_____INT.

27. $\dfrac{(101 + 21.8)(1.87 + \pi)}{(1.78 \times 10^{11})}$ ----------------------------------- 27=_____

28. $\dfrac{(2.14 \times 10^{10}) + (9.07 \times 10^{9})}{(-0.0108)(0.012) - 7.28 \times 10^{-5}}$ ------------------------- 28=_____

29. $\dfrac{(0.251 - 0.308)(59.6 + 11)}{(1.96 \times 10^{12})}$ ------------------------------ 29=_____

30. $\dfrac{1}{0.766} + \dfrac{1}{(\pi)(0.552 - 0.244)}$ ------------------------- 30=_____

31. $(7.4)\left[(1.12 \times 10^{-7}) - (1.52 \times 10^{-7})\right]$ --------------------- 31=_____
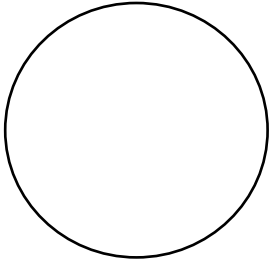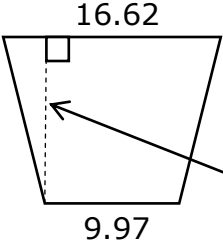
32. $\dfrac{1}{17} + \dfrac{1}{(27.1 - 10.9)}$ ----------------------------------- 32=_____

33. $1/(0.016 - 0.00677) - 1/(0.00681)$ --------------------- 33=_____

34. $\left[\dfrac{1/600}{1/160}\right] + [0.157]$ ------------------------------------- 34=_____

35. Glenn's Shoe Store has a BOGO sale going on. Buy one pair of shoes and get one of equal or lesser value at half price. Ann wants to purchase two pairs of shoes originally priced at $89.98 and $106.99. Calculate the cost of the two pairs of shoes if they are purchased at the BOGO sale, not including tax.   ------------- 35=$_____

36. Larry can load the pallet in one hour, Mo can load the pallet in 0.8 hour and Curly can load the pallet in 1.2 hours. Calculate the time to load the pallet if they all work together. ------------- 36=_____hrs.

CIRCLE	TRAPEZOID
Circumference = 1023	16.62
	Area = 127.1
Area = ?	9.97 Height = ?
37=_____	38=_____

39. $\dfrac{(13200 + 2850)^3}{(0.113 - 0.366)^2}$ -- 39=_____

40. $(1 + 1.58 + 0.672)^2(4.86 + 5.39)^2$ ---------------------- 40=_____

41. $\left[\dfrac{363}{39.5}\right](156 + 192)^3$ ------------------------------------ 41=_____

42. $\sqrt{(55.8/22.8) + 1.94 - 1.44}$ ------------------------------ 42=_____

43. $(89.4)\sqrt{113 + 64.8 + 87.3}$ ------------------------------ 43=_____

44. $\sqrt{96.7 - 33.9 + 38.8} - \sqrt{50.2}$ ---------------------------- 44=_____

45. $(21400)\sqrt{226 + 246 - 33.6}$ ------------------------------ 45=_____

46. $\sqrt[3]{1.87 - 382/699} + 1/\sqrt{0.256 + 0.111}$ ------------------ 46=_____

47. Calculate 964^{-469}. -- 47=_____

48. A group of 40 coins is worth $4.90 consists of only dimes and
quarters. Calculate the number of dimes in the group. ---------- 48=_____INT.

RIGHT TRIANGLE	RIGHT TRIANGLE

RIGHT TRIANGLE

X   0.081

0.072   X = ?

49=_____

RIGHT TRIANGLE

3.51   57°

X

X = ?

