

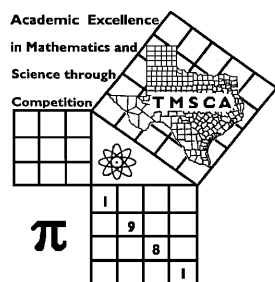
8 1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ Final Score
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

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 # 6 ©

DECEMBER 10, 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 6

1. $2610 - 548$ ----- 1= _____

2. $0.9 + 0.4 + 0.9$ ----- 2= _____

3. $-228 - 490 + 933$ ----- 3= _____

4. $15 - \pi - 5 + 17$ ----- 4= _____

5. $-2160 + 1760 + 826 + 739$ ----- 5= _____

6. $119 + 119 - 162 - 312 + 218$ ----- 6= _____

7. $-1.76 - 1.32 + 4.75 - 2.37 - 2.92$ ----- 7= _____

8. $1.17 + 0.217 + 1.18 + 1.15 + 0.734$ ----- 8= _____

9. $209 \times 54.6 \times 89.7$ ----- 9= _____

10. $3930 \times 3990 \times 47.7 \times 49.3$ ----- 10= _____

11. Adrian has made test scores of 89, 95, 92, 88, and 85. On the last two tests, he averages 98. Calculate his overall test average. 11= _____

12. The perimeter of an equilateral triangle is 795 in. Calculate the area of the triangle in square inches. ----- 12= _____ in.²

13. Gina worked all of the problems on her TMSCA calculator test. She found out that she missed 3 on every page. Calculate her score. 13= _____ INT.

14. $(131)[27 \times 50/78]$ ----- 14= _____

15. $(63/96)[51 - 45]$ ----- 15= _____

16. $\{-123/370\} \left[\frac{514}{746 + 731} \right]$ ----- 16= _____

17. $\left[\frac{131}{139} \right] [(370/302) + 0.455]$ ----- 17= _____

18. $\left[\frac{71/33}{33/45} \right] \{0.0112 + 0.00785 - 0.00516\}$ ----- 18= _____

19. $\frac{(608/303) + (373/131)}{(8.49 \times 10^{-4} - 0.00243)}$ ----- 19= _____

20. $\frac{2.31 \times 10^{-4} + 1.48 \times 10^{-4} + 1.14 \times 10^{-4}}{(1800)(0.025)(1.05 \times 10^{-4})}$ ----- 20= _____

21. $\frac{139}{(89 - 32)} - \frac{(32 - 103)}{34}$ ----- 21= _____

22. $\left[\frac{1370 + 1360}{651 - 694} \right] \left[\frac{308}{988} \right]$ ----- 22= _____

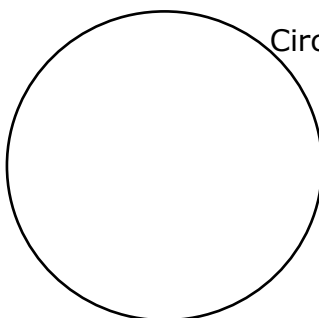
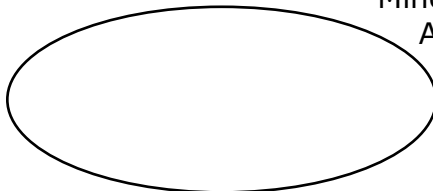
23. $\frac{(6.9 + 13.8 - 11)}{\{(1600 - 187)/(11.3)\}}$ ----- 23= _____

24. Calculate the harmonic mean of all the two-digit positive integers ending in five. ----- 24= _____

25. Abby is three times as old as Jane. In eight years, the sum of their ages will be 28. Calculate Janes' present age. ----- 25= _____ INT.

