

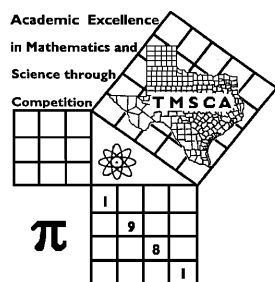
8 1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ <b>Final Score</b>
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

## 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 #5 ©

NOVEMBER 16, 2019

### GENERAL DIRECTIONS

**I. About this test:**

- A. You will be given 30 minutes to take this test. There are 80 problems on this test.
- B. ALL calculators must be cleared. HP Prime and Casio Prizm calculators are NOT permitted.**

**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<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.

**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.

**2019-2020 TMSCA Middle School Calculator Test #5**

1.  $643 - 1110$  ----- 1= \_\_\_\_\_

2.  $15 + 34 - 60$  ----- 2= \_\_\_\_\_

3.  $-2700 - 1660 + 3670$  ----- 3= \_\_\_\_\_

4.  $\pi - 27 - 25 - 17$  ----- 4= \_\_\_\_\_

5.  $-52 + 146 - 177 - 355$  ----- 5= \_\_\_\_\_

6.  $134 - 81.6 - 59.5 + 137 + 169$  ----- 6= \_\_\_\_\_

7.  $-0.281 + 1.14 - 0.608 + 1.34 + 0.452$  ----- 7= \_\_\_\_\_

8.  $0.19 - 1.33 + 1.37 - 1.24 - 0.802$  ----- 8= \_\_\_\_\_

9.  $142 \times 117 \times 213$  ----- 9= \_\_\_\_\_

10.  $187 \times 1180 \times 208 \times 933$  ----- 10= \_\_\_\_\_

11. The average of six numbers is 198.7. The average of another two numbers is 22.7. Calculate the overall average of the 8 numbers. 11= \_\_\_\_\_

12. Glen is sealing his fence in the back yard. He is going to seal both sides of the fence. There are 21- 6 foot by 8 foot panels. One gallon of sealant covers 350 square feet. Calculate the number of gallons needed to seal the whole fence. ----- 12= \_\_\_\_\_ gal (INT)

13. Gina purchased school supplies for the upcoming semester. She purchased a backpack for \$49.95, 6 loose leaf binders at \$2.99 each, 20 reams of paper at \$3.99 each and a package of pens for \$8.99. Calculate the total cost if there was a 6.25% sales tax. 13=\$ \_\_\_\_\_

14.  $(-77)[131 \times 71 \times 66]$  ----- 14= \_\_\_\_\_

15.  $(-217)[89 \times 189/135]$  ----- 15= \_\_\_\_\_

16.  $\{52/45\} \left[ \frac{311}{300 + 47} \right]$  ----- 16= \_\_\_\_\_

17.  $\left[ \frac{73}{51} \right] [(27/13) + 0.785]$  ----- 17= \_\_\_\_\_

18.  $\frac{[0.109/(0.165)]/0.709}{(6.65 \times 10^{-4} \times 4.84 \times 10^{-4})(1.12)}$  ----- 18= \_\_\_\_\_

19.  $\left[ \frac{68/59}{134/101} \right] \{0.327 + 0.229 - 1.6\}$  ----- 19= \_\_\_\_\_

20.  $(1.55)[68/132 \times 232/212] - 0.728$  ----- 20= \_\_\_\_\_

21.  $\frac{(1440)(282)}{0.0176} (0.00117 - 0.00108)$  ----- 21= \_\_\_\_\_

22.  $\frac{(\pi)(87/113)(95/67)}{(41/124)}$  ----- 22= \_\_\_\_\_

23.  $\left[ \frac{760 + 4610}{1880 - 4090} \right] \left[ \frac{5020}{2530} \right]$  ----- 23= \_\_\_\_\_

24. Calculate the harmonic mean of the first ten prime numbers. ---- 24= \_\_\_\_\_

25. Before a change was made in 2008, the official drag strip length was a quarter mile. Calculate the number of centimeters this is. ----- 25= \_\_\_\_\_ cm

