

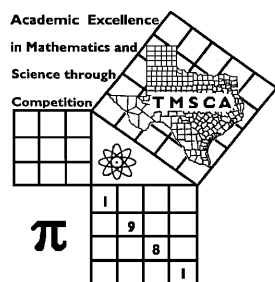
1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ <b>Final Score</b>
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

## 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 # 1 ©

OCTOBER 22, 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<sup>0\*</sup>, 1.23x10<sup>1</sup>, 1.23x10<sup>01</sup>, .0190, 1.90x10<sup>-2</sup>

Incorrect: 12.30, 123.0, 1.23(10)<sup>2</sup>, 1.23·10<sup>2</sup>, 1.230x10<sup>2</sup>, 1.23\*10<sup>2</sup>, 0.19, 1.9x10<sup>-2</sup>, 19.0x10<sup>-3</sup>, 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 1

1.  $976 - 487$  ----- 1= \_\_\_\_\_

2.  $1.5 + 3 + 7$  ----- 2= \_\_\_\_\_

3.  $5240 - 4530 + 1780$  ----- 3= \_\_\_\_\_

4.  $18 + 22 - 24 - 43$  ----- 4= \_\_\_\_\_

5.  $-1940 + 1660 + 1190 + 1000$  ----- 5= \_\_\_\_\_

6.  $293 + 133 - 122 - 323 - 84$  ----- 6= \_\_\_\_\_

7.  $0.768 + 1.9 + 1.16 + 1.19 + 0.262$  ----- 7= \_\_\_\_\_

8.  $(1.54 + 0.886 - 0.654) - (0.711 + 1.55)$  ----- 8= \_\_\_\_\_

9.  $61.7 \times 436 \times 361$  ----- 9= \_\_\_\_\_

10.  $4600 \times 828 \times 101 \times 5160$  ----- 10= \_\_\_\_\_

11. Martha has \$225.71 in her bank account. She spent \$35.21 on gas, \$85.92 in groceries, \$22.72 for make-up and deposited her paycheck for \$895.22. Calculate the balance of her bank account after these transactions. ----- 11=\$ \_\_\_\_\_

12. Calculate the area of a square with side lengths of three and eighty-one thousandths centimeters. ----- 12= \_\_\_\_\_ cm<sup>2</sup>

13. Two hundred fifty-seven is eighty-five percent of what number? 13= \_\_\_\_\_

14.  $(33)[16 \times 51/62]$  ----- 14= \_\_\_\_\_

15.  $(268/112)[318 - 357]$  ----- 15= \_\_\_\_\_

16.  $\{(419)(169 - 634)(145)\} - 1.04 \times 10^7$  ----- 16= \_\_\_\_\_

17.  $\left[\frac{55}{104}\right] [(52/83) + 0.317]$  ----- 17= \_\_\_\_\_

18.  $\frac{[3.19/(0.51)]/0.0182}{(0.026 \times 0.0237)(363)}$  ----- 18= \_\_\_\_\_

19.  $\left[\frac{(24.4 + 24.1)}{113/25}\right] \left[\frac{5.64}{0.0356}\right]$  ----- 19= \_\_\_\_\_

20.  $\frac{50}{(198 - 158)} - \frac{(241 - 318)}{243}$  ----- 20= \_\_\_\_\_

21.  $\frac{0.0572 + 0.0653 + 0.0524}{(0.0121)(15.2)(66700)}$  ----- 21= \_\_\_\_\_

22.  $\frac{(1280 \times 3030)/766}{(1070 \times 0.0788) + 63.3}$  ----- 22= \_\_\_\_\_

23.  $\frac{(938 + 1160 - 1830)}{\{(0.0103 - 0.00457)/(0.156)\}}$  ----- 23= \_\_\_\_\_

24. Calculate the number of ounces in a fifty-five gallon drum. ----- 24= \_\_\_\_\_ oz.

25. A weed killer concentrate needs to be mixed at a rate of 2.25 ounces per two quarts of water. Calculate the amount of concentrate needed for two gallons of water. ----- 25= \_\_\_\_\_ oz.

