

2015-2016 TMSCA Middle School Calculator Test #11

1. $-1050 + 1480$ ----- 1= _____

2. $9 + 17 + 64$ ----- 2= _____

3. $-143 + 372 + 186$ ----- 3= _____

4. $10 - 18 + 15 - \pi$ ----- 4= _____

5. $-232 - 382 - 375 - 232$ ----- 5= _____

6. $-56.2 - 40.8 - 112 + 65 + 110$ ----- 6= _____

7. $5.58 - 4.4 + 5.2 - 2.7 - 2.75$ ----- 7= _____

8. $(0.709 - 0.512) + (0.792 - \pi - 2.1)$ ----- 8= _____

9. $250 \times 173 \times 692$ ----- 9= _____

10. $239 \times 305 \times 380 \times 201$ ----- 10= _____

11. Evan gave away half his collector cards to Doug. Doug in turn gave a third of those cards to Carl. Carl in turn gave a fourth of those cards to Brent. If Brent got twenty-one cards, calculate how many cards Evan had to begin with. ----- 11= _____ INT.

12. The area of a square is 27.81 square feet. Calculate the perimeter of the square in feet. ----- 12= _____ ft.

13. The ratio of the sides of a heptagon is 3:2:3:2:3:2:5. If the longest side is 27.11 cm, calculate the perimeter of the heptagon in cm. ----- 13= _____ cm

14. $(-73/103)[21 - 33]$ -----14= _____

15. $-73 - [118/98 + \pi]$ -----15= _____

16. $\{(669)(403 - 425)(412)\} - 5.97 \times 10^6$ -----16= _____

17. $\{86/183\} \left[\frac{136}{225 + 221} \right]$ -----17= _____

18. $\frac{[0.00498/(0.00505)]/273}{(28.7 \times 16.7)(260)}$ -----18= _____

19. $\left[\frac{(3.41 + 21.5)}{312/606} \right] \left[\frac{0.239}{0.077} \right]$ -----19= _____

20. $\frac{(\pi)(8/11)(5/4)}{80}$ -----20= _____

21. $\frac{511}{(455 - 173)} - \frac{(339 - 249)}{227}$ -----21= _____

22. $\left[\frac{1200 + 2180}{2500 - 1520} \right] \left[\frac{2750}{305} \right]$ -----22= _____

23. $\frac{(\pi + 2.93 - 0.976)}{\{(3.99 - 7.26)/(1.16)\}}$ -----23= _____

24. Calculate the median of the first ten composite numbers greater than ten. -----25= _____ INT.

25. The product of a number and seven increased by twelve has the same value as five times the opposite of the number. Calculate the value of the number. -----26= _____

26. A certain rectangle has a width of 8.25 cm and a length of 12.18 cm. Calculate the width of another rectangle of equal area with a length of 17.12 cm. -----27= _____ cm

27. $(0.0311)[(0.0604/0.0237)(17.1 + 16.5)]$ -----27= _____

28. $\frac{(1.94 + 1.95)(63.6 + 34.9)}{(1.37 \times 10^{11})}$ -----28= _____

29. $\frac{(3.14 - \pi)(6.21 + 11.7)}{(8.84 \times 10^{10})}$ -----29= _____

30. $[549] \left[\frac{1/1.2}{1/1.12} \right]$ -----30= _____

31. $\frac{1}{0.0823} + \frac{1}{(\pi)(0.058 - 0.0242)}$ -----31= _____

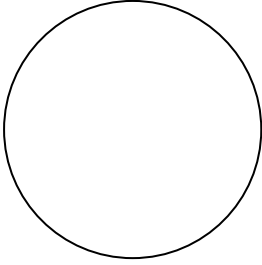
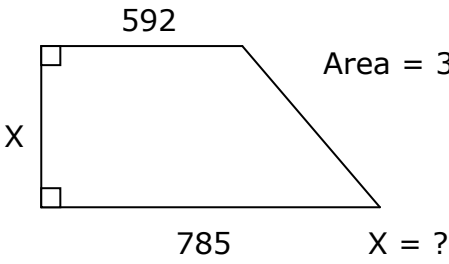
32. $(0.0461) \left[\frac{8.21}{(4.40 \times 10^{10})} \right]$ -----32= _____

