

2017-2018 TMSCA Middle School Calculator Test 13

1. $2390 + 2790$ ----- 1= _____

2. $75 - 56 + 53$ ----- 2= _____

3. $1280 + 473 - 220$ ----- 3= _____

4. $26 - 76 - 48 - 92$ ----- 4= _____

5. $443 + 514 - 393 - 508$ ----- 5= _____

6. $-156 + 196 - 120 - 178 + 176$ ----- 6= _____

7. $(1.6 - 0.864) + (5.24 - 3.63 - \pi)$ ----- 7= _____

8. $(0.961 + \pi - 2.46) - (0.967 + 0.356)$ ----- 8= _____

9. $101 \times 132 \times 114$ ----- 9= _____

10. $262 \times 83.7 \times 72.3 \times 3270$ ----- 10= _____

11. Calculate the sum of a perfect score on this test, the number of "stated and geometry" questions on this test and the number of minutes you have to take this test. ----- 11= _____ INT.

12. Alex completed #75 on his calculator test when time ran out. He had attempted all the problems up to that point but missed 12. Calculate her score. ` ----- 12= _____ INT.

13. Calculate the geometric mean of π , e^5 , and 10^4 . ----- 13= _____

14. $(659/768)[745 - 138]$ ----- 14= _____

15. $(-117)[163 \times 44/141]$ ----- 15= _____

16. $\{(774)(727 - 594)(765)\} - 2.22 \times 10^7$ ----- 16= _____

17. $\{225/551\} \left[\frac{76}{375 + 436} \right]$ ----- 17= _____

18. $\left[\frac{(502 + 630)}{95/149} \right] \left[\frac{0.00872}{0.00184} \right]$ ----- 18= _____

19. $\left[\frac{(1080/320) - (1280/277)}{9.99 \times 10^{-4} / 9.61 \times 10^{-4}} \right]$ ----- 19= _____

20. $\frac{98}{(161 - 160)} - \frac{(131 - 190)}{75}$ ----- 20= _____

21. $\frac{(1890)(0.245)}{46.8} (23.9 - 15.9)$ ----- 21= _____

22. $\frac{(\pi)(304/237)(192/275)}{(328/369)}$ ----- 22= _____

23. $\frac{[-(1480 + 1610)(1290 - 845)]}{(235/(71600))}$ ----- 23= _____

24. Phillip purchased an item that cost \$22.85. Sales tax of 6.75% was added. If he used just \$10 bills to pay, Calculate the change that he received. ----- 24=\$ _____

25. Mark weighs 14% more than Adam and Adam weighs 7% more than Montel. Calculate what percent Mark's weight is more than Montel's. ----- 25= _____ %

26. The lengths of the sides of a hexagon are in the ratio of 1:2:3:4:5:6 The length of the two longest sides total 98 m. Calculate the length of the shortest side. ----- 26= _____ m

27. $(0.0704)[(0.00435/0.00288)(3.51/3.23)]$ ----- 27= _____

28. $\frac{(253 - 264)(0.806 + 0.948)}{(2.58 \times 10^{11})}$ ----- 28= _____

29. $(67.2)[(180/181)(70.9 + 21.7)]$ ----- 29= _____

30. $\frac{1}{-142} + \frac{1}{(\pi)(544 - 671)}$ ----- 30= _____

31. $(0.116) \left[\frac{0.00542}{(9.11 \times 10^{-11})} \right]$ ----- 31= _____

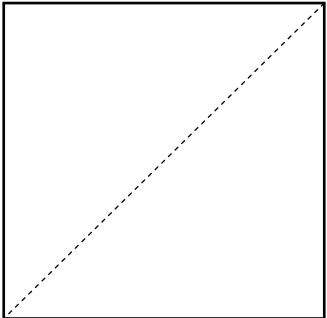
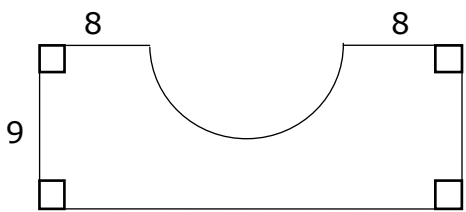
32. $[59.3] \left[\frac{1/0.352}{1/0.107} \right]$ ----- 32= _____