26. The angles in a septagon are in the ratio of 4:5:4:3:6:4:5. Calculate the measure of the smallest angle in degrees. ----- 26= \_\_\_\_\_ °

27.  $\frac{(9.97 \times 10^7) + (4.86 \times 10^7)}{(-0.0093)(0.00657) - 5.10 \times 10^{-5}}$  ----- 27= \_\_\_\_\_

28.  $[573 - (607 + 759)] + [(-2.31)(754 - 538)]$  ----- 28= \_\_\_\_\_

29.  $(96.3)[(115/93.4)(0.00138 + 8.47 \times 10^{-4})]$  ----- 29= \_\_\_\_\_

30.  $\frac{1}{-1260} + \frac{1}{(\pi)(2540 - 4400)}$  ----- 30= \_\_\_\_\_

31.  $[0.00756] \left[ \frac{1/11.8}{1/(103)} \right]$  ----- 31= \_\_\_\_\_

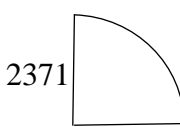
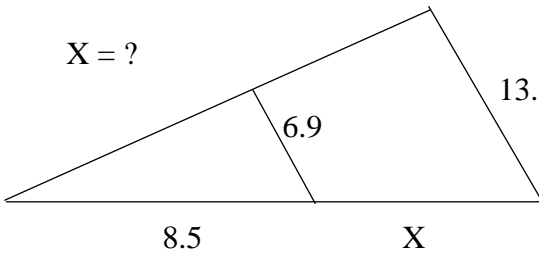
32.  $\frac{(5.84 + 6.22)}{(2.22 \times 10^{12})}$  ----- 32= \_\_\_\_\_

33.  $\left[ \frac{1/30.4}{1/21.7} \right] [1.45 \times 10^6]$  ----- 33= \_\_\_\_\_

34.  $\frac{1}{28.3} - \frac{1}{(91.2 + 56.8)}$  ----- 34= \_\_\_\_\_

35. As stated in problem number 25, the drag strip was changed from a quarter mile to 1000 feet. Calculate the percent change in the length of an official drag strip. ----- 35= \_\_\_\_\_ %

36. Calculate the value of the 18<sup>th</sup> pentagonal number. ----- 36= \_\_\_\_\_ INT.

QUARTER CIRCLE	SIMILAR TRIANGLES
 <p style="text-align: center;">2371</p> <p style="text-align: center;">Perimeter = ?</p>	 <p style="text-align: center;">X = ?</p> <p style="text-align: center;">6.9</p> <p style="text-align: center;">13.8</p> <p style="text-align: center;">8.5                      X</p>
37= _____	38= _____

39.  $(223 + 109 + 126)^2(0.678 + 1.55)^2$  ----- 39= \_\_\_\_\_

40.  $\left[ \frac{1990 + (1/(4.75 \times 10^{-4}))}{(2630/2360) - 0.776} \right]^2$  ----- 40= \_\_\_\_\_

41.  $(0.307 + 0.308)^2(110 + 88.9)^2$  ----- 41= \_\_\_\_\_

42.  $(1/\pi)^4 \sqrt[4]{\frac{0.012 + 0.00181}{0.0504 - 0.028}}$  ----- 42= \_\_\_\_\_

43.  $(1/(0.00451))(1460 - 167)^2$  ----- 43= \_\_\_\_\_

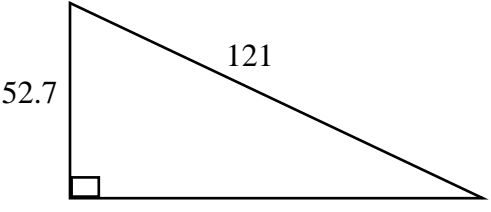
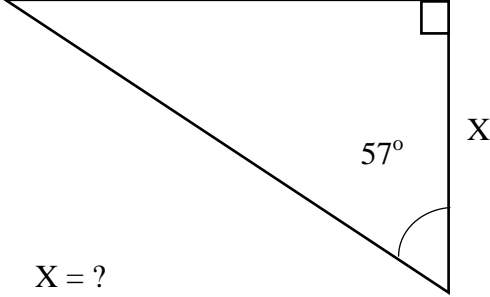
44.  $(7430)\sqrt{3890 + 4320 + 4610}$  ----- 44= \_\_\_\_\_