26. A strip of rubber, ten inches long, was formed to make a circular wheel for a model car. Calculate the radius of the wheel. ----- 26= \_\_\_\_\_ in.

27.  $\frac{(6.74 \times 10^6) + (1.31 \times 10^7)}{(-5.58)(3.96) - 17.6}$  ----- 27 = \_\_\_\_\_

28.  $(219)[(12.9/14.8)(6.13/9.36)]$  ----- 28 = \_\_\_\_\_

29.  $(0.258)[(4.03 \times 10^{-4} / 1.87 \times 10^{-4})(0.0933 + 0.103)]$  ----- 29 = \_\_\_\_\_

30.  $\frac{(0.595 + 0.749)}{(5.87 \times 10^{10})}$  ----- 30 = \_\_\_\_\_

31.  $[0.447] \left[ \frac{1/10.8}{1/3.3} \right]$  ----- 31 = \_\_\_\_\_

32.  $(0.192) \left[ \frac{0.00521}{(1.88 \times 10^{11})} \right]$  ----- 32 = \_\_\_\_\_

33.  $\frac{1}{20} - \frac{1}{137} + \frac{1}{55.2}$  ----- 33 = \_\_\_\_\_

34.  $\frac{1}{99.1} - \frac{1}{(14 + 115)}$  ----- 34 = \_\_\_\_\_

35. A store owner purchased an item for \$72.50. Calculate the price of the item in the store, if the owner wants to make a 33 1/3% profit. ----- 35 = \$ \_\_\_\_\_

36. In the month of June 2021 my family drove 825 miles. In June 2022, my family drove only 585 miles because of gas prices. Calculate the percent change in miles driven from June 2021 to June 2022. --- 36 = \_\_\_\_\_ %

37.

TRAPEZOID

22

33

Area = ?

37 = \_\_\_\_\_

38.

PARALLELOGRAM

5.7

X

Perimeter = 35

X = ?

38 = \_\_\_\_\_

39.  $(0.0678 + 0.132 + 0.0906)^2(0.238 + 0.464)^2$  ----- 39= \_\_\_\_\_

40.  $\left[ \frac{6170 + (1/(1.73 \times 10^{-4}))}{(8080/9230) - 0.531} \right]^2$  ----- 40= \_\_\_\_\_

41.  $\frac{(82200 + 64100)^2}{(0.406 - 0.196)^3}$  ----- 41= \_\_\_\_\_

42.  $\sqrt{82.8} + \sqrt{74.1 + 41.1} - (\pi)\sqrt{11}$  ----- 42= \_\_\_\_\_

43.  $(1/\pi)^4 \sqrt[4]{\frac{0.0199 + 0.00509}{0.348 - 0.307}}$  ----- 43= \_\_\_\_\_

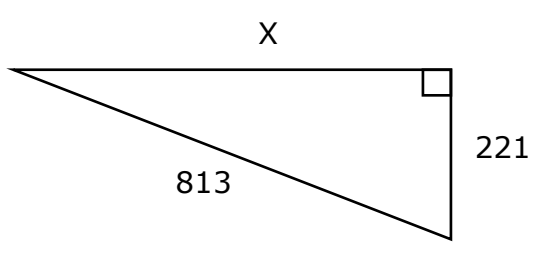
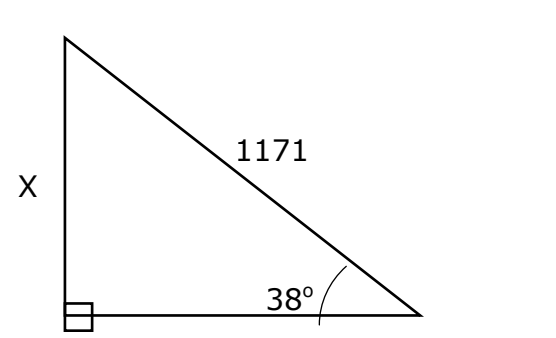
44.  $(1/(0.00209))(3120 - 1750)^3$  ----- 44= \_\_\_\_\_