33. $\left[\frac{1/166}{1/320} \right] [1.01 \times 10^6]$ ----- 33= _____

34. $\left[\frac{1/216}{1/98.6} \right] + [0.461]$ ----- 34= _____

35. A septagon has interior angles in the ratio of 3:5:4:2:4:5:7.
 Calculate the measure of the smallest angle in degrees. ----- 35= _____°

36. A motorcyclist heads north from point A at an average of 55 mph at 10 AM. At noon, a motorist heads south from the same point. At 4 PM they are 500 miles apart. Calculate the speed of the car. 36= _____ mph

<p style="text-align: center;">SQUARE</p>  <p style="text-align: right;">Diagonal = 5.72×10^8</p> <p style="text-align: right;">Area = ?</p> <p>37= _____</p>	<p style="text-align: center;">RECTANGLE WITH SEMICIRCLE INDENT</p>  <p style="text-align: right;">Area = ?</p> <p>38= _____</p>
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39. $\left[\frac{0.399}{55.3}\right](1.66 + 0.709)^4$ ----- 39= _____

40. $(1.7 + 1.77)^2(202 + 238)^2$ ----- 40= _____

41. $\sqrt[4]{\frac{63.8 + 43.5}{45.9 - 40.4}}$ ----- 41= _____

42. $(1/\pi)\sqrt[4]{\frac{0.518 + 0.454}{0.499 - 0.475}}$ ----- 42= _____

43. $(3980)\sqrt{99.3 + 45.2 + 135}$ ----- 43= _____

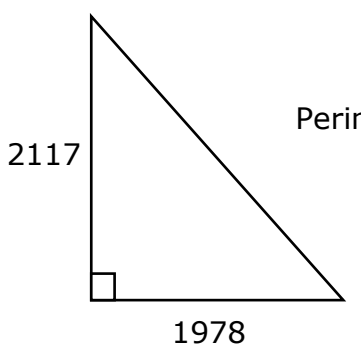
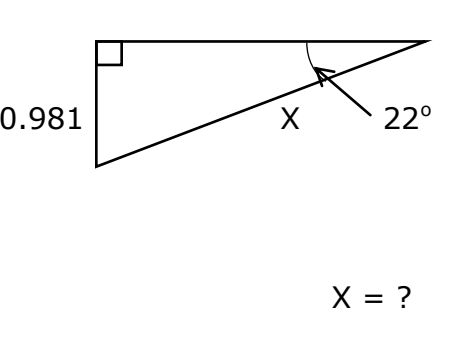
44. $\sqrt{6180 - 1880 + 4390} - \sqrt{4120}$ ----- 44= _____

45. $\sqrt[4]{0.286 - 91.2/431} + 1/\sqrt{32200 + 12000}$ ----- 45= _____

46. $(316)\sqrt[3]{60.5 + 63.7 - 57.9}$ ----- 46= _____

47. Calculate the distance between the points (17,-7) and (-11, 22) on a coordinate plane. ----- 47= _____

48. Calculate the number of terms in the series $e^0 + e^1 + e^2 + e^3 + \dots e^n$ must be added for the sum to be over one million. ----- 48= _____ INT.

<p style="text-align: center;">RIGHT TRIANGLE</p>  <p style="text-align: center;">Perimeter = ?</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. $\left[\frac{234 - 138 + \sqrt{9.05 \times 10^5 / 110}}{-876 + 1330} \right]^5$ ----- 51= _____

52. $\sqrt{\frac{1.21 \times 10^7}{(0.546)(1.22 \times 10^5)}} + \frac{(14.5 - 3.47)}{(0.216 + 0.596)}$ ----- 52= _____

53. $\frac{\sqrt{9.2 + \pi + 3.3}}{(0.427 - 0.431 + 0.484)^3}$ ----- 53= _____

54. $0.689 + \sqrt{(1900)/(1360)} - (0.794 + 0.337)^2$ ----- 54= _____

55. $(0.498)^2 \sqrt{(0.39)/(2.92)} - (0.0817 + 0.0645)$ ----- 55= _____

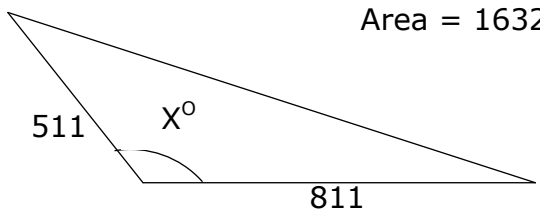
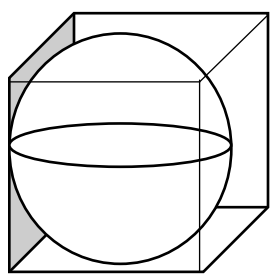
56. $\sqrt{\frac{1/(704 - 351)}{(12.2)(45.4 + 155)^4}}$ ----- 56= _____