45.  $(19600)\sqrt{301 + 284 - 216}$  ----- 45= \_\_\_\_\_

46.  $\frac{(85.4 + 115)^{1/2}}{(4850 - 3780)^{1/3}}$  ----- 46= \_\_\_\_\_

47. Cynthia has been collecting quarters and dimes. She has 199 coins and the value is \$28.45. Calculate the number of dimes. - 47= \_\_\_\_\_ INT.

48. A triangle has a base of 37 inches and a height of 19 inches. Calculate the side of a square with the same area. ----- 48= \_\_\_\_\_ in.

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

51.  $\left[ \frac{\sqrt{\sqrt{14000 - 10400}}}{-(461 - 265)} \right]^3 [2.61 \times 10^5 + 2.57 \times 10^5]$  ----- 51= \_\_\_\_\_

52.  $\frac{(1920 + 5460 - 5250)^4}{\sqrt{22600 + 30800 + 25200}}$  ----- 52= \_\_\_\_\_

53.  $\frac{\sqrt{7.01 + \pi + 5.01}}{(1430 - 3620 + 2410)^4}$  ----- 53= \_\_\_\_\_

54.  $(3.84)(9.03 \times 10^8)^{1/4} - [(559)(4020)]^{1/2}$  ----- 54= \_\_\_\_\_

55.  $898 + \sqrt{(224)(599)} - (495 + 619)$  ----- 55= \_\_\_\_\_

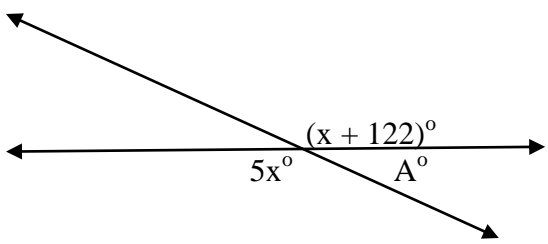
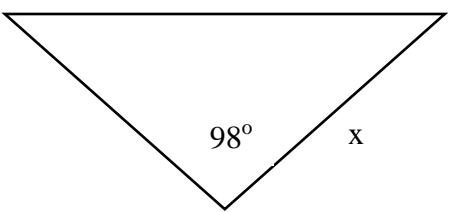
56.  $\sqrt{\frac{1/(138 - 65.7)}{(133)(624 + 344)^6}}$  ----- 56= \_\_\_\_\_

57.  $\sqrt{\frac{(2370)(5.31)}{(145) + (460)}} + 1/(0.603)^3$  ----- 57= \_\_\_\_\_

58.  $\sqrt{\frac{(103)(5190)}{(838) + (827)}} - 57$  ----- 58= \_\_\_\_\_

59. Two angles form a linear pair. The first angle measures  $(18x + 2)^\circ$  and the second angle measures  $(14x - 7)^\circ$ . Calculate the measure of the smaller angle. ----- 59= \_\_\_\_\_<sup>o</sup>

60. Sherry invested \$9000 at 2.75% simple interest for one year. Calculate the interest rate needed to earn the same interest on \$7500 in one year simple interest. ----- 60= \_\_\_\_\_%

<p style="text-align: center;"><b>INTERSECTING LINES</b></p>  <p style="text-align: center;"><math>A^\circ = ?</math></p> <p>61= _____</p>	<p style="text-align: center;"><b>ISOSCELES TRIANGLE</b></p>  <p style="text-align: center;"><math>x = ?</math></p> <p>62= _____</p>
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63.  $\frac{4!}{17!}$  ----- 63= \_\_\_\_\_

