8

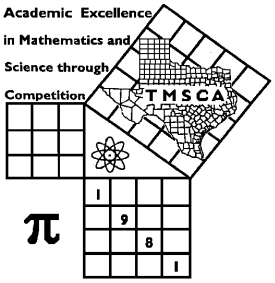
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #2 ©

OCTOBER 29, 2022

GENERAL DIRECTIONS

I. About this test:
  A. You will be given 30 minutes to take this test. There are 80 problems on this test.

II. **ALL calculators must be cleared. Calculators limited to the types specified by UIL.**

III. 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.

IV. 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).

V. 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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2022 – 2023 TMSCA Middle School Calculator Test 2

1. 835 – 1830 ---------- 1=_____

2. –55 + 45 + 27 ---------- 2=_____

3. –1580 – 1530 – 1820 ---------- 3=_____

4. 18 + 49 – 65 – 45 ---------- 4=_____

5. 93 – 38 + 35 – 59 ---------- 5=_____

6. –187 + 348 – 129 – 321 + 328 ---------- 6=_____

7. (5.71 + 2.79 – π) – (1.2 + 5.8) ---------- 7=_____

8. 0.98 + 3.24 + 1.47 + 0.455 + 0.861 ---------- 8=_____

9. 200 x 96.9 x 143 ---------- 9=_____

10. 513 x 65 x 420 x 159 ---------- 10=_____

11. Chef Ann uses 2/5 of a bag of flour to make her favorite cake. Calculate the number of bags of flour needed to make 8 cakes. - 11=_____bags

12. The distance from my house to the convenience store is 16,940 feet. Convert this distance to miles. ---------- 12=_____mi.

13. A carpenter is going to charge Freda $220.50 to install 24 feet of bookshelves. At this rate, calculate the cost to install 50 feet of bookshelves. ---------- 13=$_____

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14. $(123)[271 \times 241/51]$ ---------- 14=_____

15. $(148)[76 \times 491 \times 534]$ ---------- 15=_____

16. $\{74/209\}\left[\frac{309}{71 + 123}\right]$ ---------- 16=_____

17. $\left[\frac{86}{56}\right][(49/20) + 0.453]$ ---------- 17=_____

18. $\frac{(367/291) + (542/202)}{(178 - 182)}$ ---------- 18=_____

19. $\frac{[0.157/(0.0372)]/0.00163}{(0.00819 \times 0.00838)(21.2)}$ ---------- 19=_____

20. $\frac{(0.00265)(0.735)}{\pi}(16.5 - 18.1)$ ---------- 20=_____

21. $(2.8)[26/72 \times 112/24] - 2.47$ ---------- 21=_____

22. $\left[\frac{3950 + 2070}{2090 - 3150}\right]\left[\frac{1960}{1280}\right]$ ---------- 22=_____

23. $\frac{(1890 \times 2780)/6190}{(3490 \times 3.76) + 6280}$ ---------- 23=_____

24. Maria accepts a position at an annual starting salary of $63,000 and a $1,500 annual raise for 15 years, provided her services are satisfactory. Calculate her salary in her 15^{th} year. ---------- 24=$_____

25. Trina is making a 1:180 scale model of a sports arena. The model has a rectangular base that is 3 ft. wide and 5 ft. long. Calculate the area of the base of the actual arena. ---------- 25=_____$ft.^2$

26. Morgan is thinking of two integers. One number is three less than twice the other number. Their sum is 51. Calculate the value of the larger number. ---------- 26= _____INT.

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27. $(0.0149)\left[(0.0322/0.0315)(1.48/4.22)\right]$ ---------- 27=_____

28. $\left[4650 - (6400 + 8520)\right] + \left[(-1.29)(7270 - 1680)\right]$ ------ 28=_____

29. $\dfrac{(0.368 + 0.18)(0.941 + 1.5)}{(6.06\text{x}10^{10})}$ ---------- 29=_____

30. $[106]\left[\dfrac{1/0.0169}{1/0.019}\right]$ ---------- 30=_____

31. $(0.181)\left[\dfrac{8.09\text{x}10^{-4}}{(1.44\text{x}10^{10})}\right]$ ---------- 31=_____

32. $\dfrac{1}{134} + \dfrac{1}{(110 - 45.7)}$ ---------- 32=_____

33. $\left[\dfrac{1/138}{1/55.6}\right][2.64\text{x}10^{6}]$ ---------- 33=_____

34. $\dfrac{1}{340} - \dfrac{1}{(169 + 139)}$ ---------- 34=_____

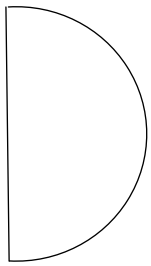
35. If x is directly proportional to y^3 and x=6 when y = 2, calculate the Value of x when y = 6. ---------- 35=_____INT.