57. $\sqrt{\frac{1/(369 - 214)}{(220)(400 + 112)^6}}$ ----- 57= _____

58. $(\text{deg}) \sin(2400^\circ) + (128/126)$ ----- 58= _____

59. Cindy needs 50 mL of 10% alcohol solution. She has a 7% solution and a 20% solution. Calculate how much of the 20% solution she will need to mix with the 7% solution to get what she needs. ----- 59= _____ mL

60. A sphere has a diameter of 2115 cm. Calculate the ratio of the volume of the sphere to its surface area. ----- 60= _____

OBTUSE SCALENE TRIANGLE	CUBE AND SPHERE
<p>Area = 163284</p>  <p style="text-align: right;">$X^\circ = ?$</p> <p>61= _____</p>	 <p>Diameter of sphere = edge of cube = 322</p> <p>Ratio of volume of cube to sphere = ?</p> <p>62= _____</p>

63. $\frac{17!}{25!}$ ----- 63= _____

64. (deg) $\frac{\cos(10.1^\circ)}{1830}$ ----- 64= _____

65. $(3.14 \times 10^9 - 2.09 \times 10^9)^{-9} (7.21 \times 10^5)$ ----- 65= _____

66. (rad) $\tan\left[\frac{(61.3)(\pi)}{(134)(343)}\right]$ ----- 66= _____

67. (rad) $\frac{\sin(7.29)}{325/3360}$ ----- 67= _____

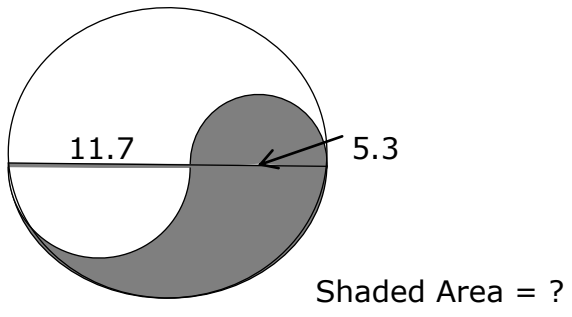
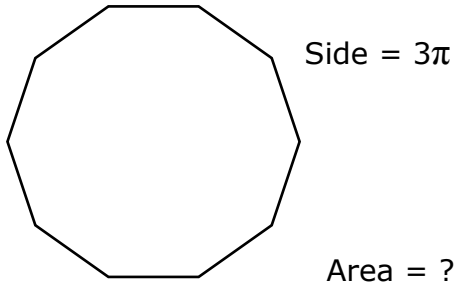
68. (deg) $\frac{\sin(17.3^\circ) - \tan(17.3^\circ)}{\sin(17.3^\circ)}$ ----- 68= _____

69. (rad) $\cos[(6.79 - 4.15)(2.57)]$ ----- 69= _____

70. $(5620 - 3810 + 5830)^{2/3}$ ----- 70= _____

71. If the odds of an event happening is 8:3, calculate the probability of the event happening. ----- 71= _____

72. A right circular cylindrical tank holds 5,000 gallons. If the height and diameter of the tank are equal, calculate the circumference of the tank. ----- 72= _____ in.

