



**2016-2017 TMSCA Middle School Calculator Test 5**

1.  $934 + 1610$  ----- 1= \_\_\_\_\_

2.  $-22 + 8 - 12$  ----- 2= \_\_\_\_\_

3.  $1240 - 2120 + 2930$  ----- 3= \_\_\_\_\_

4.  $13 - 17 - 12 - \pi$  ----- 4= \_\_\_\_\_

5.  $387 + 219 + 143 + 240$  ----- 5= \_\_\_\_\_

6.  $78 - 142 - 160 - 48.4 + 78.6$  ----- 6= \_\_\_\_\_

7.  $-0.965 + 0.863 - 0.192 + 1.13 + 1.44$  ----- 7= \_\_\_\_\_

8.  $(0.76 + 1.5 - 1.58) - (0.495 + 0.822)$  ----- 8= \_\_\_\_\_

9.  $113 \times 328 \times 200$  ----- 9= \_\_\_\_\_

10.  $463 \times 1220 \times 31.6 \times 326$  ----- 10= \_\_\_\_\_

11. The average of the first 6 numbers is 256.5. The average of the next 8 numbers is 199.7. Calculate the overall average. ----- 11= \_\_\_\_\_

12. A fence needs to be treated. Each 8 x 10 foot panel will need two coats. The fence has a total of fifteen panels. A one gallon can of sealant will cover 200 square feet. Calculate the number of cans of sealant needed to complete the job. ----- 12= \_\_\_\_\_ INT.

13. Terry purchased 5 RC toys for \$39.99 each, 2 dolls for \$22.67 each, 8 puzzles for \$5.89 each and 4 movies for \$12.99 each for the toy drive. If there was 6.25% tax added, calculate the total cost of the toys he bought. ----- 13= \$ \_\_\_\_\_

14.  $(111/190)[365 - 349]$  -----14= \_\_\_\_\_

15.  $(123)[317 \times 79 \times 191]$  -----15= \_\_\_\_\_

16.  $\left[\frac{-220}{192}\right][(164/59) - 0.915]$  -----16= \_\_\_\_\_

17.  $\{(434)(204 - 568)(322)\} - 1.87 \times 10^7$  -----17= \_\_\_\_\_

18.  $\frac{[1.82/(0.933)]/0.743}{(0.347 \times 0.105)(5.42 \times 10^{-4})}$  -----18= \_\_\_\_\_

19.  $\left[\frac{(0.0149 + 0.00904)}{222/32}\right] \left[\frac{0.0224}{0.00939}\right]$  -----19= \_\_\_\_\_

20.  $\frac{603}{(343 - 610)} - \frac{(168 - 463)}{602}$  -----20= \_\_\_\_\_

21.  $\frac{0.0636 + 0.047 + 0.045}{(7.33 \times 10^{-5})(38.2)(0.00738)}$  -----21= \_\_\_\_\_

22.  $\frac{(1090 \times 845)/249}{(1180 \times 702) + 4.36 \times 10^5}$  -----22= \_\_\_\_\_

23.  $\frac{(\pi)(129/31)(69/35)}{(18/137)}$  -----23= \_\_\_\_\_

24. The angles in a quadrilateral are in the ratio of 3:7:6:4. Calculate the measure of the smallest angle. -----24= \_\_\_\_\_°

25. Calculate the number of liters in a five gallon pail. -----25= \_\_\_\_\_ l

26. Calculate the harmonic mean of the first five prime numbers. -----26= \_\_\_\_\_

27.  $\frac{(192 + 143)(22.3 + 13.9)}{(7.30 \times 10^{11})}$  -----27= \_\_\_\_\_

28.  $[725 - (566 + 331)] + [(-0.656)(612 - 493)]$  -----28= \_\_\_\_\_

29.  $\frac{(1.02 \times 10^8) + (1.70 \times 10^7)}{(-0.222)(0.69) - 0.128}$  -----29= \_\_\_\_\_

30.  $\frac{(0.00269 + 0.0019)}{(9.06 \times 10^{10})}$  -----30= \_\_\_\_\_

31.  $(6.83) \left[ \frac{231}{(2.25 \times 10^{11})} \right]$  -----31= \_\_\_\_\_

