

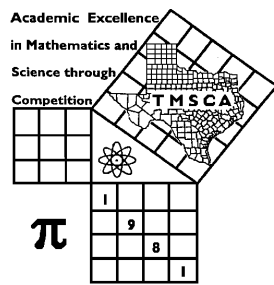
8 1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ Final Score
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

PLACE LABEL BELOW

Name: _____ School: _____

SS/ID Number: _____ City: _____

Grade: 5 6 7 8 Classification: 1A 2A 3A 4A 5A 6A



TMSCA MIDDLE SCHOOL CALCULATOR

TEST #5 ©

NOVEMBER 18, 2017

GENERAL DIRECTIONS

I. About this test:

- A. You will be given 30 minutes to take this test.
- B. There are 80 problems on this test.

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^{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.

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.

2017-2018 TMSCA Middle School Calculator Test 5

1. $1550 + 1470$ ----- 1= _____
2. $12 + 21 - 15$ ----- 2= _____
3. $23 - 147 + 90$ ----- 3= _____
4. $19 + 78 + 42 + 54$ ----- 4= _____
5. $-5910 + 6720 + 3340 + 6020$ ----- 5= _____
6. $-93.6 + 131 - 82.3 - 185 - 159$ ----- 6= _____
7. $(-0.199 - 0.403) + (1.42 - 1.2 - 0.575)$ ----- 7= _____
8. $-3.31 + 3.11 - 2.19 + 1.62 + 0.709$ ----- 8= _____
9. $57.6 \times 117 \times 99.8$ ----- 9= _____
10. $202 \times 173 \times 111 \times 297$ ----- 10= _____
11. The average of eight numbers is 217.6. The average of another three numbers is 578.2. Calculate the overall average. ----- 11= _____
12. Sherry is painting the guest room in her house. The room is 10 feet by 15 feet with standard 8 foot ceilings. It has 2, 6.5 foot by 2.5 foot doors, and 2, 3 foot by 4.5 foot windows. If a gallon can of paint covers 450 square feet, calculate the number of cans needed to paint the room with 2 coats. ----- 12= _____ INT.
13. Bill bought toys to donate to the toy drive. He bought 5 plush animals for \$3.99 each, 7 dolls for \$7.29 each and 7 toy trucks for \$5.79 each. If there was 6.75% tax, calculate the total cost of the toys. ----- 13=\$ _____

14. $(85/80)[65 - 98]$ ----- 14= _____

15. $(149)[345 \times 413 \times 351]$ ----- 15= _____

16. $\left[\frac{152}{232}\right][(78/152) - 0.108]$ ----- 16= _____

17. $\left[\frac{47}{151}\right][(51/109) + 0.375]$ ----- 17= _____

18. $\left[\frac{183/39}{93/130}\right] \{75 + 169 - 145\}$ ----- 18= _____

19. $\frac{(166/587) + (496/238)}{(0.487 - 0.719)}$ ----- 19= _____

20. $\frac{(\pi)(4/2)(6/12)}{92}$ ----- 20= _____

21. $(0.107)[182/140 \times 92/129] - 0.0367$ ----- 21= _____

22. $\left[\frac{3700 + 3720}{755 - 5310}\right] \left[\frac{1190}{5250}\right]$ ----- 22= _____

23. $\frac{(0.0911 + 0.0702 - 0.0411)}{\{(8.06 \times 10^{-4} - 0.00126)/(41)\}}$ ----- 23= _____

24. Calculate the harmonic mean of the 2 digit even palindrome numbers. ----- 24= _____

25. 100 yards is the length of a football field. Convert this to centimeters. ----- 25= _____ cm

26. The angles in a pentagon are in the ratio of 1.5:4.5:2:3:5. Calculate the measure of the largest angle. ----- 26= _____ °

27. $[552 - (1860 + 1550)] + [(0.461)(785 - 1780)]$ ----- 27= _____

28. $(0.0119)[(2.63/3.22)(0.306/0.471)]$ ----- 28= _____

29. $\frac{(2.17 \times 10^6) + (9.77 \times 10^6)}{(-3.8)(4.96) - 12.3}$ ----- 29= _____

30. $\frac{1}{-22.5} + \frac{1}{(\pi)(76.1 - 84.6)}$ ----- 30= _____

31. $(48.5)[(2.21 \times 10^8) - (6.10 \times 10^7)]$ ----- 31= _____

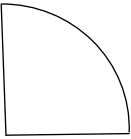
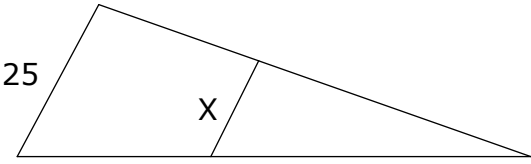
32. $[0.303] \left[\frac{1/\pi}{1/3.38} \right]$ ----- 32= _____