36. Zach is four years older than Adam. Twenty years ago, Zach was twice as old as Adam. Calculate Zachs' age at the present time. 36=_____INT.

37.

SEMICIRCLE

Radius = 17.21

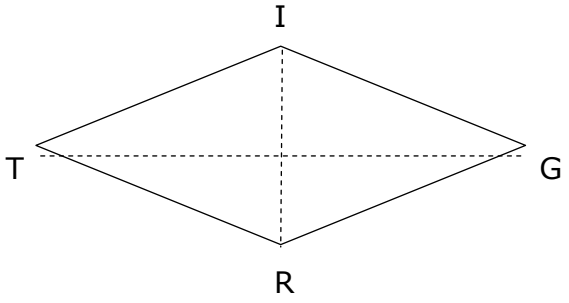


Perimeter = ?

37= _____

38.

RHOMBUS



TG = 17.25
IG = 7.81

Area = ?

38= _____

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39. $\left[\frac{14.6}{6.38}\right](8.06 + 2.56)^3$ ---------- 39=_____

40. $\left[\frac{882 + (1/(8.22\text{x}10^{-4}))}{(1620/1240) - 1.03}\right]^2$ ---------- 40=_____

41. $\frac{(68200 + 58700)^2}{(0.00522 - 0.00422)^3}$ ---------- 41=_____

42. $\sqrt{208 - 199 + 740} - \sqrt{798}$ ---------- 42=_____

43. $\sqrt{(360/1120) + 0.31 - 0.045}$ ---------- 43=_____

44. $(1/(0.00551))(11800 - 7030)^2$ ---------- 44=_____

45. $\frac{1}{\sqrt{106 + 97.1 + 138}} + \left(\frac{1}{\sqrt{2.8}}\right)^3$ ---------- 45=_____

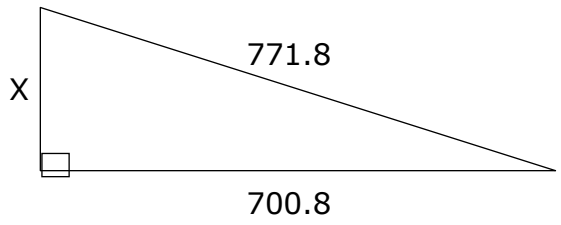
46. $\sqrt{1.53 - 67.8/55.9} + 1/\sqrt{6.54 + 5.9}$ ---------- 46=_____

47. Lindsay drove to her parents, 152 miles in 2 ½ hours. She drove home, same route, in 1 ¾ hours. Calculate her average speed for the round trip. ---------- 47=_____mph

48. Calculate 725^{527}. ---------- 48=_____

49.

RIGHT TRIANGLE

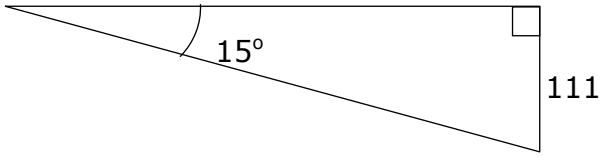


X = ?

49= _____

50.

RIGHT TRIANGLE



X = ?