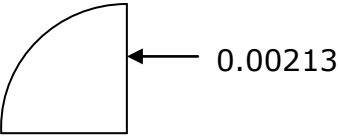
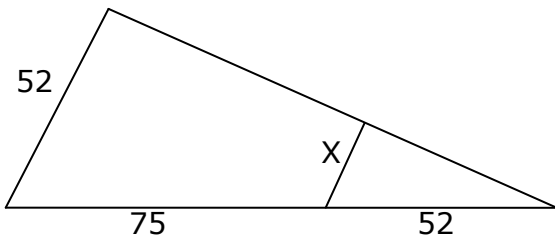
32.  $(\pi) [(1.17 \times 10^{12}) - (1.55 \times 10^{12})]$  -----32= \_\_\_\_\_

33.  $\frac{1}{8140} - \frac{1}{8690} + \frac{1}{2850}$  -----33= \_\_\_\_\_

34.  $\left[ \frac{1/3810}{1/3820} \right] [1.62 \times 10^6]$  -----34= \_\_\_\_\_

35. Ann and Andy can do the job in 5 hours. Andy alone can do the job in 8 hours. Calculate how long it would take Ann to do the job alone. -----35= \_\_\_\_\_ hrs.

36. Calculate the value of the 10<sup>th</sup> hexagonal number. -----36= \_\_\_\_\_ INT.

<p style="text-align: center;">Quarter Circle</p>  <p style="text-align: center;">Area = ?</p> <p>37= _____</p>	<p style="text-align: center;">Similar Triangles</p>  <p style="text-align: center;">X = ?</p> <p>38= _____</p>
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39.  $\frac{(60100 + 44800)^3}{(0.457 - 0.285)^2}$  -----39= \_\_\_\_\_

40.  $\left[\frac{283}{19}\right](0.87 + 0.509)^2$  -----40= \_\_\_\_\_

41.  $(5.61 + 17.4)^2(74.9 + 31.7)^2$  -----41= \_\_\_\_\_

42.  $(1/(0.0107))(77200 - 34300)^2$  -----42= \_\_\_\_\_

43.  $\sqrt{(318/648) + 0.378 - 0.128}$  -----43= \_\_\_\_\_

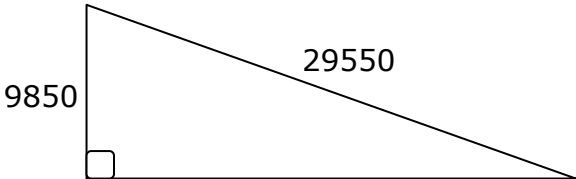
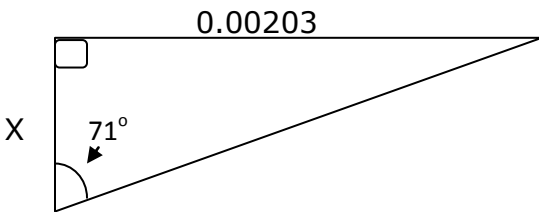
44.  $\sqrt{2170} + \sqrt{2180 + 1810} - (\pi)\sqrt{1320}$  -----44= \_\_\_\_\_

45.  $(2450)\sqrt{23.7 + 117 - 96.5}$  -----45= \_\_\_\_\_

46.  $[\sqrt{(563/4890)(150)}]^3$  -----46= \_\_\_\_\_

47. There is a pile of 157 quarters and dimes worth \$28.45. Calculate the number of quarters in the pile. -----47= \_\_\_\_\_ INT.

48. A right triangle has a base of 27 inches and a height of 19 inches. Calculate the base of another triangle with equal area and a base of 9 inches. -----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.  $\left[ \frac{283 - 209 + \sqrt{1.31 \times 10^6 / 374}}{-296 + 356} \right]^3$  -----51= \_\_\_\_\_

52.  $\left[ \frac{\sqrt{\sqrt{6620 - 5420}}}{-(0.0306 - 0.0234)} \right]^3 [979 + 3010]$  -----52= \_\_\_\_\_

53.  $\frac{(0.163 + 0.512 - 0.106)^2}{\sqrt{2.59 + 12.5 + 16.6}}$  -----53= \_\_\_\_\_

