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 # 1 1 ©

F E B R U A R Y 1 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.
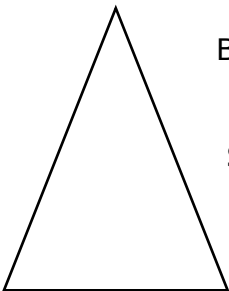
2017-2018 TMSCA Middle School Calculator Test 11

1.   −4390 + 2620 -- 1=_____

2.   13 + 32 + 50 -- 2=_____

3.   141 + 187 + 126 --- 3=_____

4.   26 − 12 − 22 + 22 -- 4=_____

5.   1700 − 934 − 1850 − 1470 --------------------------- 5=_____

6.   81.6 + 161 − 111 − 180 + 112 --------------------------- 6=_____

7. $(−0.804 − 1.54) + (2.75 − \pi − 2.41)$ ---------------------- 7=_____

8.   0.402 + 0.187 + 0.637 + 0.851 + 0.268 ------------------ 8=_____

9.   580 x 267 x 299 --- 9=_____

10.   197 x 3280 x 707 x 623 ----------------------------------- 10=_____

11. The length of a model car is 5% of the length of the actual car. The model is 1.25 feet long. Calculate the length of the actual car. -- 11=_____ft.

12. Calculate the value of pi to the twelfth power divided by twelve to the power of pi. --- 12=_____

13. Troy is at school one-third of a day, does homework one-fifteenth of a day, sleeps three-eighths of a day and spends 2 hours playing video games. Calculate how much time is left of a day. --------- 12=_____hrs.

14. $(65/39)[20 - 110]$ --- 14=_____

15. $(552)[298 \times 131 \times 627]$ ------------------------------------ 15=_____

16. $\left[\dfrac{-176}{73}\right][(50/195) - 0.119]$ ------------------------------- 16=_____

17. $\{346/709\}\left[\dfrac{619}{798 + 437}\right]$ ------------------------------------ 17=_____

18. $\dfrac{(136/143) + (81/161)}{(58.2 - 94)}$ ------------------------------------- 18=_____

19. $\left[\dfrac{(8.90\times10^{-4} + 0.00296)}{277/216}\right]\left[\dfrac{0.0364}{0.0574}\right]$ ------------------------ 19=_____

20. $(0.252)[514/420 \times 470/406] - 0.329$ -------------------- 20=_____

21. $\dfrac{(\pi)(15/10)(32/16)}{625}$ ------------------------------------- 21=_____

22. $\dfrac{(16.3 + 8.37 - 17)}{\{(0.00402 - 0.00352)/(1430)\}}$ -------------------------- 22=_____

23. $\left[\dfrac{3040 + 2510}{2290 - 2510}\right]\left[\dfrac{1760}{1260}\right]$ ------------------------------------ 23=_____

24. Matt got a $50 gift card for his birthday. He ordered an item on-line
    that cost $37.99. There is 8.75% sales tax and 12% shipping
    charge added after tax. Calculate the amount left on his
    gift card. --- 24=$_____

25. A 30-60-90 triangle has a hypotenuse of 33.8 inches. Calculate
    the area of the triangle in square inches. ------------------------ 25=_____in^2.

26. A comic book store sells 1,829 comics in the month of January.
    Calculate their average daily comic sales in the month of
    January. --- 26=_____INT.

27. $$\frac{(0.0383 + 0.0793)(0.0256 + 0.0265)}{(1.71 \times 10^{11})}$$ ------------------- 27=_____

28. $[1340 - (1080 + 1880)] + [(-0.197)(2220 - 704)]$ ------ 28=_____

29. $(0.132)[(3.33/4.75)(169/150)]$ -------------------------- 29=_____

30. $(20.2)[(2.73 \times 10^{12}) - (1.94 \times 10^{12})]$ -------------------- 30=_____

31. $$\frac{1}{\pi} + \frac{1}{(\pi)(68.5 - 75.3)}$$ -- 31=_____

32. $$\frac{1}{0.0508} + \frac{1}{(0.247 - 0.223)}$$ -------------------------------- 32=_____

33. $$\frac{1}{453} - \frac{1}{(234 + 383)}$$ --------------------------------------- 33=_____

34. $$\frac{1}{1150} - \frac{1}{2060} + \frac{1}{2580}$$ ------------------------------------ 34=_____

35. A set contains the first 8 prime numbers. Calculate the median of
     this set. --- 35=_____

36. A beverage container in the shape of a cylinder has a diameter
     of 10 cm and a height of 13 inches. Calculate the number of
     mL the container can hold. -------------------------------------- 36=_____mL

RECTANGLE	ISOSCELES TRIANGLE
0.0529 Area = 0.00753 Length = ?	Base = 92.5 Side = 109.3 Area = ?
37=_____	38=_____