50= _____

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51. $\dfrac{(129 + 100 - 123)^4}{\sqrt{1.49 + 1.17 + 1.44}}$ ---------- 51=_____

52. $\left[\dfrac{\sqrt{\sqrt{0.0154 - 0.0128}}}{-(0.262 - 0.182)}\right]^2 [1.49 + 2.52]$ ---------- 52=_____

53. $\sqrt{\dfrac{259}{(25300)(0.0645)}} + \dfrac{(0.349 - 0.397)}{(0.0914 + 0.0184)}$ ---------- 53=_____

54. $(408)^2 \sqrt{(14.4)/(40.5)} - (65800 + 80100)$ ---------- 54=_____

55. $0.849 + \sqrt{(4260)/(682)} - (0.607 + 0.269)^2$ ---------- 55=_____

56. $(21.7)(3.09 \times 10^7)^{1/2} - [(4.54 \times 10^9)(3.78 \times 10^{10})]^{1/4}$ ----- 56=_____

57. (deg) $\cos(825^\circ) + (0.945/0.835)$ ---------- 57=_____

58. $\sqrt{\dfrac{(583)(3880)}{(45.1) + (15.3)}} + 1/(0.00517)^1$ ---------- 58=_____

59. A spherical water balloon is filled with water so that it has a diameter of 6 in. If Eleanor filled it some more so that the diameter is 10 in. Calculate how much water she added in cubic inches. -- 59=_____$in.^3$

60. Stan has a bag of equally sized cubes. Twelve cubes are red, nine are blue, five are white and two are green. Two cubes are drawn without replacement. Calculate the probability that both are blue. ---------- 60=_____

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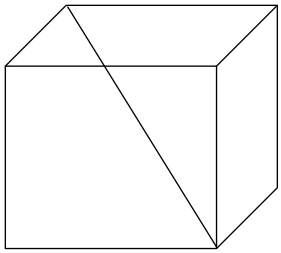
61.

CUBE



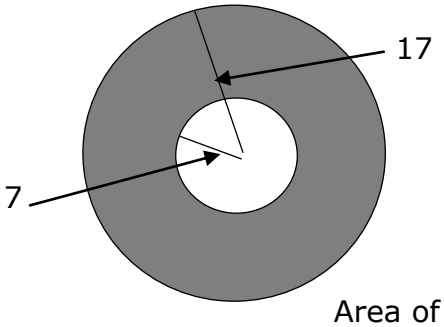
Inner Diagonal = 7.77

Surface Area = ?

61= _____

62.

COCENTRIC CIRCLES



Area of Annulus = ?

62= _____

63. $\frac{18! - 13!}{26!}$ ---------- 63=_____

64. $(2.07\text{x}10^{6} - 3.48\text{x}10^{6})^{-5}(74700)$ ---------- 64=_____

65. (deg) $(40 - 22)\tan(204°)$ ---------- 65=_____

66. (rad) $\tan\left[\frac{(149)(\pi)}{(6.62)(198)}\right]$ ---------- 66=_____

67. (deg) $\tan(0.881° - 0.658°) + 4.83\text{x}10^{-4}$ ---------- 67=_____

68. (deg) $\frac{\sin(1.69°) - \tan(1.69°)}{\sin(1.69°)}$ ---------- 68=_____

69. (deg) $\frac{\sin(13.8°)}{1.97 + 0.673}$ ---------- 69=_____

70. $\left[(297)\left(\frac{55.9}{(354)(\pi)}\right)\right]^{7/2}$ ---------- 70=_____

71. Two pipes are filling a water tank. One can fill the tank in twelve hours and the other in sixteen hours. Calculate the time in hours it will take to fill the tank if both are filling the tank at the same time. ---------- 71=_____hrs.

72. Jamie worked 22 hours babysitting. She makes $5 per hour from The Smiths and $6 per hour from the Jones. If she earned $119, Calculate the number of hours she babysat for the Jones'. ------ 72=_____INT.

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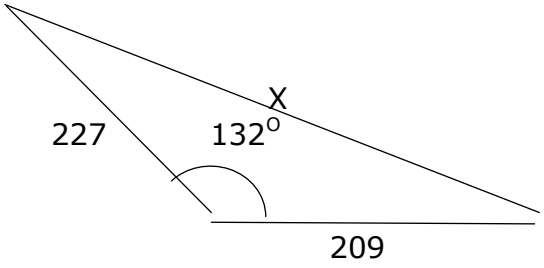
73.

SCALENE TRIANGLE

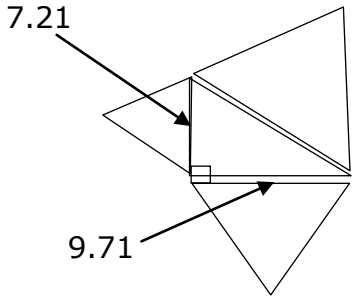


X = ?