54.  $0.871 + \sqrt{(2360)/(1040)} - (0.537 + 0.599)^2$  -----54= \_\_\_\_\_

55.  $2070 + \sqrt{(1760)(423)} - (1850 + 582)$  -----55= \_\_\_\_\_

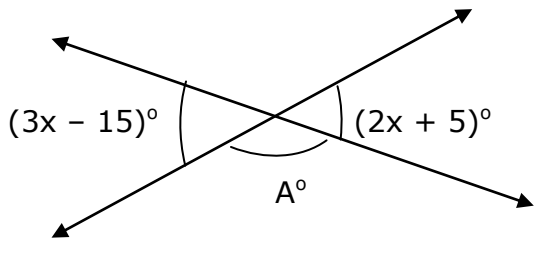
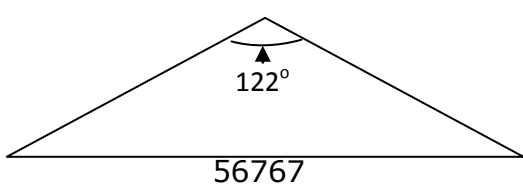
56.  $(239)(1.78 \times 10^{10})^{1/3} - [(2.82 \times 10^{11})(7.11 \times 10^{11})]^{1/4}$  -----56= \_\_\_\_\_

57.  $\sqrt{\frac{(24.8)(28.1)}{(16.7) + (5.19)}} + 1/(0.708)^5$  -----57= \_\_\_\_\_

58.  $\sqrt{\frac{(17.3)(153)}{(62.8) + (53.1)}} - 5.27$  -----58= \_\_\_\_\_

59. Two angles form a linear pair. One angle measures  $5x - 13$  and the other measures  $.33x + 7$ . Calculate the measure of the smaller angle. -----59= \_\_\_\_\_°

60. Calculate the amount that would have to be invested at 3% to make the same interest as \$5000 at  $7\frac{1}{4}\%$  simple interest in one year. -----60=\$ \_\_\_\_\_

<p style="text-align: center;">Intersecting lines</p>  <p style="text-align: center;"><math>A^\circ = ?</math></p> <p>61= _____</p>	<p style="text-align: center;">Isosceles Triangle</p>  <p style="text-align: center;">Area = ?</p> <p>62= _____</p>
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63.  $\frac{2! - 6!}{27!}$  ----- 63= \_\_\_\_\_

64.  $(74 - \pi)e^{0.581}$  ----- 64= \_\_\_\_\_

65.  $(\text{deg}) (390 + 143)\sin(2.38^\circ)$  ----- 65= \_\_\_\_\_

66.  $(\text{rad}) \tan\left[\frac{(3.74)(\pi)}{(5.77)(3.02)}\right]$  ----- 66= \_\_\_\_\_

67.  $(\text{rad}) \frac{\cos(3.84)}{1110/22.4}$  ----- 67= \_\_\_\_\_

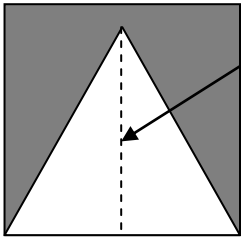
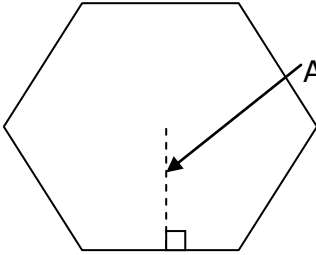
68.  $(\text{deg}) \frac{\tan(296^\circ)}{13.5 + 17.2}$  ----- 68= \_\_\_\_\_

69.  $(\text{deg}) \frac{\sin(180^\circ)}{\tan(180^\circ)}[3.72]$  ----- 69= \_\_\_\_\_

70.  $(1240 + 1350 + 783)^{1/5}$  ----- 70= \_\_\_\_\_

71. Calculate the value of the discriminant of the quadratic equation,  $4x^2 + 7x + 13 = 0$  ----- 71= \_\_\_\_\_

72. Calculate the odds of rolling a double on a pair of dice. ----- 72= \_\_\_\_\_

<p style="text-align: center;">Square and Equilateral Triangle</p>  <p style="text-align: right;">Height of Triangle = 27.58</p> <p style="text-align: right;">Shaded Area = ?</p> <p>73= _____</p>	<p style="text-align: center;">Regular Hexagon</p>  <p style="text-align: right;">Apothem = 11.04184</p> <p style="text-align: right;">Perimeter = 76.5</p> <p style="text-align: right;">Area = ?</p> <p>74= _____</p>
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75.  $\frac{\text{Log}(2.03 \times 10^{10} + 5.19 \times 10^{10})}{1.96}$  ----- 75= \_\_\_\_\_