39. $\dfrac{(8650 + 17900)^2}{(0.0204 - 0.0211)^3}$ --- 39=_____

40. $\left[\dfrac{2180}{3270}\right](13.3 + 23.1)^4$ ------------------------------------- 40=_____

41. $\left[\dfrac{2880 + (1/(2.44\text{x}10^{-4}))}{(2370/2110) - 1.1}\right]^2$ ----------------------------- 41=_____

42. $\sqrt{53.4} + \sqrt{37.3 + 50} - (\pi)\sqrt{35.7}$ ------------------------ 42=_____
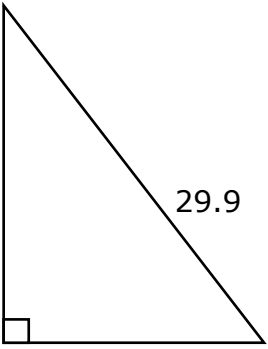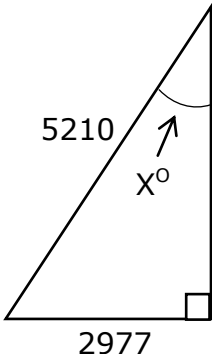
43. $\sqrt{28300 - 9370 + 11000} - \sqrt{16700}$ --------------------- 43=_____

44. $\sqrt{(30.9/41.2) + 0.492 - 0.444}$ --------------------------- 44=_____

45. $\sqrt[4]{0.758 - 233/380} + 1/\sqrt{1770 + 1670}$ ------------------- 45=_____

46. $(551)\sqrt[4]{4210 + 4630 - 3840}$ ------------------------------ 46=_____

47. Convert 3144 ounces to milliliters. ------------------------------- 47=_____ _____mL

48. Calculate the value of 54321 Base 6 in Base 10. ----------------- 48=_____INT

RIGHT TRIANGLE	RIGHT TRIANGLE
25.9 29.9 Area = ?	5210 X° 2977 X° = ?
49=_____	50=_____

51. $\dfrac{(44.4 + 44 - 15)^3}{\sqrt{0.205 + 0.297 + 0.241}}$ ----------------------------------- 51=_____

52. $\left[\dfrac{359 + 197 + \sqrt{2.41 \times 10^5 + 2.62 \times 10^5}}{12.3/14.9}\right]^4$ ----------------- 52=_____

53. $\left[\dfrac{\sqrt{\sqrt{1.79 \times 10^5 - 1.48 \times 10^5}}}{-(3.98 - 5.07)}\right]^2 [56900 + 1.09 \times 10^5]$ --------- 53=_____

54. $(1.62)^2 \sqrt{(109)/(5.07)} - (11.8 + 3.89)$ ------------------- 54=_____

55. $\sqrt{\dfrac{(11000)(2.04 \times 10^5)}{(22000)(86700)}} - 0.214 + 0.986$ ------------------ 55=_____
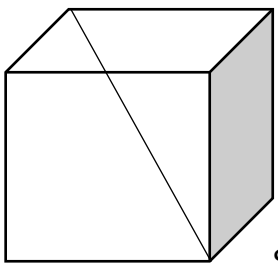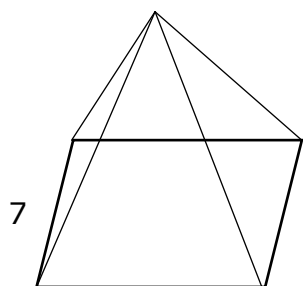
56. $(2.96)(2.02 \times 10^8)^{1/4} - [(58700)(3.95 \times 10^5)]^{1/4}$ ---------- 56=_____

57. $\sqrt{\dfrac{(6.37)(305)}{(763) + (366)}} - 3.55$ ------------------------------------ 57=_____

58. $(\text{deg}) \sin(3180°) + (22.4/18.3)$ -------------------------- 58=_____

59. Calculate the sum of the complement and twice the supplement
    of an angle measuring 72.69°. ------------------------------------- 59=_____°

60. Calculate the slope of the line perpendicular to the line passing
    through (3,8) and (-10,7) on the coordinate plane. ------------- 60=_____

CUBE	SQUARE BASED PYRAMID
Inner Diagonal = 498.23 Surface Area = ? 61=_____	Volume = 120 7 Height = ? 62=_____