64.  $(138 - \pi)e^{0.747}$  ----- 64= \_\_\_\_\_

65.  $(\text{deg}) \frac{\tan(0.249^\circ)}{1480}$  ----- 65= \_\_\_\_\_

66.  $(\text{deg}) \tan(27.7^\circ - 31.7^\circ) + 0.0558$  ----- 66= \_\_\_\_\_

67.  $(\text{deg}) [279]\tan(292^\circ - 665^\circ)$  ----- 67= \_\_\_\_\_

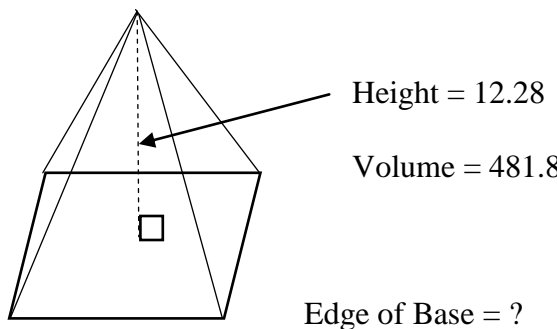
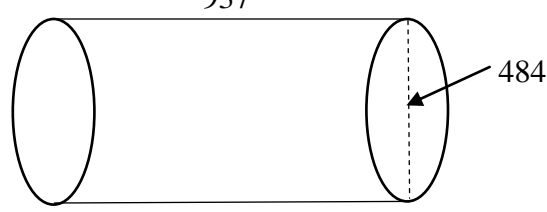
68.  $(\text{deg}) \frac{\sin(3.24^\circ) - \tan(3.24^\circ)}{\sin(3.24^\circ)}$  ----- 68= \_\_\_\_\_

69.  $(\text{rad}) (103)\tan(89.1)$  ----- 69= \_\_\_\_\_

70.  $(475 - 126)^{0.397} - 0.119$  ----- 70= \_\_\_\_\_

71. Calculate the product of the roots of the quadratic equation  
 $72 = 5x^2 - 18x$  ----- 71= \_\_\_\_\_

72. If the probability of an event happening is 8/17, calculate the odds of the event happening. ----- 72= \_\_\_\_\_

<p style="text-align: center;"><b>SQUARE BASED PYRAMID</b></p>  <p style="text-align: right;">Height = 12.28 Volume = 481.8</p> <p style="text-align: right;">Edge of Base = ?</p> <p>73= _____</p>	<p style="text-align: center;"><b>CYLINDER</b></p>  <p style="text-align: center;">937</p> <p style="text-align: right;">484</p> <p style="text-align: right;">Volume = ?</p> <p>74= _____</p>
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75.  $\frac{0.00261 + \sqrt{(0.0103)(0.00443)} + (0.0119)(0.0916)}{\sqrt{\sqrt{0.977 + 0.868}}}$  ----- 75= \_\_\_\_\_

76.  $\frac{(0.924)^{0.946}(21)^{0.552}}{(2.31 - 0.804)^{-6}}$  ----- 76= \_\_\_\_\_

77.  $\frac{242 - 540}{\text{Log}(76.3 + 77.8)}$  ----- 77= \_\_\_\_\_

78.  $\frac{(e^{0.384})(e^{0.299})(e^{0.657})}{\text{Ln}(3.56 + 1.68)}$  ----- 78= \_\_\_\_\_

79.  $2 + 4 + 6 + \dots + 946$  ----- 79= \_\_\_\_\_

80.  $(0.2) - \frac{(0.2)^2}{2} + \frac{(0.2)^3}{3} - \frac{(0.2)^4}{4}$  ----- 80= \_\_\_\_\_



