

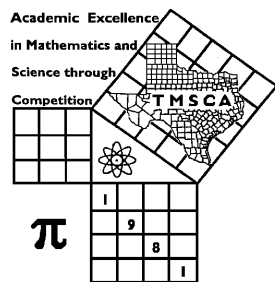
8 1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ Final Score
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

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 # 5 ©

DECEMBER 3, 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*}, 1.23x10¹, 1.23x10⁰¹, .0190, 1.90x10⁻²
 Incorrect: 12.30, 123.0, 1.23(10)², 1.23·10², 1.230x10², 1.23*10², 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.

2022 – 2023 TMSCA Middle School Calculator Test 5

1. $3650 - 1760$ ----- 1= _____

2. $27 + 30 - 24$ ----- 2= _____

3. $512 + 1210 - 770$ ----- 3= _____

4. $12 - 10 - 10 + \pi$ ----- 4= _____

5. $66 + 74 - 209 - 124$ ----- 5= _____

6. $229 + 270 - 154 - 315 - 339$ ----- 6= _____

7. $-1.32 + 1.44 - \pi + 1.56 + 1.15$ ----- 7= _____

8. $(-3.63 + 3.64 - 1.76) - (2.42 + 3.94)$ ----- 8= _____

9. $89.5 \times 50.9 \times 178$ ----- 9= _____

10. $1100 \times 176 \times 199 \times 1390$ ----- 10= _____

11. Wynonna had 5 lots of pigs to sell at market. The weights of the lots were 5,670 lbs., 7,152 lbs., 2,230 lbs., 6,251 lbs., and 5,521 lbs. Calculate the range of this group of weights. ----- 11= _____

12. The GVW, gross vehicle weight, of a certain SUV is 7,100 lbs. Calculate the number of kilograms the vehicle weighs. ----- 12= _____ kg

13. The area of a circle is 2121 cm^2 . Calculate the circumference of the circle. ----- 13= _____ cm

14. $(429)[207 \times 525/512]$ ----- 14= _____

15. $-120/[92 \times 27 \times 27]$ ----- 15= _____

16. $\{(80)(26 - 111)(119)\} - 7.27 \times 10^5$ ----- 16= _____

17. $\left[\frac{234}{131}\right] [(101/94) + 0.208]$ ----- 17= _____

18. $\left[\frac{(1490/656) - (2290/2700)}{0.36/0.735}\right]$ ----- 18= _____

19. $\left[\frac{426/318}{463/341}\right] \{13.8 + 18.4 - 17.4\}$ ----- 19= _____

20. $\frac{175}{(285 - 56)} - \frac{(82 - 228)}{87}$ ----- 20= _____

21. $\frac{(\pi)(7/14)(26/9)}{213}$ ----- 21= _____

22. $\frac{(\pi)(84/146)(64/88)}{(98/36)}$ ----- 22= _____

23. $\left[\frac{2360 + 5240}{5600 - 5210}\right] \left[\frac{5980}{3280}\right]$ ----- 23= _____

24. Tammy has a 22 in. by 17 in. plaque made in memory of her father. the engraving for it costs \$0.22 per letter. If she has 42 words in 205 letters engraved on the plaque, calculate how much the engraving will cost. ----- 24=\$ _____

25. The perimeter of an equilateral triangle is 723 cm. Calculate the height of the triangle in cm. ----- 25= _____ cm

26. The ratio of snakes to frogs to lizards in the zoo was 9:4:7. If there were a total of 1,000 of these reptiles in the zoo, calculate how many are snakes. ----- 26= _____ INT.

27. $(6.55)[(19.9/14.9)(55.4 + 37.2)]$ ----- 27= _____

28. $\frac{(30.7 - 56.8)(13.8 + 13.4)}{(1.63 \times 10^{11})}$ ----- 28= _____

29. $[3930 - (2280 + 6190)] + [(\pi)(2670 - 5210)]$ ----- 29= _____

30. $[139] \left[\frac{1/0.0327}{1/0.034} \right]$ ----- 30= _____

31. $\frac{1}{-0.0952} + \frac{1}{(\pi)(0.0116 - 0.0611)}$ ----- 31= _____

32. $\frac{(0.0177 + 0.0124)}{(1.66 \times 10^{11})}$ ----- 32= _____

33. $\left[\frac{1/63.4}{1/161} \right] + [0.31]$ ----- 33= _____

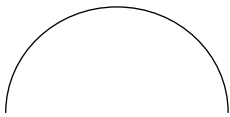
34. $1/(0.00253 - 0.00135) - 1/(0.00106)$ ----- 34= _____