33. $\left[\frac{1/28.7}{1/57.6} \right] [3.35 \times 10^6]$ ----- 33= _____

34. $\frac{1}{409} - \frac{1}{(335 + 196)}$ ----- 34= _____

35. Jim and Lane work together to complete a task in 8 hours. If Jim is gone, it take Lane 12.5 hours to complete the task. Calculate how long it would take Jim to do the task if Lane is gone. ----- 35= _____ hrs.

36. Calculate the value of the 15th hexagonal number. ----- 36= _____ INT.

QUARTER CIRCLE	SIMILAR TRIANGLES
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">8725</div>  </div> <p style="text-align: center; margin-top: 20px;">Perimeter = ?</p> <p>37= _____</p>	 <p style="text-align: right; margin-top: 20px;">X = ?</p> <p>38= _____</p>

39. $\left[\frac{10000 + (1/(2.97 \times 10^{-5}))}{(28000/6270) - 1.63} \right]^2$ ----- 39= _____

40. $(2.78 + 4.48 + 3.5)^2(7350 + 2120)^2$ ----- 40= _____

41. $\left[\frac{155}{0.975} \right](1270 + 5710)^2$ ----- 41= _____

42. $\sqrt{(310/779) + 0.388 - 0.349}$ ----- 42= _____

43. $\sqrt{70.3} + \sqrt{93.7 + 25.9} - (\pi)\sqrt{42.7}$ ----- 43= _____

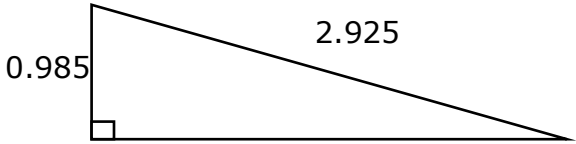
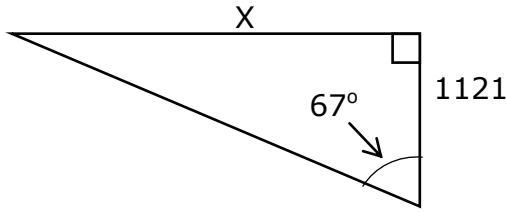
44. $(1/(0.00806))(46300 - 14700)^2$ ----- 44= _____

45. $\frac{1}{\sqrt{1370 + 3020 + 3620}} + \left(\frac{1}{\sqrt{17}} \right)^3$ ----- 45= _____

46. $\sqrt{0.678 - 215/621} + 1/\sqrt{6 + 4.34}$ ----- 46= _____

47. A collection of 115 nickels and half-dollars is worth \$15.65.
 Calculate the number of nickels. ----- 47= _____ INT.

48. A right triangle has a base of 72 inches and a height of 102 inches.
 Calculate the radius of a circle with the same area. ----- 48= _____ in.

<p style="text-align: center;">RIGHT TRIANGLE</p>  <p style="text-align: center;">Area = ?</p> <p>49= _____</p>	<p style="text-align: center;">RIGHT TRIANGLE</p>  <p style="text-align: center;">X = ?</p> <p>50= _____</p>
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51. $\frac{\sqrt{39.6 + \pi + 54.3}}{(265 - 1420 + 331)^3}$ ----- 51=_____

52. $\left[\frac{\sqrt{\sqrt{6290 - 3970}}}{-(0.453 - 3.66)}\right]^2 [0.0146 + 0.041]$ ----- 52=_____

53. $\left[\frac{4020 - 3200 + \sqrt{3.27 \times 10^7 / 54.8}}{-24.1 + 36.7}\right]^2$ ----- 53=_____