33. $\left[\frac{1/807}{1/275} \right] [1.57 \times 10^6]$ -----33= _____

34. $\left[\frac{1/134}{1/634} \right] + [0.228]$ -----34= _____

35. Adam takes 3.175 hours to complete the task. Randy takes longer to do the same task, but together they can complete the task in two hours. Calculate how long it would take Randy to do the task alone. ---35= _____ hrs.

36. A line passes through the points (17,-2) and (5,5) on a coordinate plane. Calculate the slope of the line that is perpendicular to that line. -36= _____

<p style="text-align: center;">CIRCLE</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: left;"> <p>Circumference = 7.21×10^{-8}</p> <p>Radius = ?</p> </div> </div> <p style="margin-top: 20px;">37= _____</p>	<p style="text-align: center;">TRAPEZOID</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: left;"> <p>Area = 379363.5</p> <p>X = ?</p> </div> </div> <p style="margin-top: 20px;">38= _____</p>
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39. $\sqrt[3]{\frac{19.3 + 8.42}{1.62 - 0.278}}$ -----39= _____

40. $\left[\frac{32400 + (1/(3.29 \times 10^{-5}))}{(30500/19200) - 0.509}\right]^2$ -----40= _____

41. $(0.0552 + 0.113)^2(0.0577 + 0.1)^2$ -----41= _____

42. $\sqrt{1840} + \sqrt{417 + 333} - (\pi)\sqrt{2290}$ -----42= _____

43. $(1/\pi)\sqrt{\frac{1.58 + 1.01}{0.00949 - 0.00367}}$ -----43= _____

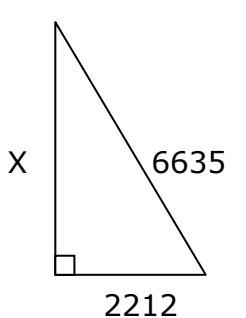
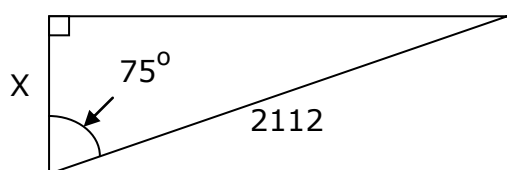
44. $(1/(0.00439))(98800 - 35000)^3$ -----44= _____

45. $[\sqrt{(16000/5450)(2.72)}]^5$ -----45= _____

46. $\frac{(14.2 + 15.6)^{1/3}}{(28.8 - 7.86)^{1/3}}$ -----46= _____

47. The sum of two integers is -747. The difference of the two integers is 897. Calculate the value of the smallest of the two integers. -----47= _____ INT.

48. Calculate the sum of the coordinates of the y-intercept of the line $-2y + 7 = 8x$. -----48= _____

RIGHT TRIANGLE	RIGHT TRIANGLE
 <p style="text-align: right; margin-right: 50px;">$X = ?$</p>	 <p style="text-align: right; margin-right: 50px;">$X = ?$</p>
49= _____	50= _____

51. $\left[\frac{398 - 369 + \sqrt{9440/38.1}}{-1950 + 2510} \right]^4$ -----51= _____

52. $\frac{\sqrt{6.78 + \pi + 16.4}}{(0.159 - 0.177 + 0.0514)^4}$ -----52= _____

53. $\left[\frac{1830 + 338 + \sqrt{3.42 \times 10^6 + 4.02 \times 10^6}}{6560/17100} \right]^4$ -----53= _____