45.  $\frac{(46.2 + 144)^{1/3}}{(16 - 3.72)^{1/5}}$  ----- 45= \_\_\_\_\_

46.  $\frac{1}{\sqrt{4110 + 4200 + 1870}} + \left(\frac{1}{\sqrt{20.4}}\right)^3$  ----- 46= \_\_\_\_\_

47. The lengths of the sides of a triangle are 6, 6, 10. If the length of the of the longest side of a similar triangle is 55, calculate the perimeter of the larger triangle. ----- 47= \_\_\_\_\_

48. A rectangle has the length of its dimensions decreased by 25%. Calculate the percent decrease in area. ----- 48= \_\_\_\_\_ %

<p>49. RIGHT TRIANGLE</p>  <p style="text-align: center;">X = ?</p> <p>49= _____</p>	<p>50. RIGHT TRIANGLE</p>  <p style="text-align: center;">X = ?</p> <p>50= _____</p>
---	--

51.  $\frac{\sqrt{1.02 + \pi + 0.173}}{(3.07 - 2.89 + 2.89)^4}$  ----- 51= \_\_\_\_\_

52.  $\left[ \frac{361 - 204 + \sqrt{2.64 \times 10^6 / 108}}{-4040 + 7010} \right]^{-2}$  ----- 52= \_\_\_\_\_

53.  $\left[ \frac{302 + 815 + \sqrt{6.69 \times 10^5 + 1.03 \times 10^6}}{9.35 / 11.7} \right]^2$  ----- 53= \_\_\_\_\_

54.  $\sqrt{\frac{1/(34.1 - 32.6)}{(82.5)(71.5 + 74.2)^4}}$  ----- 54= \_\_\_\_\_

55.  $\sqrt{\frac{(1.41 \times 10^5)(1.16 \times 10^5)}{(19700)(79600)}} - 1.5 + 2.46$  ----- 55= \_\_\_\_\_

56.  $(28.4)(2.50 \times 10^8)^{1/3} - [(1.53 \times 10^6)(2.68 \times 10^6)]^{1/3}$  ----- 56= \_\_\_\_\_

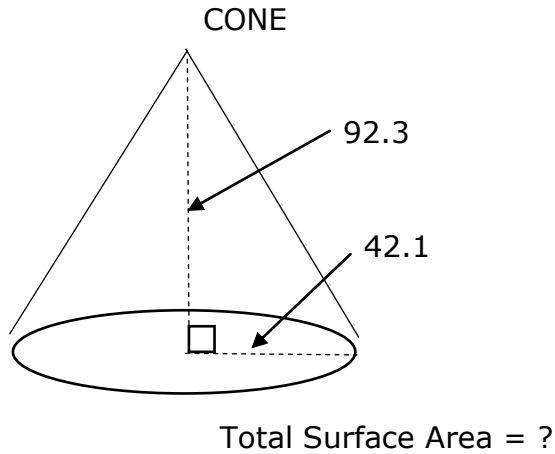
57.  $(\text{rad}) \sin(39.8) + (57.7/84.8)$  ----- 57= \_\_\_\_\_

58.  $\sqrt{\frac{1/(16.8 - 13.5)}{(351)(3190 + 5240)^2}}$  ----- 58= \_\_\_\_\_

59. Calculate the final temperature when 25.8 L of water at 58.7°C is mixed with 58.2 L of water at 92.5°C. ----- 59= \_\_\_\_\_ °C