35. Scott and Kirk go to the movies. They have a buy one get one free coupon for the tickets. They see a movie that costs \$12 and they both get a movie snack pack that costs \$10.95. Calculate the total they spent at the movies. ----- 35=\$ _____

36. Calculate 2534 Base 7 in Base 10. ----- 36= _____ INT.

37. SEMICIRCLE

Perimeter = 11515

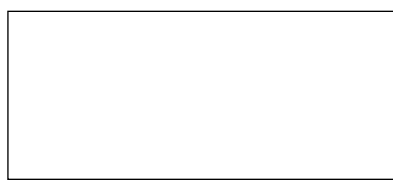


Radius = ?

37= _____

38. RECTANGLE

Area = 143,736



212

Length = ?

38= _____

39. $\sqrt[4]{\frac{31.8 + 8.04}{31.2 - 28.3}}$ ----- 39= _____

40. $\frac{(18800 + 43300)^3}{(0.228 - 0.242)^2}$ ----- 40= _____

41. $\left[\frac{4.57}{84.7}\right](40 + 23.2)^4$ ----- 41= _____

42. $(1/(0.00246))(3050 - 2950)^3$ ----- 42= _____

43. $\sqrt{2580} + \sqrt{1330 + 1540} - (\pi)\sqrt{2360}$ ----- 43= _____

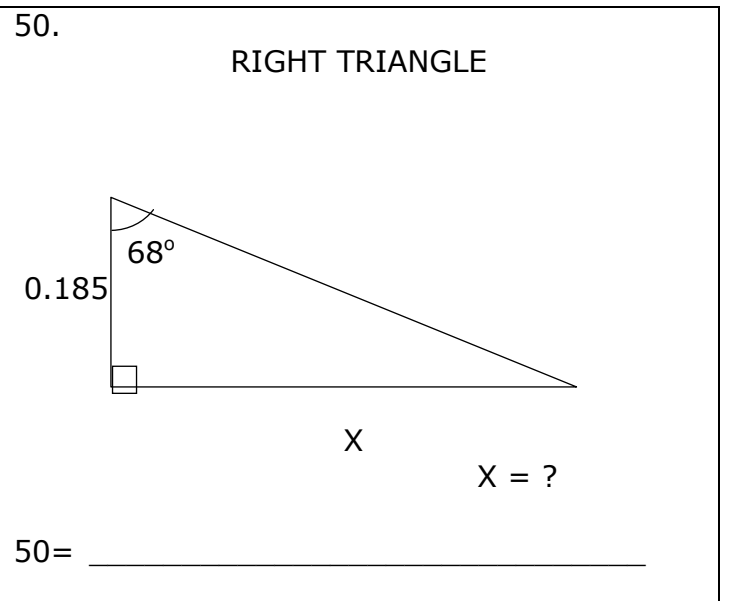
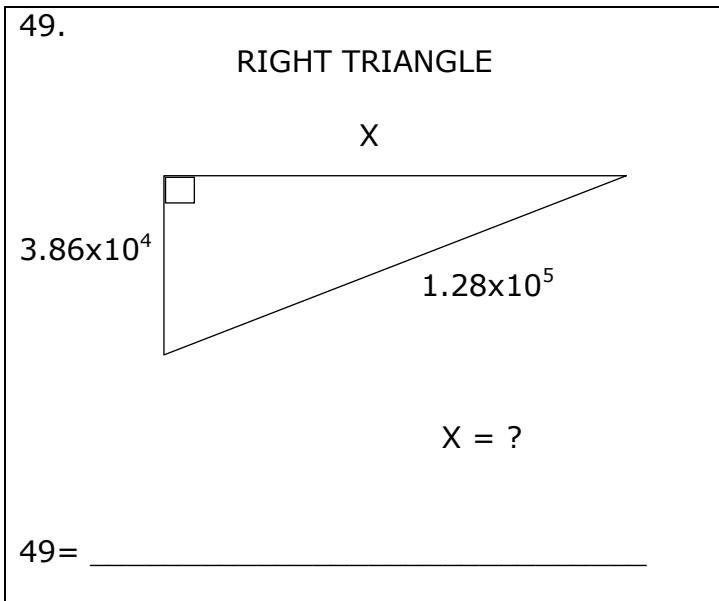
44. $(1/\pi)\sqrt{\frac{3.61 + 1.27}{0.0343 - 0.00958}}$ ----- 44= _____