63. $\dfrac{31! + 33!}{18!}$ -- 63=_____

64. (deg) $(22.1 - 18.9)\tan(19.4°)$ ----------------------------- 64=_____

65. (deg) $\dfrac{\cos(8.56°)}{70.3}$ --- 65=_____

66. (deg) $(31600 - 14200)\sin(15.8°) + 4390$ ----------------- 66=_____

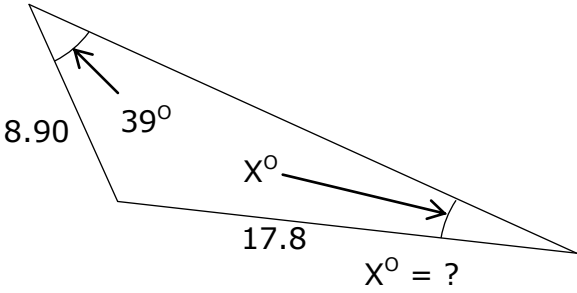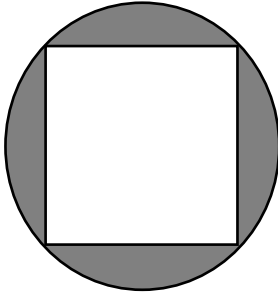67. (rad) $\sin\left[\dfrac{(74.5)(\pi)}{(23.5)(1.43)}\right]$ ------------------------------------- 67=_____

68. (rad) $(54700)\tan(13)$ --------------------------------------- 68=_____

69. (deg) $\dfrac{\sin(27.3°)}{1.18 + 0.286}$ ------------------------------------- 69=_____

70. $(11.6 + 9.57 + 7.39)^{2/5}$ ---------------------------------- 70=_____

71. Calculate how many different 7 digit phone numbers can be made
using the digits 0 – 9 inclusive. Repetition is allowed but the first
digit can not be 0. -- 71=_____

72. Calculate the odds of not drawing a face card out of a standard
deck of cards. -- 72=_____

SCALENE TRIANGLE	CIRCLE AND SQUARE
8.90 39° 17.8 X^{o} X^{o} = ?	Perimeter of Square = 245.9 Shaded Area = ?
73=_____	74=_____

75. $Ln\left[\dfrac{124 + 94.2 + 124}{168 + 197 - 117}\right]$ -- 75=_____

76. $\dfrac{Log(7.33\text{x}10^{6} + 1.52\text{x}10^{7})}{0.216}$ -------------------------------- 76=_____

77. $Log\sqrt{\dfrac{21 - 9.45}{(101)(224)}}$ -- 77=_____

78. $\dfrac{Log[1110 + (22.5)(87)]}{0.521 + Log[4.15 + 1.46]}$ -------------------------------- 78=_____

79. $1 + 3 + 5 + ... + 441$ ------------------------------------ 79=_____

80. $\dfrac{1}{(0.89)} + \dfrac{1}{3(0.89)^{3}} + \dfrac{1}{5(0.89)^{5}} + \dfrac{1}{7(0.89)^{7}}$ ------------ 80=_____

2017-2018 TMSCA Middle School Calculator Test 11 Answer Key

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

Page 1

1 = -1770
  = -1.77×10^3

2 = 95.0
  = 9.50×10^1

3 = 454
  = 4.54×10^2

4 = 14.0
  = 1.40×10^1

5 = -2550
  = -2.55×10^3

6 = 63.6
  = 6.36×10^1

7 = -5.15
  = -5.15×10^0

8 = 2.35
  = 2.35×10^0

9 = 4.63×10^7

10 = 2.85×10^{11}

11 = 25.0
  = 2.50×10^1

12 = 376
  = 3.76×10^2

13 = 3.40
  = 3.40×10^0

Page 2

14 = -150
  = -1.50×10^2

15 = 1.35×10^{10}

16 = -0.331
  = -3.31×10^{-1}

17 = 0.245
  = 2.45×10^{-1}

18 = -0.0406
  = -4.06×10^{-2}

19 = 0.00190
  = 1.90×10^{-3}

20 = 0.0280
  = 2.80×10^{-2}

21 = 0.0151
  = 1.51×10^{-2}

22 = 2.19×10^7

23 = -35.2
  = -3.52×10^1

24 = $3.73

25 = 247
  = 2.47×10^2

26 = 59 INT.

Page 3

27 = 3.58×10^{-14}

28 = -1920
  = -1.92×10^3

29 = 0.104
  = 1.04×10^{-1}

30 = 1.60×10^{13}

31 = 0.271
  = 2.71×10^{-1}

32 = 61.4
  = 6.14×10^1

33 = 0.000587
  = 5.87×10^{-4}

34 = 0.000772
  = 7.72×10^{-4}

35 = 9.00
  = 9.00×10^0

36 = 2590
  = 2.59×10^3

37 = 0.142
  = 1.42×10^{-1}

38 = 4580
  = 4.58×10^3

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39 = -2.06×10^{18}

40 = 1.17×10^6

41 = 9.03×10^{10}

42 = -2.12
  = -2.12×10^0

43 = 43.8
  = 4.38×10^1

44 = 0.893
  = 8.93×10^{-1}

45 = 0.634
  = 6.34×10^{-1}

46 = 4630
  = 4.63×10^3

47 = 93000
  = 9.30×10^4

48 = 7465 INT.