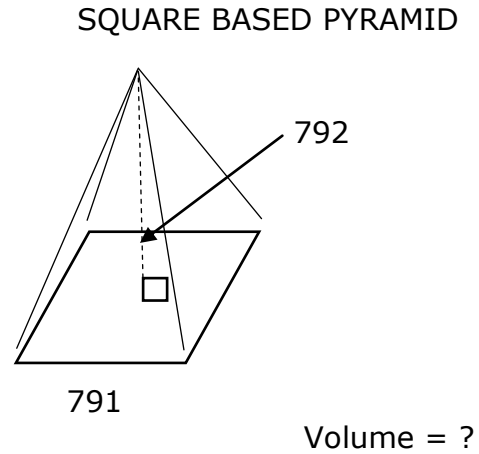
60. A single card is drawn from a standard deck of cards. Calculate the probability the card is an ace or a heart. ----- 60= \_\_\_\_\_

61.



61= \_\_\_\_\_

62.



62= \_\_\_\_\_

63.  $\frac{21!/28!}{6! + 7!}$  ----- 63= \_\_\_\_\_

64. (deg)  $(290 - 167)\cos(88.5^\circ)$  ----- 64= \_\_\_\_\_

65. (deg)  $\frac{\sin(72.8^\circ)}{1010}$  ----- 65= \_\_\_\_\_

66. (deg)  $(43.9 - 262)\sin(4.66^\circ) + 14.4$  ----- 66= \_\_\_\_\_

67. (rad)  $\cos\left[\frac{(7.51)(\pi)}{(17.1)(1.59)}\right]$  ----- 67= \_\_\_\_\_

68. (deg)  $\frac{\sin(214^\circ)}{\tan(214^\circ)}[465]$  ----- 68= \_\_\_\_\_

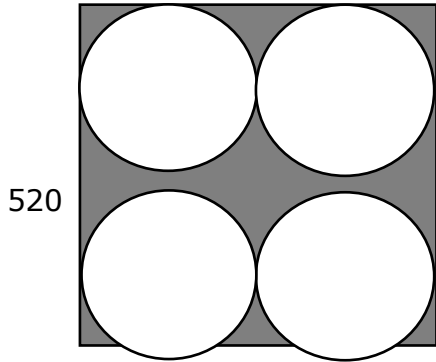
69. (deg)  $\frac{\tan(47.5^\circ)}{1060 + 1200}$  ----- 69= \_\_\_\_\_

70.  $(272 + 297 + 274)^{2/5}$  ----- 70= \_\_\_\_\_

71. Two complementary angles are in the ratio of 7:5. Calculate the measure of the larger angle in degrees. ----- 71= \_\_\_\_\_°

72. Jordan has 5 sweaters and 7 skirts. Calculate the number of different outfits of sweater/skirt that can be worn. ----- 72= \_\_\_\_\_ INT.

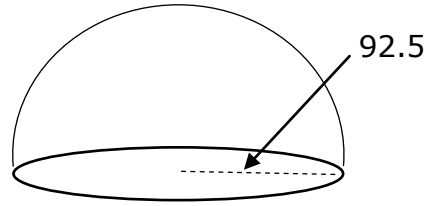
73. SQUARE AND CONGRUENT CIRCLES



Shaded Area = ?

73= \_\_\_\_\_

74. HEMISPHERE



Surface Area = ?

74= \_\_\_\_\_

75.  $\frac{\text{Log}(3.25 + 0.961)}{83.1 - 88.3}$  ----- 75= \_\_\_\_\_

76.  $\frac{13.6 + \sqrt{(1.86)(11.9) + (3.23)(12.5)}}{\sqrt{\sqrt{0.00209 + 0.00876}}}$  ----- 76= \_\_\_\_\_

77.  $2\text{Log}\sqrt{\frac{(1.24)(1.67)}{3.75 + 1.5}}$  ----- 77= \_\_\_\_\_

78.  $\text{Ln}\left[\frac{68.5 + 245 + 42.2}{2880 - 392 - 476}\right]$  ----- 78= \_\_\_\_\_

79.  $1 + 2 + 3 + \dots + 641$  ----- 79= \_\_\_\_\_

80.  $1 + \frac{(0.79)^4}{2} - \frac{(0.79)^6}{6} + \frac{(0.79)^8}{24} - \frac{(0.79)^{10}}{120}$  ----- 80= \_\_\_\_\_