26. I have a sixteen-foot tape measure. Calculate how long the tape measure is in centimeters. ----- 26= _____ cm

27. $[4760 - (4270 + 5590)] + [(2.69)(3580 - 5100)]$ ----- 27= _____
28. $\frac{(5.62 \times 10^9) + (1.97 \times 10^9)}{(-5.42)(19.5) - 12.5}$ ----- 28= _____
29. $\frac{(23.5 - 21.2)(195 + 232)}{(9.71 \times 10^{10})}$ ----- 29= _____
30. $(10.9)[(3.44 \times 10^8) - (1.39 \times 10^8)]$ ----- 30= _____
31. $(0.562) \left[\frac{0.163}{(1.96 \times 10^9)} \right]$ ----- 31= _____
32. $[0.0774] \left[\frac{1/0.0275}{1/0.0208} \right]$ ----- 32= _____
33. $\left[\frac{1/2060}{1/2630} \right] [5.57 \times 10^6]$ ----- 33= _____
34. $1/(0.0358 - 0.0292) - 1/(0.00609)$ ----- 34= _____
35. The volume of a sphere is 1.38×10^8 . If the radius of the sphere is cut in half, recalculate the volume of the sphere. ----- 35= _____
36. Calculate the distance between the two points (6,-7) and (-8,4) on the coordinate plane. ----- 36= _____

<p>37. CIRCLE</p> <div style="text-align: center;">  <p style="margin-left: 100px;">Circumference = 112233</p> <p style="margin-left: 100px;">Area = ?</p> </div> <p>37= _____</p>	<p>38. ELLIPSE</p> <div style="text-align: center;">  <p style="margin-left: 100px;">Minor Axis = 73.8 Area = 9796</p> <p style="margin-left: 100px;">Major Axis = ?</p> </div> <p>38= _____</p>
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39. $\left[\frac{46100 + (1/(2.41 \times 10^{-5}))}{(54200/45400) - 0.733} \right]^2$ ----- 39= _____

40. $(3560 + 1250 + 682)^2(15.2 + 8.58)^2$ ----- 40= _____

41. $\frac{(4020 + 29400)^3}{(0.0895 - 0.0787)^2}$ ----- 41= _____

42. $(1/\pi) \sqrt[3]{\frac{0.00309 + 0.00796}{1.43 - 0.323}}$ ----- 42= _____

43. $\sqrt{311} + \sqrt{78 + 246} - (\pi)\sqrt{281}$ ----- 43= _____

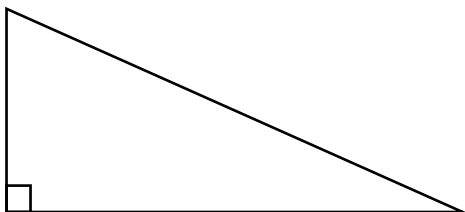
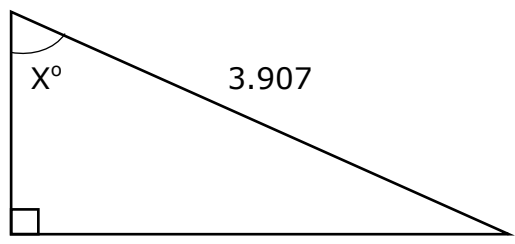
44. $(1/(0.00156))(91300 - 69200)^3$ ----- 44= _____

45. $(17600) \sqrt[3]{44400 + 53500 - 28500}$ ----- 45= _____

46. $[\sqrt{(864/750)(7920)}]^4$ ----- 46= _____

47. Boot Busters was having a 50% off sale. Phillip bought a pair of boots and with 6.25% tax he paid \$218.75. Calculate the price of the boots he bought if they were not on sale without tax. ----- 47=\$ _____

48. Calculate $(-2351)^{571}$. ----- 48= _____

<p>49. RIGHT TRIANGLE</p>  <p style="text-align: center;">8255</p> <p style="text-align: center;">10221</p> <p style="text-align: center;">Perimeter = ?</p> <p>49= _____</p>	<p>50. RIGHT TRIANGLE</p>  <p style="text-align: center;">1.221</p> <p style="text-align: center;">3.907</p> <p style="text-align: center;">X° = ?</p> <p>50= _____</p>
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51. $\left[\frac{659 + 1440 + \sqrt{1.48 \times 10^6 + 1.38 \times 10^6}}{932/608} \right]^2$ ----- 51= _____

52. $\frac{(2.87 \times 10^5 + 2.55 \times 10^5 - 44100)^4}{\sqrt{35.4 + 51.9 + 54.1}}$ ----- 52= _____

53. $\left[\frac{\sqrt{\sqrt{36.3 - 36}}}{-(0.3 - 0.282)} \right]^2 [4.03 + 4.12]$ ----- 53= _____