CIRCLE AND SEMICIRCLES	REGULAR DECAGON
 <p style="text-align: center;">Shaded Area = ?</p>	 <p style="text-align: center;">Area = ?</p>
73= _____	74= _____

75. $\frac{0.0328 + \sqrt{(0.0391)(0.0326)} + (0.149)(0.432)}{\sqrt{\sqrt{2.91 + 0.743}}}$ ----- 75= _____

76. $\frac{\text{Log}(1.85 \times 10^{11} + 3.16 \times 10^{11})}{1.52}$ ----- 76= _____

77. $2\text{Log}\sqrt{\frac{(67.3)(108)}{237 + 134}}$ ----- 77= _____

78. $\frac{(e^{0.815})(e^{0.925})(e^{0.808})}{\text{Ln}(3.59 + 5.44)}$ ----- 78= _____

79. $4 + 6 + 8 + \dots + 640$ ----- 79= _____

80. $(0.439) - \frac{(0.439)^2}{2} + \frac{(0.439)^3}{3} - \frac{(0.439)^4}{4}$ ----- 80= _____

2017-2018 TMSCA Middle School Calculator Test 13 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = 5180 = 5.18×10^3	14 = 521 = 5.21×10^2	27 = 0.116 = 1.16×10^{-1}	39 = 0.227 = 2.27×10^{-1}
2 = 72.0 = 7.20×10^1	15 = -5950 = -5.95×10^3	28 = -7.48×10^{-11}	40 = 2.33×10^6
3 = 1530 = 1.53×10^3	16 = 5.66×10^7	29 = 6190 = 6.19×10^3	41 = 2.10 = 2.10×10^0
4 = -190 = -1.90×10^2	17 = 0.0383 = 3.83×10^{-2}	30 = -0.00955 = -9.55×10^{-3}	42 = 0.803 = 8.03×10^{-1}
5 = 56.0 = 5.60×10^1	18 = 8410 = 8.41×10^3	31 = 6.90×10^6	43 = 66500 = 6.65×10^4
6 = -82.0 = -8.20×10^1	19 = -1.20 = -1.20×10^0	32 = 18.0 = 1.80×10^1	44 = 29.0 = 2.90×10^1
7 = -0.796 = -7.96×10^{-1}	20 = 98.8 = 9.88×10^1	33 = 1.95×10^6	45 = 0.527 = 5.27×10^{-1}
8 = 0.320 = 3.20×10^{-1}	21 = 79.2 = 7.92×10^1	34 = 0.917 = 9.17×10^{-1}	46 = 1280 = 1.28×10^3
9 = 1.52×10^6	22 = 3.17 = 3.17×10^0		
10 = 5.18×10^9	23 = -4.19×10^8		
11 = 452 INT.	24 = \$5.61	35 = 60.0 = 6.00×10^1	47 = 40.3 = 4.03×10^1
12 = 267 INT.	25 = 22.0 = 2.20×10^1	36 = 42.5 = 4.25×10^1	48 = 15 INT.
13 = 167 = 1.67×10^2	26 = 8.91 = 8.91×10^0	37 = 1.64×10^{17}	49 = 6990 = 6.99×10^3
		38 = 195 = 1.95×10^2	50 = 2.62 = 2.62×10^0

2017-2018 TMSCA Middle School Calculator Test 13 Answer Key

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$$51 = 0.0118$$
$$= 1.18 \times 10^{-2}$$

$$52 = 27.1$$
$$= 2.71 \times 10^1$$

$$53 = 35.8$$
$$= 3.58 \times 10^1$$

$$54 = 0.592$$
$$= 5.92 \times 10^{-1}$$

$$55 = -0.0556$$
$$= -5.56 \times 10^{-2}$$

$$56 = 3.79 \times 10^{-7}$$

$$57 = 4.03 \times 10^{-11}$$

$$58 = 0.150$$
$$= 1.50 \times 10^{-1}$$

$$59 = 11.5$$
$$= 1.15 \times 10^1$$

$$60 = 353$$
$$= 3.53 \times 10^2$$

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$$61 = 128$$
$$= 1.28 \times 10^2$$

$$62 = 1.91$$
$$= 1.91 \times 10^0$$

$$63 = 2.29 \times 10^{-11}$$

$$64 = 0.000538$$
$$= 5.38 \times 10^{-4}$$

$$65 = 4.65 \times 10^{-76}$$

$$66 = 0.00419$$
$$= 4.19 \times 10^{-3}$$

$$67 = 8.74$$
$$= 8.74 \times 10^0$$

$$68 = -0.0474$$
$$= -4.74 \times 10^{-2}$$

$$69 = 0.877$$
$$= 8.77 \times 10^{-1}$$

$$70 = 388$$
$$= 3.88 \times 10^2$$

$$71 = 0.727$$
$$= 7.27 \times 10^{-1}$$

$$72 = 357$$
$$= 3.57 \times 10^2$$

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$$73 = 70.8$$
$$= 7.08 \times 10^1$$