54. $0.385 + \sqrt{(3330)/(4860)} - (0.316 + 0.419)^2$ ----- 54=_____

55. $\sqrt{\frac{1/(8.42 - 3.54)}{(394)(154 + 47)^4}}$ ----- 55=_____

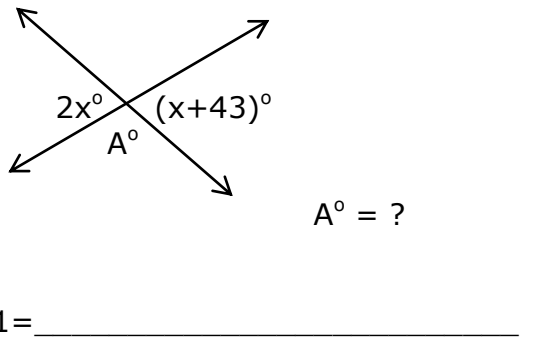
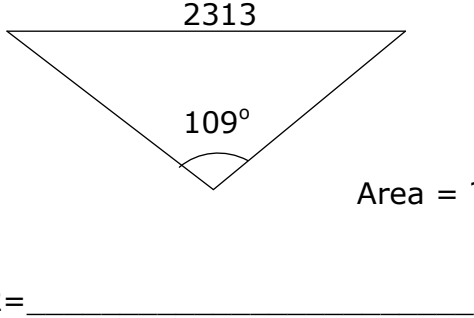
56. $(32.5)^2 \sqrt{(814)/(53.8)} - (4060 + 1700)$ ----- 56=_____

57. $\sqrt{\frac{(9310)(721)}{(4600) + (4100)}} + 1/(2.3)^{-4}$ ----- 57=_____

58. $\sqrt{\frac{(270)(59.5)}{(489) + (778)}} - 4.41$ ----- 58=_____

59. Two angles form a linear pair. The first angle measures $(22x-8)^\circ$ and the second angle measures $(8x+22)^\circ$. Calculate the measure of the larger angle in degrees. ----- 59=_____°

60. Tim invested \$7500 at 3% for one year. Calculate the interest rate needed to earn the same interest on \$5000 in one year. --- 60=_____%

<p style="text-align: center;">INTERSECTING LINES</p>  <p style="text-align: right;">$A^\circ = ?$</p> <p>61 = _____</p>	<p style="text-align: center;">ISOSCELES TRIANGLE</p>  <p style="text-align: right;">Area = ?</p> <p>62 = _____</p>
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63. $\frac{20!}{18!}$ ----- 63 = _____

64. $(7.4\pi)^{-4}(8.21 \times 10^{-6})^0(9.05 \times 10^{-4})^{-2}$ ----- 64 = _____

65. $(227 - \pi)e^{0.478}$ ----- 65 = _____

66. $(\text{deg}) (12.5 - 19.6)\cos(258^\circ) + 0.348$ ----- 66 = _____

67. $(\text{deg}) \sin(1.25^\circ - 0.986^\circ) + 0.00314$ ----- 67 = _____

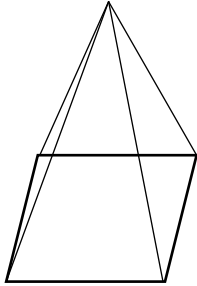
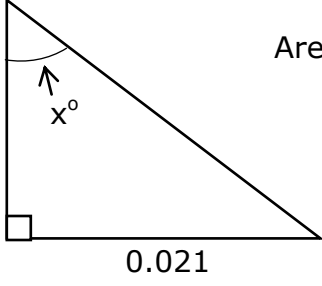
68. $(\text{deg}) \frac{\sin(9.33^\circ) - \tan(9.33^\circ)}{\sin(9.33^\circ)}$ ----- 68 = _____

69. $(\text{rad}) \sin[(0.43 - 0.493)(55.5)]$ ----- 69 = _____

70. $(830 + 1250 + 1230)^{3/5}$ ----- 70 = _____

71. Calculate the sum of the roots of the quadratic equation
 $12x - 4x^2 = 2$ ----- 71 = _____

72. If the odds of an event happening is 7/5, calculate the probability
of the event happening. ----- 72 = _____

<p style="text-align: center;">SQUARE BASE PYRAMID</p> <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  </div> <div style="text-align: left;"> <p>Height = 72.32</p> <p>Volume = 28212.61</p> <p>Edge of Base = ?</p> </div> </div> <p>73= _____</p>	<p style="text-align: center;">RIGHT TRIANGLE</p> <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  </div> <div style="text-align: left;"> <p>Area = 0.000357</p> <p>$x^\circ = ?$</p> </div> </div> <p>74= _____</p>
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75. $\frac{1.94 + \sqrt{(1.99)(\pi) + (1.04)(2.46)}}{\sqrt{\sqrt{24.7 + 28.9}}}$ ----- 75= _____

76. $\ln\left[\frac{273 + 585 + 94.3}{559 + 335 - 324}\right]$ ----- 76= _____

77. $\text{Log}(9.77 + 12.5 + 19.6)$ ----- 77= _____

78. $\frac{(e^{0.399})(e^{0.759})(e^{0.842})}{\text{Ln}(4.81 + 4.95)}$ ----- 78= _____