## 2022 – 2023 TMSCA Middle School Calculator Test 1 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = 489 = $4.89 \times 10^2$	14 = 434 = $4.34 \times 10^2$	27 = -500000 = $-5.00 \times 10^5$	39 = 0.0416 = $4.16 \times 10^{-2}$
2 = 11.5 = $1.15 \times 10^1$	15 = -93.3 = $-9.33 \times 10^1$	28 = 125 = $1.25 \times 10^2$	40 = $1.20 \times 10^9$
3 = 2490 = $2.49 \times 10^3$	16 = $-3.87 \times 10^7$	29 = 0.109 = $1.09 \times 10^{-1}$	41 = $2.31 \times 10^{12}$
4 = -27.0 = $-2.70 \times 10^1$	17 = 0.499 = $4.99 \times 10^{-1}$	30 = $2.29 \times 10^{-11}$	42 = 9.41 = $9.41 \times 10^0$
5 = 1910 = $1.91 \times 10^3$	18 = 1540 = $1.54 \times 10^3$	31 = 0.137 = $1.37 \times 10^{-1}$	43 = 0.281 = $2.81 \times 10^{-1}$
6 = -103 = $-1.03 \times 10^2$	19 = 1700 = $1.70 \times 10^3$	32 = $5.32 \times 10^{-15}$	44 = $1.23 \times 10^{12}$
7 = 5.28 = $5.28 \times 10^0$	20 = 1.57 = $1.57 \times 10^0$	33 = 0.0608 = $6.08 \times 10^{-2}$	45 = 3.48 = $3.48 \times 10^0$
8 = -0.489 = $-4.89 \times 10^{-1}$	21 = $1.43 \times 10^{-5}$	34 = 0.00234 = $2.34 \times 10^{-3}$	46 = 0.0208 = $2.08 \times 10^{-2}$
9 = $9.71 \times 10^6$	22 = 34.3 = $3.43 \times 10^1$		
10 = $1.98 \times 10^{12}$	23 = 7300 = $7.30 \times 10^3$	35 = \$96.67	47 = 121 = $1.21 \times 10^2$
11 = \$977.08	24 = 7040 = $7.04 \times 10^3$	36 = -29.1 = $-2.91 \times 10^1$	48 = 43.8 = $4.38 \times 10^1$
12 = 9.49 = $9.49 \times 10^0$	25 = 9.00 = $9.00 \times 10^0$	37 = 160 = $1.60 \times 10^2$	49 = 782 = $7.82 \times 10^2$
13 = 302 = $3.02 \times 10^2$	26 = 1.59 = $1.59 \times 10^0$	38 = 11.8 = $1.18 \times 10^1$	50 = 721 = $7.21 \times 10^2$