50=_____
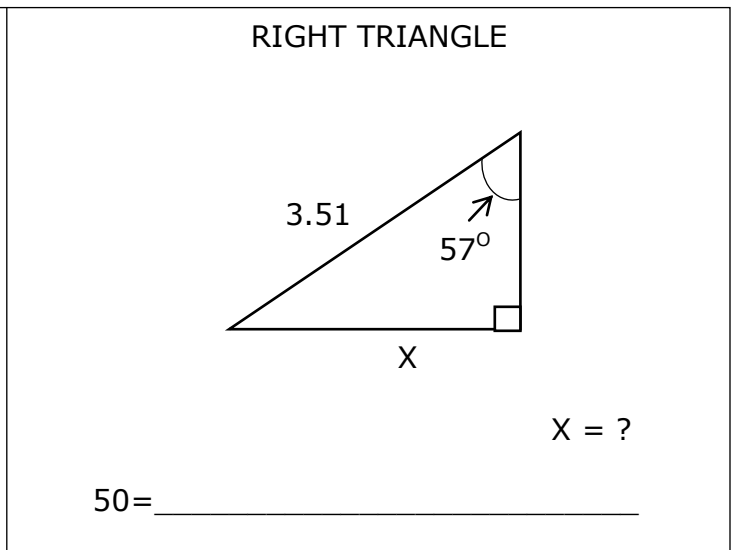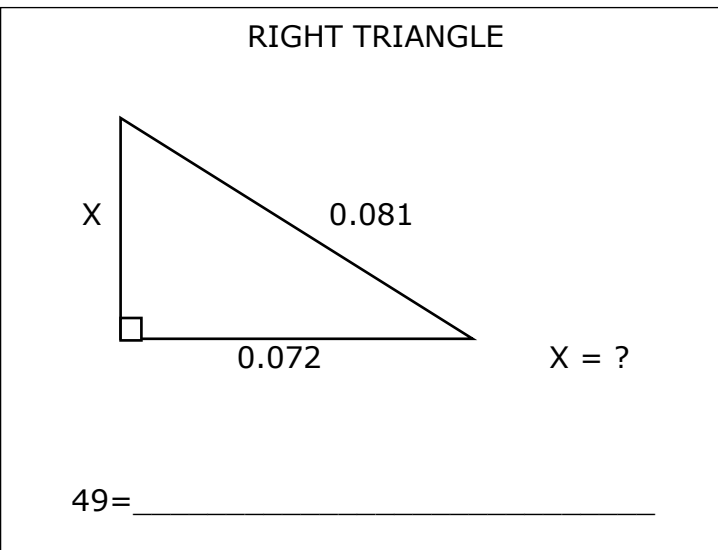
51. $$\dfrac{(51100 + 3.98\text{x}10^5 - 2.37\text{x}10^5)^4}{\sqrt{1.90\text{x}10^5 + 1.08\text{x}10^5 + 1.30\text{x}10^5}}$$ ---------------------- 51=_____

52. $$\left[\dfrac{22200 + 15900 + \sqrt{7.88\text{x}10^8 + 3.93\text{x}10^8}}{34300/12300}\right]^2$$ ------------ 52=_____

53. $$\sqrt{\dfrac{2.32\text{x}10^9}{(99900)(0.124)}} + \dfrac{(3520 - 5180)}{(0.616 + 2.3)}$$ ---------------------- 53=_____

54. $$2620 + \sqrt{(1750)(4960)} - (3630 + 2850)$$ ----------------- 54=_____

55. $$\sqrt{\dfrac{(42000)(12300)}{(4170)(4.30\text{x}10^5)}} - 0.241 + 0.465$$ ------------------- 55=_____
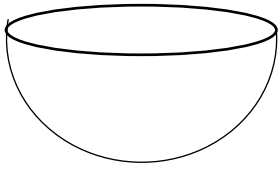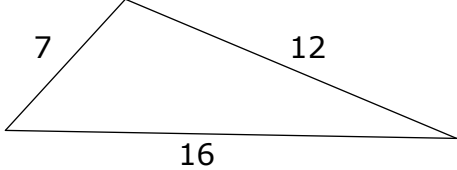
56. $$2.92 + \sqrt{(3250)/(325)} - (0.899 + 0.536)^2$$ --------------- 56=_____