73= _____

74.

RIGHT TRIANGLE AND EQUILATERAL TRIANGLES



Total Area of all triangles = ?

74= _____

75. $\dfrac{\text{Log}(1.80\text{x}10^{9} + 2.04\text{x}10^{9})}{16.7}$ ---------- 75=_____

76. $\dfrac{1.15 + \sqrt{(1.6)(3.72)} + (0.437)(5.75)}{\sqrt{\sqrt{0.335 + 3.11}}}$ ---------- 76=_____

77. $(19800)10^{(0.84)(6.38)}$ ---------- 77=_____

78. $\text{Ln}\left[\dfrac{78.5 + 160 + 119}{466 - 24.1 - 33.8}\right]$ ---------- 78=_____

79. $1 + 2 + 3 + \ldots + 993$ ---------- 79=_____

80. $\dfrac{1}{(0.5)} + \dfrac{1}{3(0.5)^3} + \dfrac{1}{5(0.5)^5} + \dfrac{1}{7(0.5)^7}$ ---------- 80=_____

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2022 – 2023 TMSCA Middle School Calculator Test 2 Answer Key

Page 1

1 = -995
= -9.95×10^{2}

2 = 17.0
= 1.70×10^{1}

3 = -4930
= -4.93×10^{3}

4 = -43.0
= -4.30×10^{1}

5 = 31.0
= 3.10×10^{1}

6 = 39.0
= 3.90×10^{1}

7 = -1.64
= -1.64×10^{0}

8 = 7.01
= 7.01×10^{0}

9 = 2.77×10^{6}

10 = 2.23×10^{9}

11 = 3.20
= 3.20×10^{0}

12 = 3.21
= 3.21×10^{0}

13 = $459.38

Page 2

14 = 158000
= 1.58×10^{5}

15 = 2.95×10^{9}

16 = 0.564
= 5.64×10^{-1}

17 = 4.46
= 4.46×10^{0}

18 = -0.986
= -9.86×10^{-1}

19 = 1.78×10^{6}

20 = -0.000992
= -9.92×10^{-4}

21 = 2.25
= 2.25×10^{0}

22 = -8.70
= -8.70×10^{0}

23 = 0.0437
= 4.37×10^{-2}

24 = $84,000

25 = 486000
4.86×10^{5}

26 = 33 INT.

Page 3

27 = 0.00534
= 5.34×10^{-3}

28 = -17500
= -1.75×10^{4}

29 = 2.21×10^{-11}

30 = 119
= 1.19×10^{2}

31 = 1.02×10^{-14}

32 = 0.0230
= 2.30×10^{-2}

33 = 1.06×10^{6}

34 = -0.000306
= -3.06×10^{-4}

35 = 162 INT.

36 = 28 INT.

37 = 88.5
= 8.85×10^{1}

38 = 67.4
= 6.74×10^{1}

Page 4

39 = 2740
= 2.74x103

40 = 5.76x107

41 = 1.61x1019

42 = -0.881
= -8.81x10-1

43 = 0.766
= 7.66x10-1

44 = 4.13x109

45 = 0.268
= 2.68x10-1

46 = 0.847
= 8.47x10-1

47 = 71.5
= 7.15×10^{1}

48 = 2.50×10^{1507}

49 = 323
= 3.23×10^{2}

50 = 414
= 4.14×10^{2}

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Page 5

51 = 6.23×10^{7}

52 = 31.9
= 3.19×10^{1}

53 = -0.0388
= -3.88×10^{-2}

54 = -46600
= -4.66×10^{4}

55 = 2.58
= 2.58×10^{0}

56 = 6170
= 6.17×10^{3}

57 = 0.873
= 8.73×10^{-1}

58 = 387
= 3.87×10^{2}

59 = 411
= 4.11×10^{2}

60 = 0.0952
= 9.52×10^{-2}

Page 6

61 = 121
= 1.21×10^{2}

62 = 754
= 7.54×10^{2}

63 = 1.59×10^{-11}

64 = -1.34×10^{-26}

65 = 8.01
= 8.01×10^{0}

66 = 0.373
= 3.73×10^{-1}

67 = 0.00438
= 4.38×10^{-3}

68 = -0.000435
= -4.35×10^{-4}

69 = 0.0903
= 9.03×10^{-2}

70 = 12900
= 1.29×10^{4}

71 = 6.86
= 6.86×10^{0}

72 = 9 INT.