54. $1950 + \sqrt{(450)(1870)} - (2220 + 2300)$ ----- 54= _____

55. $(0.0498)(3.99 \times 10^{10})^{1/3} - [(38.5)(216)]^{1/2}$ ----- 55= _____

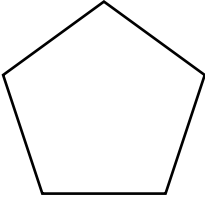
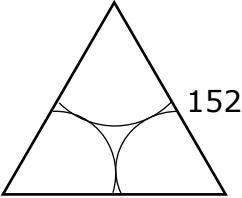
56. $\sqrt{\frac{1/(14 - 3.51)}{(63.3)(4.78 + 1.8)^6}}$ ----- 56= _____

57. $\sqrt{\frac{(490)(1.8)}{(36.6) + (26.9)}} + 1/(1.25)^{-6}$ ----- 57= _____

58. $\sqrt{\frac{1/(5740 - 2710)}{(1830)(2760 + 465)^{-4}}}$ ----- 58= _____

59. The radius of a right circular tank is 242 feet. The height of the cylinder is three times the diameter. Calculate the number of gallons this tank will hold. ----- 59= _____ gal.

60. Calculate the odds of rolling a standard die and having it land on a number greater than three. ----- 60= _____

<p>61. REGULAR PENTAGON</p> <div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: center;"> <p>Area = 775</p> <p>Side = ?</p> </div> </div> <p>61= _____</p>	<p>62. EQUILATERAL TRIANGLE AND EQUAL CIRCLE SECTORS</p> <div style="display: flex; justify-content: center; align-items: center;">  </div> <p style="text-align: center;">Area of triangle not covered by circle sectors = ?</p> <p>62= _____</p>
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63. $\frac{6!}{18!}$ ----- 63= _____

64. (deg) $(2.02 + 2.32)\sin(19.7^\circ)$ ----- 64= _____

65. (deg) $(181 - 38.8)\sin(74.8^\circ)$ ----- 65= _____

66. (rad) $\sin\left[\frac{(1.8)(\pi)}{(0.726)(389)}\right]$ ----- 66= _____

67. (deg) $\tan(394^\circ - 305^\circ) + 53.8$ ----- 67= _____

68. (deg) $\frac{\sin(0.796^\circ) - \tan(0.796^\circ)}{\sin(0.796^\circ)}$ ----- 68= _____

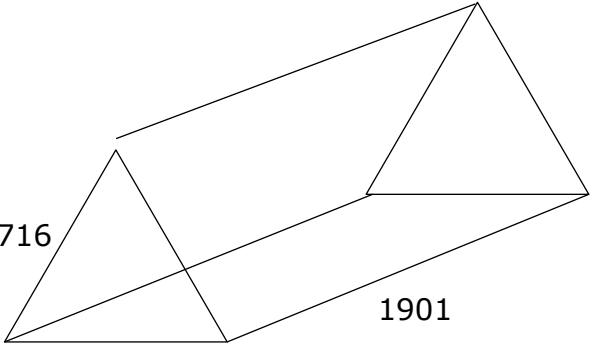
69. (rad) $(549)\tan(264)$ ----- 69= _____

70. $\left[(17.7)\left(\frac{8.68}{(101)(\pi)}\right)\right]^{5/2}$ ----- 70= _____

71. A certain bacteria in the lab tripled every month. If there were 1000 bacteria at first, calculate the number of bacteria after 6 months. 71= _____

72. Cammie saved up \$8,000 during high school. She is going to spend 5 years in the Peace Corps. If she deposits this money in an account at 7% interest compounded annually, calculate the amount of money she will come back to. ----- 72=\$ _____

73. EQUILATERAL TRIANGULAR PRISM



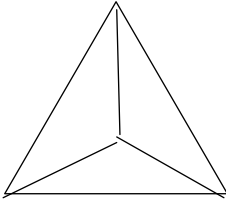
716

1901

Surface Area = ?

73= _____

74. REGULAR TETRAHEDRON



7.22

Volume = ?