79. $1 + 2 + 3 + \dots + 321$ ----- 79= _____

80. $-\frac{1}{(7.9)} + \frac{1}{3(7.9)^3} - \frac{1}{5(7.9)^5} + \frac{1}{7(7.9)^7}$ ----- 80= _____

2017-2018 TMSCA Middle School Calculator Test 5 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = 3020 = 3.02×10^3	14 = -35.1 = -3.51×10^1	27 = -3320 = -3.32×10^3	39 = 2.37×10^8
2 = 18.0 = 1.80×10^1	15 = 7.45×10^9	28 = 0.00631 = 6.31×10^{-3}	40 = 1.04×10^{10}
3 = -34.0 = -3.40×10^1	16 = 0.265 = 2.65×10^{-1}	29 = -383000 = -3.83×10^5	41 = 7.75×10^9
4 = 193 = 1.93×10^2	17 = 0.262 = 2.62×10^{-1}	30 = -0.0819 = -8.19×10^{-2}	42 = 0.661 = 6.61×10^{-1}
5 = 10200 = 1.02×10^4	18 = 649 = 6.49×10^2	31 = 7.76×10^9	43 = -1.21 = -1.21×10^0
6 = -389 = -3.89×10^2	19 = -10.2 = -1.02×10^1	32 = 0.326 = 3.26×10^{-1}	44 = 1.24×10^{11}
7 = -0.957 = -9.57×10^{-1}	20 = 0.0341 = 3.41×10^{-2}	33 = 6.72×10^6	45 = 0.0254 = 2.54×10^{-2}
8 = -0.0610 = -6.10×10^{-2}	21 = 0.0625 = 6.25×10^{-2}	34 = 0.000562 = 5.62×10^{-4}	46 = 0.887 = 8.87×10^{-1}
9 = 673000 = 6.73×10^5	22 = -0.369 = -3.69×10^{-1}	35 = 22.2 = 2.22×10^1	47 = 93 INT.
10 = 1.15×10^9	23 = -10900 = -1.09×10^4	36 = 435 INT.	48 = 34.2 = 3.42×10^1
11 = 316 = 3.16×10^2	24 = 42.2 = 4.22×10^1	37 = 31200 = 3.12×10^4	49 = 1.36 = 1.36×10^0
12 = 2 INT.	25 = 9140 = 9.14×10^3	38 = 14.0 = 1.40×10^1	50 = 2640 = 2.64×10^3
13 = \$119.04	26 = 169 = 1.69×10^2		

2017-2018 TMSCA Middle School Calculator Test 5 Answer Key

Page 5

$$51 = -1.76 \times 10^{-8}$$

$$52 = 0.260 \\ = 2.60 \times 10^{-1}$$

$$53 = 16000 \\ = 1.60 \times 10^4$$

$$54 = 0.673 \\ = 6.73 \times 10^{-1}$$

$$55 = 5.64 \times 10^{-7}$$

$$56 = -1650 \\ = -1.65 \times 10^3$$

$$57 = 55.8 \\ = 5.58 \times 10^1$$

$$58 = -0.849 \\ = -8.49 \times 10^{-1}$$

$$59 = 114 \\ = 1.14 \times 10^2$$

$$60 = 4.50 \\ = 4.50 \times 10^0$$

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$$61 = 94.0 \\ = 9.40 \times 10^1$$

$$62 = 954000 \\ = 9.54 \times 10^5$$

$$63 = 380 \\ = 3.80 \times 10^2$$

$$64 = 4.18 \\ = 4.18 \times 10^0$$

$$65 = 361 \\ = 3.61 \times 10^2$$

$$66 = 1.82 \\ = 1.82 \times 10^0$$

$$67 = 0.00775 \\ = 7.75 \times 10^{-3}$$

$$68 = -0.0134 \\ = -1.34 \times 10^{-2}$$

$$69 = 0.348 \\ = 3.48 \times 10^{-1}$$

$$70 = 129 \\ = 1.29 \times 10^2$$

$$71 = 3.00 \\ = 3.00 \times 10^0$$

$$72 = 0.583 \\ = 5.83 \times 10^{-1}$$

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$$73 = 34.2 \\ = 3.42 \times 10^1$$

$$74 = 31.7 \\ = 3.17 \times 10^1$$

$$75 = 2.59 \\ = 2.59 \times 10^0$$

$$76 = 0.513 \\ = 5.13 \times 10^{-1}$$

$$77 = 1.62 \\ = 1.62 \times 10^0$$

$$78 = 3.24 \\ = 3.24 \times 10^0$$

$$79 = 51700 \\ = 5.17 \times 10^4$$

$$80 = -0.126 \\ = -1.26 \times 10^{-1}$$

TMSCA 17-18 MS CA Test #5 Solutions to Word and Geometry Problems

11.

$$\frac{217.6(8) + 578.2(3)}{11}$$

12. 4 walls = $8(10+15+10+15) = 400 \text{ ft}^2$

Doors: $2(6.5 \times 2.5) = 32.5$

Windows: $2(3 \times 4.5) = 27$

2 coats of paint

$$\frac{2(400 - 32.5 - 27)}{450} \approx 1.51$$

2 gallons of paint must be purchased.