49 = 193
  = 1.93×10^2

50 = 34.8
  = 3.48×10^1

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

Page 5

51 = 459000
   = 4.59×10^5

52 = 5.52×10^{12}

53 = 2.46×10^7

54 = -3.52
   = -3.52×10^0

55 = 1.86
   = 1.86×10^0

56 = -37.3
   = -3.73×10^1

57 = -2.24
   = -2.24×10^0

58 = 0.358
   = 3.58×10^{-1}

59 = 232
   = 2.32×10^2

60 = -13.0
   = -1.30×10^1

Page 6

61 = 496000
   = 4.96×10^5

62 = 7.35
   = 7.35×10^0

63 = 1.36×10^{21}

64 = 1.13
   = 1.13×10^0

65 = 0.0141
   = 1.41×10^{-2}

66 = 9130
   = 9.13×10^3

67 = 0.630
   = 6.30×10^{-1}

68 = 25300
   = 2.53×10^4

69 = 0.313
   = 3.13×10^{-1}

70 = 3.82
   = 3.82×10^0

71 = 9000000
   = 9.00×10^6

72 = 3.33
   = 3.33×10^0

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73 = 18.3
   = 1.83×10^1

74 = 2160
   = 2.16×10^3

75 = 0.322
   = 3.22×10^{-1}

76 = 34.0
   = 3.40×10^1

77 = -1.65
   = -1.65×10^0

78 = 2.75
   = 2.75×10^0

79 = 48800
   = 4.88×10^4

80 = 2.28
   = 2.28×10^0

11. $M = .05A$

$1.25 = .05A;\ so\ A = \dfrac{1.25}{.05}$

12. $\dfrac{\pi^{12}}{12^{\pi}}$

13. $24\left[1 - \dfrac{1}{3} + \dfrac{1}{15} + \dfrac{3}{8} + \dfrac{1}{12}\right]$

24.
$50 - [(37.99)(1.0875)(1.12)]$

25. $\dfrac{\left(\frac{33.8}{2}\right)\left(\frac{33.8}{2}\sqrt{3}\right)}{2}$

26. $\dfrac{1829}{31}$

35. $\dfrac{7+11}{2}$

36. Convert 13 inches to cm. The HP calculator has a conversion key. Or you can use 2.54 cm = 1 inch. 13 inches $\approx 33.02\ cm.$
$\pi r^2 h = V =$
$\pi(5)^2(33.02) = 2590\ cm^3$
So the container also holds 2590 mL of liquid.

37. $\dfrac{.00753}{.0529}$

38. Half of the base is 46.3.
height $= \sqrt{109.3^2 - 46.3^2}$
Area = 46.3h

47. The HP calculator will convert gallons to liters. Then multiply by 1000. OR
$3144\ oz\left(\dfrac{1\ g}{128\ oz}\right)\left(\dfrac{3.785L}{1\ g}\right)\left(\dfrac{1000mL}{1L}\right)$

48.
$5(6^4) + 4(6^3) + 3(6^2) + 2(6) + 1$

49. $\dfrac{\left(\sqrt{29.9^2 - 25.9^2}\right)(25.9)}{2}$

50. $asin\left(\dfrac{2977}{5210}\right)$

59. Complement of 72.69 = 90-72.69; Supplement is 180-72.69
$2(180 - 72.69) + (90 - 72.69)$

60. Slope connecting these two points is $\dfrac{8-7}{3+10} = \dfrac{1}{13}$ The perpendicular slope is -13.0 (opposite reciprocal)

61. Surface area = $2d^2$
$2(498.23)^2$

62. $V = \dfrac{1}{3}Bh$

$120 = \dfrac{1}{3}(49)h$ so height =
$\dfrac{120(3)}{49}$

71. 9 choices for first digit; 10 choices for the other 6 digits. 9×10^6

72. There are 12 face cards in a deck. 40 are not face cards. Odds of NOT getting a face card = $\dfrac{40}{12}$

73. Law of Sines:
$$\dfrac{\sin x}{8.9} = \dfrac{\sin 39}{17.8}$$
$$x = asin\left(\dfrac{8.9(\sin 39)}{17.8}\right)$$

74. diameter = $\left(\dfrac{245.9}{4}\right)\sqrt{2}$

Radius = $\dfrac{\left(\frac{245.9}{4}\right)\sqrt{2}}{2}$

Area of circle = $\pi\left(\dfrac{\left(\frac{245.9}{4}\right)\sqrt{2}}{2}\right)^2$

Area of square = $\left(\dfrac{245.9}{4}\right)^2$
Subtract the square from the circle.