57. $$\sqrt{\dfrac{1/(1700 - 1140)}{(2500)(39.5 + 109)^5}}$$ ------------------------------------- 57=_____

58. $$\sqrt{\dfrac{(68.3)(740)}{(81.4) + (26.2)}} + 1/(0.0462)^1$$ ------------------------ 58=_____

59. A canoe travels 15 miles downstream in 4 hours. In the same time
it can travel 9 miles upstream. Calculate the rate of the current
in miles per hour. --- 59=_____mph.

60. Calculate the odds of rolling a sum of 7 on a pair of dice. -------- 60=_____

HEMISPHERE	SCALENE TRIANGLE

HEMISPHERE

Volume = 9217

Diameter = ?

61=_____

SCALENE TRIANGLE

7   12

16

Area = ?

62=_____

63. $\dfrac{27!/22!}{6! + 8!}$ --- 63=_____

64.   (deg) $(204 - 298)\sin(152°)$ ------------------------------- 64=_____

65. $(3.59 \times 10^7 - 3.05 \times 10^7)^4(94100)$ ------------------------- 65=_____

66.   (rad) $\sin\left[\dfrac{(4.51)(\pi)}{(16.9)(1.3)}\right]$ ------------------------------------ 66=_____

67.   (deg) $(526 - 549)\tan(0.989°) + 0.196$ ------------------- 67=_____
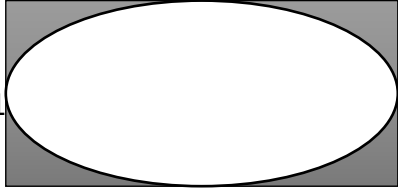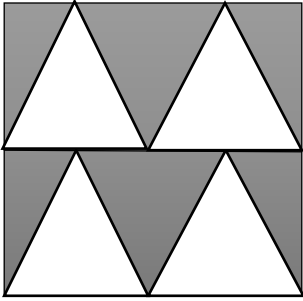
68.   (deg) $\dfrac{\sin(37.9°)}{\tan(37.9°)}[20.7]$ ------------------------------------ 68=_____

69.   (deg) $\dfrac{\tan(78.3°)}{1500 + 1740}$ ------------------------------------ 69=_____

70. $(629 - 714)e^{\pi} - 0.304$ ------------------------------------ 70=_____

71.   The volume of a right circular cylinder is 27925 ft³. Calculate the length of the radius, if the height is 57 feet.   -------------------- 71=_____ft.

72.   Calculate the height of an equilateral triangle if a side measures 1911.91 inches.   --- 72=_____in.

| RECTANGLE AND ELLIPSE	SQUARE AND EQUIVALENT ISOSCELES TRIANGLES

RECTANGLE AND ELLIPSE

521

231

Shaded Area =?

73=_____

SQUARE AND EQUIVALENT ISOSCELES TRIANGLES

355

Shaded Area = ?

74=_____

75. $\dfrac{Log(448 + 1480)}{6.93 - 10.8}$ --- 75=_____

76. $\dfrac{(4.24)^{0.955}(24.9)^{0.841}}{(7.59 - 4.75)^{-10}}$ ----------------------------------- 76=_____

77. $\dfrac{4350 - 15300}{Log(13800 + 12000)}$ -- 77=_____

78. $(3.73)^{\pi}(0.0351)^{3}(0.0842 - 0.0806)^{4}$ --------------------- 78=_____

79. $1 + 3 + 5 + ... + 223$ --- 79=_____

80. $1 + (0.86) + \dfrac{(0.86)^{2}}{2} + \dfrac{(0.86)^{3}}{6} + \dfrac{(0.86)^{4}}{24}$ ---------------- 80=_____