45. $\sqrt[3]{10.2 - 923/492} + 1/\sqrt{0.00153 + 1.80 \times 10^{-4}}$ ----- 45= _____

46. $\frac{(1330 + 3260)^{1/3}}{(43300 - 6630)^{1/3}}$ ----- 46= _____

47. Each side of a 5x7 photo is enlarged by 50%. Calculate the percent increase in area of the photo. ----- 47= _____%

48. In old times an "atom" was the smallest measurable quantity of time. There was thought to be 376 atoms in a minute making an atom equal to .15957 seconds. Calculate the number of atoms in a day. 48= _____atoms



51. $\frac{(0.0123 + 0.00858 - 0.0111)^3}{\sqrt{160 + 28.4 + 233}}$ ----- 51= _____

52. $\left[\frac{\sqrt{\sqrt{191 - 185}}}{-(479 - 922)} \right]^2 [203 + 159]$ ----- 52= _____

53. $\frac{\sqrt{4.45 + \pi + 1.39}}{(77.2 - 118 + 118)^2}$ ----- 53= _____

54. $4.75 + \sqrt{(1920)/(48.6)} - (0.773 + 1.99)^2$ ----- 54= _____

55. $(182)^2 \sqrt{(0.339)/(48.4)} - (1440 + 2260)$ ----- 55= _____

56. $(9.19)(2.67 \times 10^{10})^{1/2} - [(3.14 \times 10^8)(8.52 \times 10^9)]^{1/3}$ ----- 56= _____

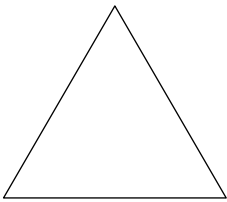
57. $\sqrt{\frac{(11.7)(3.17)}{(422) + (882)}} + 1/(0.552)^{-3}$ ----- 57= _____

58. (rad) $\tan(46.4) + (34.8/36.3)$ ----- 58= _____

59. Calculate the length of the longest diagonal in a regular polygon with 22 sides that are 5.23 cm in length. ----- 59= _____ cm

60. An urn contains 31 marbles. Twelve are blue, seven are white, eleven are red and one is yellow. Calculate the probability of drawing out one marble and it being red or yellow. ----- 60= _____

61. EQUILATERAL TRIANGLE

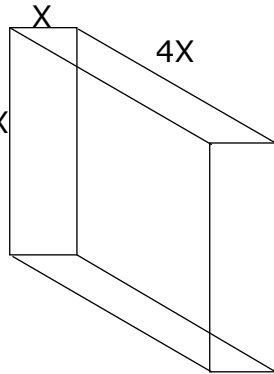


Height = 72900

Area = ?

61= _____

62. RECTANGULAR PRISM



Volume 14750

X = ?

62= _____

63. $\frac{9! - 32!}{17!}$ ----- 63= _____

64. (deg) $\frac{\sin(17.1^\circ)}{65.7}$ ----- 64= _____

65. $(1.61 \times 10^6 - 1.11 \times 10^7)^4 (88900)$ ----- 65= _____

66. (rad) $\sin\left[\frac{(1.32)(\pi)}{(10.1)(1.96)}\right]$ ----- 66= _____

67. (rad) $\frac{\tan(4.17)}{91.1/48.2}$ ----- 67= _____

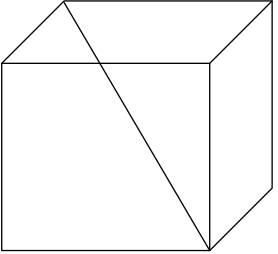
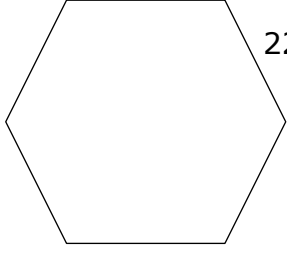
68. (rad) $(1250)\sin(692)$ ----- 68= _____

69. (deg) $\frac{\sin(110^\circ)}{\tan(110^\circ)} [38.7]$ ----- 69= _____

70. $\left[(159) \left(\frac{1000}{(61.9)(\pi)} \right) \right]^{3/2}$ ----- 70= _____

71. Calculate the geometric mean of 7,250 and 10,711. ----- 71= _____

72. A briefcase has a combination lock made of four tumblers with the digits 0 - 9 on them. Calculate the number of different combinations the lock has. Repetition is not allowed. ----- 72= _____ INT.