## 2022 – 2023 TMSCA Middle School Calculator Test 1 Answer Key

### Page 5

$$51 = 0.0234 \\ = 2.34 \times 10^{-2}$$

$$52 = 89.8 \\ = 8.98 \times 10^1$$

$$53 = 9.17 \times 10^6$$

$$54 = 4.23 \times 10^{-6}$$

$$55 = 4.19 \\ = 4.19 \times 10^0$$

$$56 = 1890 \\ = 1.89 \times 10^3$$

$$57 = 1.54 \\ = 1.54 \times 10^0$$

$$58 = 3.49 \times 10^{-6}$$

$$59 = 82.1 \\ = 8.21 \times 10^1$$

$$60 = 0.308 \\ = 3.08 \times 10^{-1}$$

### Page 6

$$61 = 19000 \\ = 1.90 \times 10^4$$

$$62 = 1.65 \times 10^8$$

$$63 = 2.91 \times 10^{-14}$$

$$64 = 3.22 \\ = 3.22 \times 10^0$$

$$65 = 0.000946 \\ = 9.46 \times 10^{-4}$$

$$66 = -3.32 \\ = -3.32 \times 10^0$$

$$67 = 0.647 \\ = 6.47 \times 10^{-1}$$

$$68 = -386 \\ = -3.86 \times 10^2$$

$$69 = 0.000483 \\ = 4.83 \times 10^{-4}$$

$$70 = 14.8 \\ = 1.48 \times 10^1$$

$$71 = 52.5 \\ = 5.25 \times 10^1$$

$$72 = 35 \text{ INT.}$$

### Page 7

$$73 = 58000 \\ = 5.80 \times 10^4$$

$$74 = 80600 \\ = 8.06 \times 10^4$$

$$75 = -0.120 \\ = -1.20 \times 10^{-1}$$

$$76 = 182 \\ = 1.82 \times 10^2$$

$$77 = -0.404 \\ = -4.04 \times 10^{-1}$$

$$78 = -1.73 \\ = -1.73 \times 10^0$$

$$79 = 206000 \\ = 2.06 \times 10^5$$

$$80 = 1.16 \\ = 1.16 \times 10^0$$

TMSCA 2022-2023 MS CA Test 1 Solutions to Word and Geometry Problems

**11.**  
 $225.71 - 35.21 - 85.92 - 22.72$   
 $+ 895.22$

**12.**  $(3.081)^2$

**13.**  $\frac{85}{100} = \frac{257}{x}; x = \frac{257(100)}{85}$

**24.**  $55(128)$

**25.**  $\frac{2.25 \text{ oz}}{2Q} = \frac{x}{8Q}; x = \frac{2.25(8)}{2}$

**26.**  $C = 2\pi r$  so  $r = \frac{C}{2\pi}$   
 $r = \frac{10}{2\pi}$

**35.**  $33\frac{1}{3}\% = \frac{1}{3}$   
 $72.50 + \frac{1}{3}(72.50)$   
 OR  $72.50\left(1\frac{1}{3}\right)$

**36.** On the HP calculator:  
 Punch 825 enter, 585 % chg  
 Otherwise:  $\frac{585-825}{825} (100)$

**37.**  $h = \sqrt{8^2 - 5.5^2}$   
 $A = \frac{(22 + 33)h}{2}$   
 $\frac{(22 + 33)(\sqrt{8^2 - 5.5^2})}{2}$

**38.**  $\frac{35-5.7(2)}{2}$

**47.**  $\frac{6+6+10}{10} = \frac{P}{55}$   
 $P = \frac{55(22)}{10}$

**48.** If the dimensions are decreased by 25%, the new dimensions are 75% of the original. On HP  
 1 enter,  $(.75)^2$  % chg  
 Don't include the negative in the answer. The word "decrease" takes care of that.

**49.**  $\sqrt{813^2 - 221^2}$

**50.**  $\frac{\sin 38}{1} = \frac{x}{1171}$   
 $x = 1171(\sin 38)$

**59.**  $\frac{25.8(58.7)+58.2(92.5)}{25.8+58.2}$

**60.** 3 aces that are not hearts, 13 hearts in a deck of 52 cards

$$\frac{3 + 13}{52}$$

**61.** slant height:

$$l = \sqrt{42.1^2 + 92.3^2}$$

Surface Area:  
 $\pi r l + \pi r^2 =$   
 $\pi(42.1)\left(\sqrt{42.1^2 + 92.3^2}\right) + \pi(42.1)^2$

**62.**  $\frac{1}{3}(791)^2(792)$

**71.**  $7x + 5x = 90$   
 $x = \frac{90}{12}$ ; larger angle =  $7x$   
 $7\left(\frac{90}{12}\right)$

**72.**  $5(7)$

**73.** radius =  $\frac{520}{4} = 130$   
 A of square minus area of 4 circles:  
 $(520)^2 - 4\pi(130)^2$

**74.**  $SA = 3\pi r^2$   
 $3\pi(92.5)^2$

**79.**  $\frac{641(642)}{2}$