54. $\sqrt[3]{\frac{1/(265 - 186)}{(64.5)(307 + 198)^5}}$ -----54= _____

55. $(161)^2 \sqrt{(5.07)/(16.6)} - (8450 + 11600)$ -----55= _____

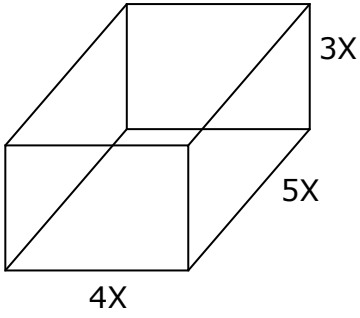
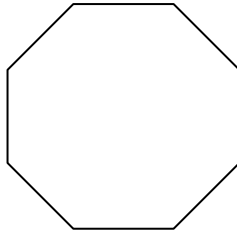
56. $(0.676)(3.05 \times 10^8)^{1/3} - [(9030)(11200)]^{1/3}$ -----56= _____

57. $\sqrt{\frac{(2880)(1320)}{(3480) + (5880)}} + 1/(0.606)^6$ -----57= _____

58. $(\text{deg}) \sin(801^\circ) + (2.22/2.42)$ -----58= _____

59. The volume of a sphere is 679.14 cubic cm. Calculate the surface area of the sphere in square cm. -----59= _____ cm²

60. Marla flips a fair coin twenty times and it lands on heads eighteen out of those twenty times. Calculate the odds that the next flip it will land on tails. -----60= _____

RECTANGULAR PRISM	REGULAR OCTAGON
 <p style="text-align: right;">Surface Area = 0.0029</p> <p style="text-align: right;">X = ?</p>	 <p style="text-align: right;">Area = 2002002</p> <p style="text-align: right;">Perimeter = ?</p>
61= _____	62= _____

63. $\frac{13! + 10!}{8!}$ -----63= _____

64. $(1.50 \times 10^5 - 32600)^6 (11900)$ -----64= _____

65. (deg) $(250 - 441)\cos(363^\circ)$ -----65= _____

66. (rad) $\sin\left[\frac{(203)(\pi)}{(51.2)(4.55)}\right]$ -----66= _____

67. (deg) $[238]\sin(5.95^\circ - 6.92^\circ)$ -----67= _____

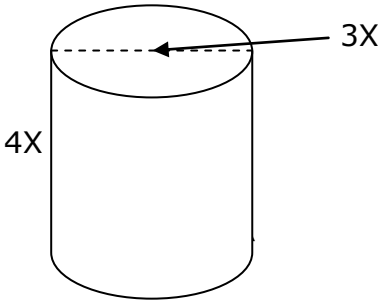
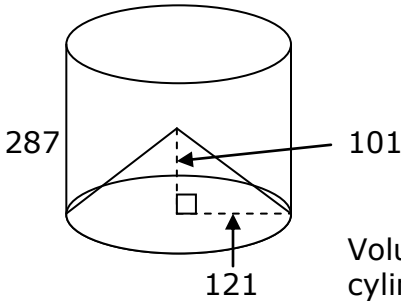
68. (deg) $\frac{\sin(6.04^\circ)}{\tan(6.04^\circ)}[214]$ -----68= _____

69. (deg) $\frac{\cos(59.7^\circ)}{23 + 20.8}$ -----69= _____

70. $(455 + 87717 + 27401)^{11/16}$ -----70= _____

71. Calculate the product of the 6th triangular number and the 3rd hexagonal number. -----71= _____ INT.

72. A boat travels for 5 hours with a current of 8 mph. and then returns the same distance against the current in 7 hours. Calculate how far the boat travels round trip. -----72= _____ mi.

<p style="text-align: center;">RIGHT CIRCULAR CYLINDER</p>  <p style="text-align: right;">Total Surface Area = 56789</p> <p style="text-align: right;">X = ?</p> <p>73= _____</p>	<p style="text-align: center;">RIGHT CIRCULAR CYLINDER AND CONE</p>  <p style="text-align: right;">Volume between cylinder and cone = ?</p> <p>74= _____</p>
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75. $\ln \left[\frac{269 + 334 + 212}{105 + 317 - 139} \right]$ -----75= _____