<p>73. CUBE</p> <p>Inner Diagonal = 12.57</p>  <p>Volume = ?</p> <p>73= _____</p>	<p>74. REGULAR HEXAGON</p>  <p>222</p> <p>Area = ?</p> <p>74= _____</p>
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75. $\frac{\text{Log}(3.97 \times 10^5 + 5.58 \times 10^5)}{33.4}$ ----- 75= _____

76. $\frac{0.569 + \sqrt{(0.505)(0.428) + (0.108)(0.767)}}{\sqrt{\sqrt{0.0401 + 0.0211}}}$ ----- 76= _____

77. $\text{Log}(23900 + 28500 + 6840)$ ----- 77= _____

78. $(376)^\pi (0.121)^4 (23 - 11.5)^2$ ----- 78= _____

79. $1 + 2 + 3 + \dots + 450$ ----- 79= _____

80. $1 + \frac{(0.829)^4}{2} - \frac{(0.829)^6}{6} + \frac{(0.829)^8}{24} - \frac{(0.829)^{10}}{120}$ ----- 80= _____

2022 – 2023 TMSCA Middle School Calculator Test 5 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = 1890 = 1.89×10^3	14 = 91100 = 9.11×10^4	27 = 810 = 8.10×10^2	39 = 1.93 = 1.93×10^0
2 = 33.0 = 3.30×10^1	15 = -0.00179 = -1.79×10^{-3}	28 = -4.36×10^{-9}	40 = 1.22×10^{18}
3 = 952 = 9.52×10^2	16 = -1.54×10^6	29 = -12500 = -1.25×10^4	41 = 861000 = 8.61×10^5
4 = -4.86 = -4.86×10^0	17 = 2.29 = 2.29×10^0	30 = 145 = 1.45×10^2	42 = 4.07×10^8
5 = -193 = -1.93×10^2	18 = 2.91 = 2.91×10^0	31 = -16.9 = -1.69×10^1	43 = -48.3 = -4.83×10^1
6 = -309 = -3.09×10^2	19 = 14.6 = 1.46×10^1	32 = 1.81×10^{-13}	44 = 4.47 = 4.47×10^0
7 = -0.312 = -3.12×10^{-1}	20 = 2.44 = 2.44×10^0	33 = 2.85 = 2.85×10^0	45 = 26.2 = 2.62×10^1
8 = -8.11 = -8.11×10^0	21 = 0.0213 = 2.13×10^{-2}	34 = -95.9 = -9.59×10^1	46 = 0.500 = 5.00×10^{-1}
9 = 811000 = 8.11×10^5	22 = 0.483 = 4.83×10^{-1}		
10 = 5.36×10^{10}	23 = 35.5 = 3.55×10^1	35 = \$33.90	47 = 125 = 1.25×10^2
		36 = 956 INT.	48 = 541000 = 5.41×10^5
11 = 4920 = 4.92×10^3	24 = \$45.10	37 = 2240 = 2.24×10^3	49 = 122000 = 1.22×10^5
12 = 3220 = 3.22×10^3	25 = 209 = 2.09×10^2	38 = 678 = 6.78×10^2	50 = 0.458 = 4.58×10^{-1}
13 = 163 = 1.63×10^2	26 = 450 INT.		