2017-2018 TMSCA Middle School Calculator Test 8 Answer Key

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

Page 1

1 = 3600
= 3.60×10^3

2 = 11.0
= 1.10×10^1

3 = 49.0
= 4.90×10^1

4 = -16.9
= -1.69×10^1

5 = -534
= -5.34×10^2

6 = -305
= -3.05×10^2

7 = -2.52
= -2.52×10^0

8 = 2.68
= 2.68×10^0

9 = 2.07×10^7

10 = 1.73×10^{11}

11 = 8.72
= 8.72×10^0

12 = 56 INT.

13 = 48.0
= 4.80×10^1

Page 2

14 = 119
= 1.19×10^2

15 = -6.62×10^{-6}

16 = -0.596
= -5.96×10^{-1}

17 = 0.108
= 1.08×10^{-1}

18 = 0.0754
= 7.54×10^{-2}

19 = -31.1
= -3.11×10^1

20 = 2.08
= 2.08×10^0

21 = 1.99
= 1.99×10^0

22 = 1.25×10^8

23 = -5.07
= -5.07×10^0

24 = $26800.70

25 = $545.10

26 = 9 INT.

Page 3

27 = 3.46×10^{-9}

28 = -1.51×10^{14}

29 = -2.05×10^{-12}

30 = 2.34
= 2.34×10^0

31 = -2.96×10^{-7}

32 = 0.121
= 1.21×10^{-1}

33 = -38.5
= -3.85×10^1

34 = 0.424
= 4.24×10^{-1}

35 = $151.98

36 = 0.324
= 3.24×10^{-1}

37 = 83300
= 8.33×10^4

38 = 9.56
= 9.56×10^0

Page 4

39 = 6.46×10^{13}

40 = 1110
= 1.11×10^3

41 = 3.87×10^8

42 = 1.72
= 1.72×10^0

43 = 1460
= 1.46×10^3

44 = 2.99
= 2.99×10^0

45 = 448000
= 4.48×10^5

46 = 2.75
= 2.75×10^0

47 = 2.94×10^{-1400}

48 = 34 INT.