## 2019-2020 TMSCA Middle School Calculator Test #5 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = -467 = $-4.67 \times 10^2$	14 = $-4.73 \times 10^7$	27 = $-1.32 \times 10^{12}$	39 = $1.04 \times 10^6$
2 = -11.0 = $-1.10 \times 10^1$	15 = -27000 = $-2.70 \times 10^4$	28 = -1290 = $-1.29 \times 10^3$	40 = $1.46 \times 10^8$
3 = -690 = $-6.90 \times 10^2$	16 = 1.04 = $1.04 \times 10^0$	29 = 0.264 = $2.64 \times 10^{-1}$	41 = 15000 = $1.50 \times 10^4$
4 = -65.9 = $-6.59 \times 10^1$	17 = 4.10 = $4.10 \times 10^0$	30 = -0.000965 = $-9.65 \times 10^{-4}$	42 = 0.282 = $2.82 \times 10^{-1}$
5 = -438 = $-4.38 \times 10^2$	18 = $2.58 \times 10^6$	31 = 0.0660 = $6.60 \times 10^{-2}$	43 = $3.71 \times 10^8$
6 = 299 = $2.99 \times 10^2$	19 = -0.907 = $-9.07 \times 10^{-1}$	32 = $5.43 \times 10^{-12}$	44 = 841000 = $8.41 \times 10^5$
7 = 2.04 = $2.04 \times 10^0$	20 = 0.146 = $1.46 \times 10^{-1}$	33 = $1.04 \times 10^6$	45 = 377000 = $3.77 \times 10^5$
8 = -1.81 = $-1.81 \times 10^0$	21 = 2080 = $2.08 \times 10^3$	34 = 0.0286 = $2.86 \times 10^{-2}$	46 = 1.38 = $1.38 \times 10^0$
9 = $3.54 \times 10^6$	22 = 10.4 = $1.04 \times 10^1$	35 = -24.2 = $-2.42 \times 10^1$	47 = 142 INT.
10 = $4.28 \times 10^{10}$	23 = -4.82 = $-4.82 \times 10^0$	36 = 477 INT.	48 = 18.7 = $1.87 \times 10^1$
11 = 155 = $1.55 \times 10^2$	24 = 6.52 = $6.52 \times 10^0$	37 = 8470 = $8.47 \times 10^3$	49 = 2870 = $2.87 \times 10^3$
12 = 6 INT.	25 = 40200 = $4.02 \times 10^4$	38 = 8.50 = $8.50 \times 10^0$	50 = 3720 = $3.72 \times 10^3$
13 = \$166.47	26 = 87.1 = $8.71 \times 10^1$		

## 2019-2020 TMSCA Middle School Calculator Test #5 Answer Key

### Page 5

$$51 = -32.0$$
$$= -3.20 \times 10^1$$

$$52 = 7.34 \times 10^{10}$$

$$53 = 1.66 \times 10^{-9}$$

$$54 = -833$$
$$= -8.33 \times 10^2$$

$$55 = 150$$
$$= 1.50 \times 10^2$$

$$56 = 1.12 \times 10^{-11}$$

$$57 = 9.12$$
$$= 9.12 \times 10^0$$

$$58 = -39.1$$
$$= -3.91 \times 10^1$$

$$59 = 73.9$$
$$= 7.39 \times 10^1$$

$$60 = 3.30$$
$$= 3.30 \times 10^0$$

### Page 6

$$61 = 27.5$$
$$= 2.75 \times 10^1$$

$$62 = 286$$
$$= 2.86 \times 10^2$$

$$63 = 6.75 \times 10^{-14}$$

$$64 = 285$$
$$= 2.85 \times 10^2$$

$$65 = 2.94 \times 10^{-6}$$

$$66 = -0.0141$$
$$= -1.41 \times 10^{-2}$$

$$67 = -64.4$$
$$= -6.44 \times 10^1$$

$$68 = -0.00160$$
$$= -1.60 \times 10^{-3}$$

$$69 = 221$$
$$= 2.21 \times 10^2$$

$$70 = 5.09$$
$$= 5.09 \times 10^0$$

$$71 = -14.4$$
$$= -1.44 \times 10^1$$

$$72 = 0.889$$
$$= 8.89 \times 10^{-1}$$

### Page 7

$$73 = 10.8$$
$$= 1.08 \times 10^1$$

$$74 = 1.72 \times 10^8$$

$$75 = 0.00897$$
$$= 8.97 \times 10^{-3}$$

$$76 = 58.1$$
$$= 5.81 \times 10^1$$

$$77 = -136$$
$$= -1.36 \times 10^2$$

$$78 = 2.31$$
$$= 2.31 \times 10^0$$

$$79 = 224000$$
$$= 2.24 \times 10^5$$

$$80 = 0.182$$
$$= 1.82 \times 10^{-1}$$