76.  $\frac{\text{Log}(1220 + 805)}{53.4 - 62.1}$  ----- 76= \_\_\_\_\_

77.  $(3890)10^{(0.747)(4.62)}$  ----- 77= \_\_\_\_\_

78.  $(3.91)^\pi (0.37)^4 (140 - 79.8)^4$  ----- 78= \_\_\_\_\_

79.  $1 + 2 + 3 + \dots + 618$  ----- 79= \_\_\_\_\_

80.  $(0.4) - \frac{(0.4)^2}{2} + \frac{(0.4)^3}{3} - \frac{(0.4)^4}{4}$  ----- 80= \_\_\_\_\_



## 2016-2017 TMSCA Middle School Calculator Test 5 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = 2540 = $2.54 \times 10^3$	14 = 9.35 = $9.35 \times 10^0$	27 = $1.66 \times 10^{-8}$	39 = $3.90 \times 10^{16}$
2 = -26.0 = $-2.60 \times 10^1$	15 = $5.88 \times 10^8$	28 = -250 = $-2.50 \times 10^2$	40 = 28.3 = $2.83 \times 10^1$
3 = 2050 = $2.05 \times 10^3$	16 = -2.14 = $-2.14 \times 10^0$	29 = $-4.23 \times 10^8$	41 = $6.02 \times 10^6$
4 = -19.1 = $-1.91 \times 10^1$	17 = $-6.96 \times 10^7$	30 = $5.07 \times 10^{-14}$	42 = $1.72 \times 10^{11}$
5 = 989 = $9.89 \times 10^2$	18 = 133000 = $1.33 \times 10^5$	31 = $7.01 \times 10^{-9}$	43 = 0.861 = $8.61 \times 10^{-1}$
6 = -194 = $-1.94 \times 10^2$	19 = 0.00823 = $8.23 \times 10^{-3}$	32 = $-1.19 \times 10^{12}$	44 = -4.39 = $-4.39 \times 10^0$
7 = 2.28 = $2.28 \times 10^0$	20 = -1.77 = $-1.77 \times 10^0$	33 = 0.000359 = $3.59 \times 10^{-4}$	45 = 16300 = $1.63 \times 10^4$
8 = -0.637 = $-6.37 \times 10^{-1}$	21 = 7530 = $7.53 \times 10^3$	34 = $1.62 \times 10^6$	46 = 71.8 = $7.18 \times 10^1$
9 = $7.41 \times 10^6$	22 = 0.00293 = $2.93 \times 10^{-3}$	35 = 13.3 = $1.33 \times 10^1$	47 = 85 INT.
10 = $5.82 \times 10^9$	23 = 196 = $1.96 \times 10^2$	36 = 190 INT.	48 = 57.0 = $5.70 \times 10^1$
11 = 224 = $2.24 \times 10^2$	24 = 54.0 = $5.40 \times 10^1$	37 = $3.56 \times 10^{-6}$	49 = $1.37 \times 10^8$
12 = 12 INT.	25 = 18.9 = $1.89 \times 10^1$	38 = 21.3 = $2.13 \times 10^1$	50 = 0.000699 = $6.99 \times 10^{-4}$
13 = \$365.89	26 = 3.95 = $3.95 \times 10^0$		

## 2016-2017 TMSCA Middle School Calculator Test 5 Answer Key

### Page 5

$$\begin{aligned} 51 &= 10.9 \\ &= 1.09 \times 10^1 \\ 52 &= -2.18 \times 10^{12} \\ 53 &= 0.0575 \\ &= 5.75 \times 10^{-2} \\ 54 &= 1.09 \\ &= 1.09 \times 10^0 \\ 55 &= 501 \\ &= 5.01 \times 10^2 \\ 56 &= -45100 \\ &= -4.51 \times 10^4 \\ 57 &= 11.3 \\ &= 1.13 \times 10^1 \\ 58 &= -0.491 \\ &= -4.91 \times 10^{-1} \\ 59 &= 18.5 \\ &= 1.85 \times 10^1 \\ 60 &= \$12083.33 \end{aligned}$$

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$$\begin{aligned} 61 &= 135 \\ &= 1.35 \times 10^2 \\ 62 &= 4.47 \times 10^8 \\ 63 &= -6.59 \times 10^{-26} \\ 64 &= 127 \\ &= 1.27 \times 10^2 \\ 65 &= 22.1 \\ &= 2.21 \times 10^1 \\ 66 &= 0.799 \\ &= 7.99 \times 10^{-1} \\ 67 &= -0.0155 \\ &= -1.55 \times 10^{-2} \\ 68 &= -0.0668 \\ &= -6.68 \times 10^{-2} \\ 69 &= -3.72 \\ &= -3.72 \times 10^0 \\ 70 &= 5.08 \\ &= 5.08 \times 10^0 \\ 71 &= -159 \\ &= -1.59 \times 10^2 \\ 72 &= 0.200 \\ &= 2.00 \times 10^{-1} \end{aligned}$$