74= _____

75. $\frac{0.854 + \sqrt{(4.37)(2.3) + (0.481)(1.59)}}{\sqrt{\sqrt{9.65 + 60.1}}}$ ----- 75= _____

76. $\ln\left[\frac{125 + 134 + 400}{389 + 273 - 58.2}\right]$ ----- 76= _____

77. $\log\sqrt{\frac{0.748 - 0.726}{(389)(4.74)}}$ ----- 77= _____

78. $(27.2)^\pi(0.873)^3(0.562 - 0.481)^2$ ----- 78= _____

79. $1 + 2 + 3 + \dots + 139$ ----- 79= _____

80. $(0.779) - \frac{(0.779)^2}{2} + \frac{(0.779)^3}{3} - \frac{(0.779)^4}{4}$ ----- 80= _____

2022 – 2023 TMSCA Middle School Calculator Test 6 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = 2060 = 2.06×10^3	14 = 2270 = 2.27×10^3	27 = -9190 = -9.19×10^3	39 = 3.61×10^{10}
2 = 2.20 = 2.20×10^0	15 = 3.94 = 3.94×10^0	28 = -6.42×10^7	40 = 1.71×10^{10}
3 = 215 = 2.15×10^2	16 = -0.116 = -1.16×10^{-1}	29 = 1.01×10^{-8}	41 = 3.20×10^{17}
4 = 23.9 = 2.39×10^1	17 = 1.58 = 1.58×10^0	30 = 2.23×10^9	42 = 0.0685 = 6.85×10^{-2}
5 = 1170 = 1.17×10^3	18 = 0.0408 = 4.08×10^{-2}	31 = 4.67×10^{-11}	43 = -17.0 = -1.70×10^1
6 = -18.0 = -1.80×10^1	19 = -3070 = -3.07×10^3	32 = 0.0585 = 5.85×10^{-2}	44 = 6.92×10^{15}
7 = -3.62 = -3.62×10^0	20 = 0.104 = 1.04×10^{-1}	33 = 7.11×10^6	45 = 723000 = 7.23×10^5
8 = 4.45 = 4.45×10^0	21 = 4.53 = 4.53×10^0	34 = -12.7 = -1.27×10^1	46 = 8.32×10^7
9 = 1.02×10^6	22 = -19.8 = -1.98×10^1		
10 = 3.69×10^{10}	23 = 0.0776 = 7.76×10^{-2}	35 = 1.73×10^7	47 = \$411.76
11 = 92.1 = 9.21×10^1	24 = 39.7 = 3.97×10^1	36 = 17.8 = 1.78×10^1	48 = -9.67×10^{1924}
12 = 30400 = 3.04×10^4	25 = 3 INT.	37 = 1.00×10^9	49 = 31600 = 3.16×10^4
13 = 211 INT.	26 = 488 = 4.88×10^2	38 = 169 = 1.69×10^2	50 = 71.8 = 7.18×10^1

2022 – 2023 TMSCA Middle School Calculator Test 6 Answer Key

Page 5

$$51 = 6.11 \times 10^6$$

$$52 = 5.17 \times 10^{21}$$

$$53 = 13800 \\ = 1.38 \times 10^4$$

$$54 = -1650 \\ = -1.65 \times 10^3$$

$$55 = 79.0 \\ = 7.90 \times 10^1$$

$$56 = 0.000136 \\ = 1.36 \times 10^{-4}$$

$$57 = 7.54 \\ = 7.54 \times 10^0$$

$$58 = 4420 \\ = 4.42 \times 10^3$$

$$59 = 2.00 \times 10^9$$

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

Page 6

$$61 = 21.2 \\ = 2.12 \times 10^1$$

$$62 = 931 \\ = 9.31 \times 10^2$$

$$63 = 1.12 \times 10^{-13}$$

$$64 = 1.46 \\ = 1.46 \times 10^0$$

$$65 = 137 \\ = 1.37 \times 10^2$$

$$66 = 0.0200 \\ = 2.00 \times 10^{-2}$$

$$67 = 111 \\ = 1.11 \times 10^2$$

$$68 = -9.65 \times 10^{-5}$$

$$69 = 58.5 \\ = 5.85 \times 10^1$$

$$70 = 0.163 \\ = 1.63 \times 10^{-1}$$

$$71 = 729000 \\ = 7.29 \times 10^5$$

$$72 = \$11220.41$$

Page 7

$$73 = 4530000 \\ = 4.53 \times 10^6$$

$$74 = 44.4 \\ = 4.44 \times 10^1$$

$$75 = 1.66 \\ = 1.66 \times 10^0$$

$$76 = 0.0875 \\ = 8.75 \times 10^{-2}$$

$$77 = -2.46 \\ = -2.46 \times 10^0$$

$$78 = 140 \\ = 1.40 \times 10^2$$

$$79 = 9730 \\ = 9.73 \times 10^3$$

$$80 = 0.541 \\ = 5.41 \times 10^{-1}$$

TMSCA 2022-2023 MS CA Test 6 Solutions to Word and Geometry Problems

11.