Page 7

73 = 398
= 3.98×10^{2}

74 = 162
= 1.62×10^{2}

75 = 0.574
= 5.74×10^{-1}

76 = 4.48
= 4.48×10^{0}

77 = 4.53×10^{9}

78 = -0.132
= -1.32×10^{-1}

79 = 494000
= 4.94×10^{5}

80 = 29.4
= 2.94×10^{1}

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TMSCA 2022-2023 MS CA Test 2 Solutions to Word and Geometry Problems

11. $\frac{2}{5}(8)$

12. $\frac{16940}{5280}$

13. $\frac{220.50}{24} = \frac{x}{50}$

$$x = \frac{50(220.50)}{24}$$

24. $a_n = a_1 + (n-1)d$

$a_{15} = 63000 + (15-1)(1500)$

$a_{15} = 63000 + (14)(1500)$

25. $\frac{1}{180} = \frac{3}{x}$; $x = 3(180)$

$\frac{1}{180} = \frac{5}{y}$; $y = 5(180)$

$A = 3(180)(5)(180)$

26. $n =$ one number

$2n - 3 =$ other number

$n + 2n - 3 = 51$

Solve: $n = 18; 2n - 3 = 33$

35. $\frac{6}{2^3} = \frac{x}{6^3}; x = \frac{216(6)}{8}$

36.

	20 years ago	Now
Zach	$x - 20$	x
Adam	$x - 4 - 20$	$x - 4$

$$x - 20 = 2(x - 24)$$
$$x - 20 = 2x - 48$$
$$x = 28$$

37.

$$P = \pi r + 2r = r(\pi + 2)$$
$$17.21(\pi + 2)$$

38. $\frac{d_1 d_2}{2} = \frac{17.25(7.81)}{2}$

47. $\frac{total\ distance}{total\ time} = \frac{152+152}{2.5+1.75}$

48. 527 [ENTER] 725 [log] [x] [SHOW] *(Look at the digits to the left of the decimal. This gives 1507 for the exponent. Write down 10^{1507}.) Then punch*

1507 [−] [10^x]

(This gives 2.50 E0 which is the first part of your answer.

The answer is **2.50×10^{1507}**). *This is done on the HP RPN calculator.*

49. $\sqrt{771.8^2 - 700.8^2}$

50. $\frac{\tan 15}{1} = \frac{111}{x}$

$$x = \frac{111}{\tan 15}$$

59. The two radii are 5 in. and 3 in. Using $V = \frac{4}{3}\pi r^3$ the change in volume is

$$\frac{4}{3}\pi(5^3 - 3^3)$$

60. $\frac{9}{12+9+5+2} \cdot \frac{8}{12+9+5+1}$

$$\frac{9}{28} \cdot \frac{8}{27}$$

61. $SA = 2d^2 = 2(7.77)^2$

62. $\pi R^2 - \pi r^2 =$

$$\pi(R^2 - r^2)$$
$$\pi(17^2 - 7^2)$$

71. $\frac{12(16)}{12+16}$

72. S = Smiths; J = Jones

$$\begin{Bmatrix} S + J = 22 \\ 5S + 6J = 119 \end{Bmatrix}$$

Multiply first equation by -5

$$\begin{Bmatrix} -5S - 5J = -110 \\ 5S + 6J = 119 \end{Bmatrix}$$

Add the two equations

$$J = 9$$

73. Law of cosines:

$$x = \sqrt{a^2 + b^2 - 2abCosC}$$

$$\sqrt{209^2 + 227^2 - 2(209)(227)Cos132}$$

74. right triangle: $\frac{(7.21)(9.71)}{2}$

Large Eq. triangle has side

$$\sqrt{7.21^2 + 9.71^2}$$

Large Eq. triangle has Area

$$\frac{\left(\sqrt{7.21^2 + 9.71^2}\right)^2\sqrt{3}}{4}$$

Medium Eq. triangle has Area

$$\frac{9.71^2\sqrt{3}}{4}$$

Small Eq. triangle has Area

$$\frac{7.21^2\sqrt{3}}{4}$$

Find the sum of all 4 areas.

79. $\frac{993(994)}{2}$