2022 – 2023 TMSCA Middle School Calculator Test 5 Answer Key

Page 5

$$51 = 4.56 \times 10^{-8}$$

$$52 = 0.00452 \\ = 4.52 \times 10^{-3}$$

$$53 = 0.000503 \\ = 5.03 \times 10^{-4}$$

$$54 = 3.40 \\ = 3.40 \times 10^0$$

$$55 = -928 \\ = -9.28 \times 10^2$$

$$56 = 113000 \\ = 1.13 \times 10^5$$

$$57 = 0.337 \\ = 3.37 \times 10^{-1}$$

$$58 = 0.0747 \\ = 7.47 \times 10^{-2}$$

$$59 = 36.7 \\ = 3.67 \times 10^1$$

$$60 = 0.387 \\ = 3.87 \times 10^{-1}$$

Page 6

$$61 = 3.07 \times 10^9$$

$$62 = 10.7 \\ = 1.07 \times 10^1$$

$$63 = -7.40 \times 10^{20}$$

$$64 = 0.00448 \\ = 4.48 \times 10^{-3}$$

$$65 = 7.21 \times 10^{32}$$

$$66 = 0.208 \\ = 2.08 \times 10^{-1}$$

$$67 = 0.878 \\ = 8.78 \times 10^{-1}$$

$$68 = 939 \\ = 9.39 \times 10^2$$

$$69 = -13.2 \\ = -1.32 \times 10^1$$

$$70 = 23400 \\ = 2.34 \times 10^4$$

$$71 = 8810 \\ = 8.81 \times 10^3$$

$$72 = 5040 \text{ INT.}$$

Page 7

$$73 = 382 \\ = 3.82 \times 10^2$$

$$74 = 128000 \\ = 1.28 \times 10^5$$

$$75 = 0.179 \\ = 1.79 \times 10^{-1}$$

$$76 = 2.25 \\ = 2.25 \times 10^0$$

$$77 = 4.77 \\ = 4.77 \times 10^0$$

$$78 = 3.49 \times 10^6$$

$$79 = 101000 \\ = 1.01 \times 10^5$$

$$80 = 1.19 \\ = 1.19 \times 10^0$$

TMSCA 2022-2023 MS CA Test 5 Solutions to Word and Geometry Problems

11. $7152 - 2230$

12. Many calculators have a conversion key. If not,

$$\frac{7100}{2.2}$$

13. $\pi r^2 = 2121$

$$r = \sqrt{\frac{2121}{\pi}}$$

$$C = 2\pi r = 2\pi \left(\sqrt{\frac{2121}{\pi}} \right)$$

24. $205(.22)$

25. Height = $\frac{\text{side}}{2} \sqrt{3}$

$$\frac{723 \div 3}{2} \sqrt{3}$$

26. $9x + 4x + 7x = 1000$

$$20x = 1000; x = 50$$

Snakes = $9x = 9(50)$

35. $12 + 10.95(2)$

36.

$$2(7^3) + 5(7^2) + 3(7) + 4$$

37. $2r + \pi r =$

$$r(2 + \pi) = 11515$$

$$r = \frac{11515}{2 + \pi}$$

38. Length = $\frac{143736}{212}$

47. $5 \times 7 = 35$

Increases to $5(1.5)$ by $7(1.5) =$

$$7.5 \times 10.5 = 78.75$$

On HP calculator from 35 to

78.75,

Enter 35, then punch 78.75, then punch % CHG key.

Otherwise, $\frac{78.75-35}{35}(100)$

48.

$$\frac{1 \text{ atom}}{.15957} \cdot \frac{60 \text{ s}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{24 \text{ hr}}{1 \text{ day}}$$

49.

$$\sqrt{(1.28 \times 10^5)^2 - (3.86 \times 10^4)^2}$$

50. $\frac{\tan 68}{1} = \frac{x}{.185}$

$$x = .185(\tan 68)$$

59. Longest diagonal with even number of sides:

$$\frac{\text{side}}{\sin \frac{180}{n}} = \frac{5.23}{\sin \frac{180}{22}}$$

60. $\frac{11+1}{12+7+11+1} = \frac{12}{31}$

61. $A = \frac{h^2 \sqrt{3}}{3} = \frac{72900^2 \sqrt{3}}{3}$

62. $3x(x)(4x) = 14750$

$$12x^3 = 14750$$

$$x = \sqrt[3]{\frac{14750}{12}}$$

71. $\sqrt{(7250)(10711)}$

72. $10(9)(8)(7)$

73. edge: $\frac{12.57}{\sqrt{3}}$

Volume: $e^3 = \left(\frac{12.57}{\sqrt{3}} \right)^3$

74. 6 equilateral triangles

$$6 \left\{ \frac{222^2 \sqrt{3}}{4} \right\}$$

79. $\frac{450(451)}{2}$