76. $\frac{(1.85)^{0.293}(0.742)^{0.45}}{(35.4 - 9.75)^{-10}}$ -----76= _____

77. $\text{Log} \sqrt{\frac{51.2 - 31.9}{(4.55)(9.36)}}$ -----77= _____

78. $\frac{(e^{0.563})(e^{0.654})(e^{0.61})}{\ln(896 + 2020)}$ -----78= _____

79. $1 + 2 + 3 + \dots + 891$ -----79= _____

80. $1 + 0.899 + (0.899)^2 + \frac{(0.899)^4}{8} - \frac{(0.899)^5}{15}$ -----80= _____

2015-2016 TMSCA Middle School Calculator Test #11 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = 430 = 4.30×10^2	14 = 8.50 = 8.50×10^0	27 = 2.66 = 2.66×10^0	39 = 2.74 = 2.74×10^0
2 = 90.0 = 9.00×10^1	15 = -77.3 = -7.73×10^1	28 = 2.80×10^{-9}	40 = 3.38×10^9
3 = 415 = 4.15×10^2	16 = -1.20×10^7	29 = -3.23×10^{-13}	41 = 0.000704 = 7.04×10^{-4}
4 = 3.86 = 3.86×10^0	17 = 0.143 = 1.43×10^{-1}	30 = 512 = 5.12×10^2	42 = -80.1 = -8.01×10^1
5 = -1220 = -1.22×10^3	18 = 2.90×10^{-8}	31 = 21.6 = 2.16×10^1	43 = 6.71 = 6.71×10^0
6 = -34.0 = -3.40×10^1	19 = 150 = 1.50×10^2	32 = 8.60×10^{-12}	44 = 5.92×10^{16}
7 = 0.930 = 9.30×10^{-1}	20 = 0.0357 = 3.57×10^{-2}	33 = 535000 = 5.35×10^5	45 = 180 = 1.80×10^2
8 = -4.25 = -4.25×10^0	21 = 1.42 = 1.42×10^0	34 = 4.96 = 4.96×10^0	46 = 1.12 = 1.12×10^0
9 = 2.99×10^7	22 = 31.1 = 3.11×10^1		
10 = 5.57×10^9	23 = -1.81 = -1.81×10^0	35 = 5.40 = 5.40×10^0	47 = -822 INT.
11 = 504 INT.	24 = 19 INT.	36 = 1.71 = 1.71×10^0	48 = 3.50 = 3.50×10^0
12 = 21.1 = 2.11×10^1	25 = -1.00 = -1.00×10^0	37 = 1.15×10^{-8}	49 = 6260 = 6.26×10^3
13 = 108 = 1.08×10^2	26 = 5.87 = 5.87×10^0	38 = 551 = 5.51×10^2	50 = 547 = 5.47×10^2

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$$51 = 4.07 \times 10^{-5}$$

$$52 = 4.12 \times 10^6$$

$$53 = 2.65 \times 10^{16}$$

$$54 = 2.44 \times 10^{-9}$$

$$55 = -5720 \\ = -5.72 \times 10^3$$

$$56 = -10.9 \\ = -1.09 \times 10^1$$

$$57 = 40.3 \\ = 4.03 \times 10^1$$

$$58 = 1.91 \\ = 1.91 \times 10^0$$

$$59 = 374 \\ = 3.74 \times 10^2$$

$$60 = 1.00 \\ = 1.00 \times 10^0$$

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$$61 = 0.00555 \\ = 5.55 \times 10^{-3}$$

$$62 = 5150 \\ = 5.15 \times 10^3$$

$$63 = 155000 \\ = 1.55 \times 10^5$$

$$64 = 3.12 \times 10^{34}$$

$$65 = -191 \\ = -1.91 \times 10^2$$

$$66 = 0.393 \\ = 3.93 \times 10^{-1}$$

$$67 = -4.03 \\ = -4.03 \times 10^0$$

$$68 = 213 \\ = 2.13 \times 10^2$$

$$69 = 0.0115 \\ = 1.15 \times 10^{-2}$$

$$70 = 3020 \\ = 3.02 \times 10^3$$

$$71 = 315 \text{ INT.}$$

$$72 = 560 \\ = 5.60 \times 10^2$$

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$$73 = 33.1 \\ = 3.31 \times 10^1$$