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$$\begin{aligned} 73 &= 575 \\ &= 5.75 \times 10^2 \\ 74 &= 422 \\ &= 4.22 \times 10^2 \\ 75 &= 5.54 \\ &= 5.54 \times 10^0 \\ 76 &= -0.380 \\ &= -3.80 \times 10^{-1} \\ 77 &= 1.10 \times 10^7 \\ 78 &= 1.78 \times 10^7 \\ 79 &= 191000 \\ &= 1.91 \times 10^5 \\ 80 &= 0.335 \\ &= 3.35 \times 10^{-1} \end{aligned}$$

TMSCA 16-17 MS CA Test #5 Solutions to Word and Geometry Problems

11.  $\frac{6(256.5) + 8(199.7)}{14}$

12.  $\frac{8(10)(2)(15)}{200}$

13.  $1.0625[39.99(5) + 22.67(2) + 5.89(8) + 12.99(4)]$   
See the SHOW key for cents.

24.  $3x + 7x + 6x + 4x = 360$   
 $20x = 360; x = 18$ . The smallest angle is  $3x$  or  $3(18)$

25. On RPN calculator, punch 5 right shift 2. This converts gallons to liters.

26. The harmonic mean is the reciprocal of the average of the reciprocals.

$$\frac{1}{\left(\frac{1}{2} + \frac{1}{3} + \frac{1}{5} + \frac{1}{7} + \frac{1}{11}\right) \div 5}$$

35. Shortcut formula for TWO people working together:

$\frac{ab}{a+b}$  where a and b are the times working alone.

$$\frac{8b}{8+b} = 5$$

$$8b = 40 + 5b; 3b = 40$$

$$b = \frac{40}{3}$$

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

$$\frac{10[4(10) - 2]}{2}$$

37.  $\frac{1}{4}\pi(.00213)^2$

38. Similar triangles  
 $\frac{52}{(75 + 52)} = \frac{x}{52}$

47.  $d + q = 157$   
 $10d + 25q = 2845$   
First equation times -10  
 $-10d - 10q = -1570$   
Add to 2<sup>nd</sup> equation  
 $15q = 1275; q = 1275/15$

48.  $\frac{27(19)}{2} = \frac{9x}{2}$  so  
 $x = \frac{27(19)}{9}$

49. long leg =  
 $\sqrt{29550^2 - 9850^2}$   
 $A = \frac{9850\sqrt{29550^2 - 9850^2}}{2}$

50.  $\frac{\tan 71}{1} = \frac{.00203}{x}$   
 $x = \frac{.00203}{\tan 71}$

59. A linear pair of angles add to be  $180^\circ$ .  
 $5x - 13 + .33x + 7 = 180$   
 $5.33x = 186; x = \frac{186}{5.33}$

The smaller angle is  
 $.33\left(\frac{186}{5.33}\right) + 7$

60.  $.03x = 5000(.0725)$   
 $x = \frac{5000(.0725)}{.03}$   
See the SHOW key for cents.

61.  $3x - 15 = 2x + 5;$   
 $x = 20; 3x - 15 = 60 - 15 = 45$   
Angle A is supplementary to  $45^\circ$ .  $180 - 45$

62. Drop an altitude from vertex to middle of base.  
Angle is  $61^\circ$ ,  $\frac{1}{2}$  base =  
 $56767/2$ . Use  $\frac{\tan 61}{1} = \frac{56767}{h}$   
Height =  $\frac{56767}{\tan 61}$   $A = \frac{bh}{2}$

71. Discriminant is  $b^2 - 4ac$   
Where  $a = 4, b = 7, c = 13$   
 $7^2 - 4(4)(13)$

72. There are 36 possible rolls on a pair of dice. Six of the rolls are doubles, 30 are not. Odds:  $\frac{6}{30}$

73. Side of square is  $\frac{27.58(2)}{\sqrt{3}}$   
Area of square =  $\left(\frac{27.58(2)}{\sqrt{3}}\right)^2$   
Area of triangle =  $\frac{h^2\sqrt{3}}{3}$   
$$\frac{27.58^2\sqrt{3}}{3}$$
  
Subtract triangle from square.

74.  $A = \frac{1}{2} aP$   
 $A = \frac{1}{2} (11.04184)(76.5)$