49 = 0.0371
= 3.71×10^{-2}

50 = 2.94
= 2.94×10^0

2017-2018 TMSCA Middle School Calculator Test 8 Answer Key

Page 5	Page 6	Page 7

Page 5

$51 = 3.09 \times 10^{18}$

$52 = 6.75 \times 10^{8}$

$53 = -137$
$= -1.37 \times 10^{2}$

$54 = -914$
$= -9.14 \times 10^{2}$

$55 = 0.761$
$= 7.61 \times 10^{-1}$

$56 = 4.02$
$= 4.02 \times 10^{0}$

$57 = 3.14 \times 10^{-9}$

$58 = 43.3$
$= 4.33 \times 10^{1}$

$59 = 0.750$
$= 7.50 \times 10^{-1}$

$60 = 0.200$
$= 2.00 \times 10^{-1}$

Page 6

$61 = 32.8$
$= 3.28 \times 10^{1}$

$62 = 38.9$
$= 3.89 \times 10^{1}$

$63 = 236$
$= 2.36 \times 10^{2}$

$64 = -44.1$
$= -4.41 \times 10^{1}$

$65 = 8.00 \times 10^{31}$

$66 = 0.601$
$= 6.01 \times 10^{-1}$

$67 = -0.201$
$= -2.01 \times 10^{-1}$

$68 = 16.3$
$= 1.63 \times 10^{1}$

$69 = 0.00149$
$= 1.49 \times 10^{-3}$

$70 = -1450$
$= -1.45 \times 10^{3}$

$71 = 12.5$
$= 1.25 \times 10^{1}$

$72 = 1660$
$= 1.66 \times 10^{3}$

Page 7

$73 = 25800$
$= 2.58 \times 10^{4}$

$74 = 63000$
$= 6.30 \times 10^{4}$

$75 = -0.849$
$= -8.49 \times 10^{-1}$

$76 = 2.03 \times 10^{6}$

$77 = -2480$
$= -2.48 \times 10^{3}$

$78 = 4.54 \times 10^{-13}$

$79 = 12500$
$= 1.25 \times 10^{4}$

$80 = 2.36$
$= 2.36 \times 10^{0}$

11. $\frac{x}{14} = \frac{2}{3.21}$ so $x = \frac{2(14)}{3.21}$

12. $\frac{8}{15}$ are boys. $\frac{8}{15}$ (105)

13. Length = $\frac{240}{5}$

24. $24989(1.0725)

25. 40(11.85) + 4(1.5)(11.85)

26. Mode is the number that appears most frequently. 9

35. 106.99 + ½ (89.98)

36.

	Work Rate	Time	Part of work done
Larry	1	X	**1x**
Mo	**1/.8**	X	**(1/.8)x**
Curly	**1/1.2**	X	**(1/1.2)x**

The work rate is the fraction of the job that can be done in one hour. The "Part of work done" is the fraction of the complete job each man does in x hours.
A complete job = 1
$$1x + \frac{1}{.8}x + \frac{1}{1.2}x = 1\ job$$
$$x = \frac{1}{\left(1 + \frac{1}{.8} + \frac{1}{1.2}\right)}$$

37. C = 2πr, so r = $\frac{C}{2\pi}$
Area = πr^2 $A = \left(\frac{1023}{2\pi}\right)^2$

38. $127.1 = \frac{1}{2}[(16.62 + 9.97)h]$
$$h = \frac{127.1(2)}{(16.62 + 9.97)}$$

47. -468 [ENTER] 964 [LOG] [x]

[SHOW] *(Look at the digits to the left of the decimal. This gives -1399 for the exponent. Write down -1399.) Then punch*

-1399 [–] [10ˣ]

*(This gives 2.94 E -1. 2.94 is the first part of your answer. Since you have E -1, you have to add negative 1 to negative 1399.
The answer is **2.94 x 10⁻¹⁴⁰⁰**). This is done on the HP RPN calculator.*

48. D + Q = 40
.1D + .25Q = $4.90 or
10D + 25Q = 490
-25D – 25Q = -1000
   -15D = -510, so D = 34

49. $\sqrt{.081^2 - .072^2}$

50. $\frac{\sin 57}{1} = \frac{x}{3.51}$ so
$$x = 3.51(\sin 57)$$

59. Use $r = \frac{d}{t}$
b = canoe rate
c = current rate

	Rate	Time	dist
down	b + c	4	15
up	b - c	4	9

$b + c = \frac{15}{4}$; $b - c = \frac{9}{4}$
Solve the system. 2c = 6/4 so c = .750

60.
There are 6 ways to roll a 7 and 30 ways to not roll a 7.
$$\frac{6}{30}$$

61. $9217 = \frac{2}{3}\pi r^3$
$$r = \sqrt[3]{\frac{9217(3)}{2\pi}}$$
Double this answer for the diameter.

62.
$\sqrt{s(s-a)(s-b)(s-c)}$ where s = semiperimeter
$$s = \frac{7 + 12 + 16}{2} = 17.5$$
Substitute 17.5 for s and 7,12,16 for a,b,c.

71. $V = \pi r^2 h$;
$$27925 = \pi r^2 (57)$$
$$r = \sqrt{\frac{27925}{57\pi}}$$

72. h= $\frac{side}{2}\sqrt{3} = \frac{1911.91}{2}\sqrt{3}$

73. Area of rectangle minus area of ellipse
$$521(231) - \left(\frac{521}{2} \cdot \frac{231}{2}\right)\pi$$

74. The 4 white triangles = sum of the shaded triangles so the shaded area = ½ the area of the square.
$$\frac{355^2}{2}$$