13. $[5(3.99) + 7(7.29) + 7(5.79)][1.0675]$

24. 22,44,66,88 are the two digit even palindromes

Harmonic mean is the reciprocal of the average of the reciprocals.

$$\frac{1}{\left[\left(\frac{1}{22} + \frac{1}{44} + \frac{1}{66} + \frac{1}{88}\right) \div 4\right]}$$

25. 100 yds = 3600 in. On the RPN calculator there is a key to convert in. to cm.

26. Degrees in a pentagon:

$$180(n - 2) = 180(5 - 2) = 540.$$

$$1.5x + 4.5x + 2x + 3x + 5x = 540$$

$$x = 540/16. \text{ Largest angle is } 5x.$$

35. Short cut for 2 people working together:

$\frac{LJ}{L+J}$ = time when working together.

$$\frac{12.5J}{12.5+J} = 8$$

$$8(12.5 + J) = 12.5J; \text{ Solve for } J.$$

36. Hexagonal number:

$$\frac{n(4n-2)}{2} \text{ or } n(2n-1)$$

$$15(30-1) = 15(29)$$

$$\mathbf{37.} \quad \frac{1}{4}C + 2(8725)$$

$$\frac{1}{4}(2\pi(8725)) + 2(8725)$$

$$\mathbf{38.} \quad \frac{25}{32+41} = \frac{x}{41}$$

$$x = \frac{25(41)}{32 + 41}$$

$$\mathbf{47.} \quad \begin{cases} N + H = 115 \\ 5N + 50H = 1565 \end{cases}$$

$$\begin{cases} -50N - 50H = -5750 \\ 5N + 50H = 1565 \end{cases}$$

Add these together.

$$-45N = -4185$$

$$N = 93 \text{ INT}$$

$$\mathbf{48.} \text{ Triangle area} = \frac{102(72)}{2}$$

$$\text{Circle } A = \pi r^2 = \frac{102(72)}{2}$$

$$r = \sqrt{\frac{102(72)}{2\pi}}$$

49. long leg =

$$\sqrt{2.925^2 - .985^2}$$

$$A = \frac{\text{long leg}(.985)}{2}$$

50.

$$\frac{\tan 67}{1} = \frac{x}{1121}$$

$$x = 1121 \tan(67)$$

$$\mathbf{59.} \quad 22x - 8 + 8x + 22 = 180$$

$$30x + 14 = 180; x = \frac{166}{30}$$

$$22\left(\frac{166}{30}\right) - 14 = \text{larger angle}$$

$$\mathbf{60.} \quad P_1(r_1) = P_2(r_2)$$

$$7500(.03) = 5000x;$$

$$x = \frac{7500(.03)}{5000}$$

Times 100 to make a %

61. Vertical angles are congruent:

$$2x = x + 43; x = 43; 2x = 86. \text{ Angle A is supplementary to } 86.$$

$$180 - 86$$

62. To find height

$$\frac{\tan\left(\frac{109}{2}\right)}{1} = \frac{2313}{h}$$

$$h = \left(\frac{2313}{2} \div \tan\left(\frac{109}{2}\right)\right)$$

$$\text{Area} = \frac{(2313)(h)}{2}$$

$$\mathbf{71.} \quad -4x^2 + 12x - 2 = 0$$

Sum of roots:

$$-\frac{b}{a} = \frac{-12}{-4}$$

$$\mathbf{72.} \text{ Odds: } \frac{7}{5}$$

$$\text{Probability} = \frac{7}{12}$$

73. x = edge of Base; Volume

$$= \frac{1}{3}x^2(72.32) = 28212.61$$

$$x = \sqrt{\frac{28212.61(3)}{72.32}}$$

74.

$$.000357 = \frac{(.021)(h)}{2}$$

$$h = \frac{.000357(2)}{.021}$$

$$\frac{\tan x}{1} = \frac{.021}{.000357(2)}$$

$$x = \text{atan}\left(\frac{.021}{.000357(2)}\right)$$