$$\frac{89 + 95 + 92 + 88 + 85 + 98 + 98}{7}$$

12. Side = $\frac{795}{3}$; Area = $\frac{s^2\sqrt{3}}{4}$

$$A = \frac{\left(\frac{795}{3}\right)^2\sqrt{3}}{4}$$

13. $400 - 21(9)$

24. Harmonic mean:

Reciprocal of the average of reciprocals. Find the sum of the reciprocals.

$\frac{1}{15} + \frac{1}{25} + \frac{1}{35} + \frac{1}{45} + \frac{1}{55} + \frac{1}{65} + \frac{1}{75} + \frac{1}{85} + \frac{1}{95}$. Divide this sum by 9. Then find the reciprocal.

25. Jane = J ; Abby = $3J$
 $3J + 8 + J + 8 = 28$
 $4J = 12; J = 3$

26. Many calculators have conversion keys. Otherwise
 $16(12)(2.54)$

35. When a linear measure is halved, the volume is $\left(\frac{1}{2}\right)^3$ as much.
 $(1.38 \times 10^8) \left(\frac{1}{2}\right)^3$

36. $\sqrt{(4 - -7)^2 + (-8 - 6)^2}$

37. $C = 2\pi r = 112233$

$$r = \frac{112233}{2\pi}$$

$A = \pi r^2 = \pi \left(\frac{112233}{2\pi}\right)^2$

38. x = half of major axis

$$\pi \left(\frac{73.8}{2}\right) x = 9796$$

$$x = \frac{9796(2)}{73.8\pi}$$

Major axis =

$$2 \left(\frac{9796(2)}{73.8\pi}\right)$$

47. x = half price before tax.

$1.0625x = 218.75$

$$x = \frac{218.75}{1.0625}$$

Original full price = $2x$

$$2x = 2 \left(\frac{218.75}{1.0625}\right)$$

48. 571 2351

(Look at the digits to the left of the decimal. This gives 1924 for the exponent. Write down 10^{1924} .) Then punch

1924

(This gives 9.67 E0 which is the first part of your answer.

The answer is -9.67×10^{1924}). Notice the negative. That was determined mentally. A negative raised to an odd power is negative. This is done on the HP RPN calculator.

49. Hypotenuse:

$$\sqrt{8255^2 + 10221^2}$$

$P = 8255 + 10221 + \sqrt{8255^2 + 10221^2}$

50. $\cos x = \frac{1.221}{3.907}$
 $x = \arccos\left(\frac{1.221}{3.907}\right)$

59. Change to inches

$242(12) = \text{radius} = 2904$

$2(242)(12) = \text{diameter} = 5808$

$2(242)(12)(3) = \text{height} = 17424$

$V = \pi r^2 h =$

$\pi(2904)^2(17424) \text{ in}^3$

$231 \text{ in}^3 = 1 \text{ gal.}$

$$\frac{\pi(2904)^2(17424)}{231}$$

60. Odds: $\frac{\text{successes}}{\text{failures}}$
 $\frac{3}{3}$

61. Area of regular polygon:

$$\frac{\text{perimeter}^2}{\left(\tan \frac{180}{n}\right) 4n}$$

$$775 = \frac{p^2}{\left(\tan \frac{180}{5}\right) 20}$$

$$p^2 = 775 \left\{ \left(\tan \frac{180}{5}\right) 20 \right\}$$

$$p = \sqrt{775 \left\{ \left(\tan \frac{180}{5}\right) 20 \right\}}$$

Divide the above by 5 to get one side of the pentagon.

62. Triangle minus

semicircle;

$$\text{radius} = \frac{152}{2} = 76$$

$$\frac{152^2\sqrt{3}}{4} - \frac{1}{2}\pi(76)^2$$

71. $1000(3)^6$

72. $8000(1.07)^5$

73. 2 Eq. triangles:

$$2\left(\frac{716^2\sqrt{3}}{4}\right)$$

3 rectangles: $3(716)(1901)$

Find the sum of the triangles and rectangles.

74. $\frac{\text{side}^3}{6\sqrt{2}} = \frac{7.22^3}{6\sqrt{2}}$