$$74 = 683$$
$$= 6.83 \times 10^2$$

$$75 = 0.0961$$
$$= 9.61 \times 10^{-2}$$

$$76 = 7.70$$
$$= 7.70 \times 10^0$$

$$77 = 1.29$$
$$= 1.29 \times 10^0$$

$$78 = 5.81$$
$$= 5.81 \times 10^0$$

$$79 = 103000$$
$$= 1.03 \times 10^5$$

$$80 = 0.362$$
$$= 3.62 \times 10^{-1}$$

MSCA 17-18 MS CA Test #13 Solutions to Word and Geometry Problems

11. $400 + 22 + 30$

12. $75(5) - 12(9)$

13. $\sqrt[3]{\pi(e^5)(10^4)}$

24. $30 - 22.85(1.0675)$

25. Montel = x
 Adam = $1.07x$
 Mark = $1.14(1.07x) = 1.22x$ so Marks weight is 22.0% more than Montel's.

26. $5x + 6x = 98$; x is the shortest side, so $x = \frac{98}{11}$

35. The sum of the interior angles of a septagon is $180(7-2) = 900$.
 $3x+5x+4x+2x+4x+5x+7x= 30x$
 $900 = 30x$; $x = 30$.
 $2x$ is the smallest angle so $2(30)$

36.

	Rate	Time	Dist
North	55	6	$6(55)$
South	x	4	$4x$

$4x + 6(55) = 500$. Solve for x .

37. $A = \frac{d^2}{2} = \frac{(5.72 \times 10^8)^2}{2}$

38. $27(9) - \frac{(\frac{11}{2})^2 \pi}{2}$

47. $\sqrt{(22 - (-7))^2 + (-11 - 17)^2}$

48. Probably the easiest way to do this is to continue adding until the sum is over 1,000,000. The pattern continues to e^{14} so it takes 15 terms.

49. $\sqrt{2117^2 + 1978^2} + 2117 + 1978$

50. $\frac{\sin 22}{1} = \frac{.981}{x}$
 $x = \frac{.981}{\sin 22}$

59.

mL	%	alcohol
$50-x$.07	$.07(50-x)$
x	.20	$.2x$
50	.1	5

$.07(50-x) + .2x = 5$. Solve for x .

60. $\frac{\frac{4}{3}\pi r^3}{4\pi r^2} = \frac{1}{3}r = \frac{1}{3}\left(\frac{2115}{2}\right)$

61. This angle is obtuse. Use $A = \frac{1}{2}ab\sin C$
 $163284 = \frac{1}{2}(511)(811)(\sin x)$
 $x = a\sin\left[\frac{2(163284)}{(511)(811)}\right]$

This gives an angle of 52 degrees. Find the supplement since the angle is obtuse.

62. $\frac{e^3}{\frac{4}{3}\pi r^3} = \frac{(322)^3}{\frac{4}{3}\pi\left(\frac{322}{2}\right)^3}$

71. $\frac{8}{11}$

72. $\pi r^2 h = 5000$ gallons
 $231 \text{ in}^3 = 1$ gallon.
 $x = \text{height and diameter}$
 $\pi\left(\frac{x}{2}\right)^2 x = 5000(231)$
 $\pi \frac{x^3}{4} = 5000(231)$
 $d = x = \sqrt[3]{\frac{(5000)(231)(4)}{\pi}}$
 $C = \pi d = \pi\left(\sqrt[3]{\frac{(5000)(231)(4)}{\pi}}\right)$

73. Find area of half of large circle. Subtract area of white semicircle. Add shaded area of semicircle. Radius of large circle is $\frac{11.7 + 5.3}{2} = 8.5$

$\frac{\pi(8.5)^2}{2} - \frac{\pi\left(\frac{11.7}{2}\right)^2}{2} + \frac{\pi\left(\frac{5.3}{2}\right)^2}{2}$

74. Area of a regular polygon $\frac{\text{Perimeter}^2}{\tan\left(\frac{180}{n}\right)(4n)}$
 $\frac{(30\pi)^2}{\tan\left(\frac{180}{10}\right)(40)}$