$$74 = 1.17 \times 10^7$$

$$75 = 1.06 \\ = 1.06 \times 10^0$$

$$76 = 1.29 \times 10^{14}$$

$$77 = -0.172 \\ = -1.72 \times 10^{-1}$$

$$78 = 0.779 \\ = 7.79 \times 10^{-1}$$

$$79 = 397000 \\ = 3.97 \times 10^5$$

$$80 = 2.75 \\ = 2.75 \times 10^0$$

TMSCA 15-16 MS CA Test #11 Solutions to Word and Geometry Problems

11. $E = x$; $D = \frac{1}{2}x$; $C = \frac{1}{3}\left(\frac{1}{2}\right)x$;

$B = \frac{1}{4}\left(\frac{1}{3}\right)\left(\frac{1}{2}\right)x = 21$. $\frac{1}{24}x = 21$

So $x = 21(24)$

12. Side of square is $\sqrt{27.81}$

Perimeter is $4\sqrt{27.81}$

13. The sides are a multiple of 2:3:2:3:2:3:5. If the longest side is 27.11, the multiple is $\frac{27.11}{5}$. The

perimeter is $(2+3+2+3+2+3+5)\frac{27.11}{5}$

Or $(20)\frac{27.11}{5}$

24. The median of 10 numbers will be the average of the 5th and 6th numbers: First 6 composite numbers greater than 10 are: 12,14,15,16,18,20. Average of 18 & 20 = 19.

25. $7n + 12 = 5(-n)$

$12 = -12n$, so $n = -1.00$

26. $8.25(12.18) = 17.12x$

$x = \frac{8.25(12.18)}{17.12}$

35. Shortcut for two workers only

Time working together = $\frac{ab}{a+b}$

where a and b are the times for each individual working alone.

$\frac{3.175x}{3.175+x} = 2$

so $3.175x = 2(3.175 + x)$

$3.175x = 6.35 + 2x$

$1.175x = 6.35$ so $x = \frac{6.35}{1.175}$

36. slope of line = $\frac{5-(-2)}{5-17} = \frac{7}{-12}$

Perpendicular slope is $\frac{12}{7}$

37. $7.21 \times 10^{-8} = 2\pi r$

$r = \frac{7.21 \times 10^{-8}}{2\pi}$

38. $A = \frac{1}{2}(b_1 + b_2)h$

$379363.5 = \frac{1}{2}(592 + 785)h$

$h = \frac{2(379363.5)}{(592 + 785)}$

47. $x + y = -747$

$x - y = 897$

$2x = 150$, so $x = 75$

$y = -747 - 75 = -822$

48. For the y-intercept, $x = 0$. So -

$2y = -7$, $y = 3.50$; (0,3.50) sum of coordinates is 3.50.

49. $\sqrt{6635^2 - 2212^2}$

50. $\frac{\cos 75}{1} = \frac{x}{2112}$ so

$x = 2112(\cos 75)$

59. $V = \frac{4}{3}\pi r^3$; $SA = 4\pi r^2$

$679.14 = \frac{4}{3}\pi r^3$ so

$r = \sqrt[3]{\frac{679.14}{\pi}\left(\frac{3}{4}\right)}$

$4\pi\left(\sqrt[3]{\frac{679.14}{\pi}\left(\frac{3}{4}\right)}\right)^2$

60. The next flip is not dependent on the previous flips. On 1 flip there is 1 chance to get heads, 1 chance to get tails. Odds: 1/1 = 1.00

61. $2(4x)(5x) + 2(5x)(3x) +$

$2(3x)(4x) = .0029$

$40x^2 + 30x^2 + 24x^2 = .0029$

$94x^2 = .0029$

$x = \sqrt{\frac{.0029}{94}}$

62. $\frac{\text{Perimeter}^2}{\left(\tan\frac{180}{n}\right)4n} = \text{Area}$, $n = 8$

$\frac{p^2}{\left(\tan\frac{180}{8}\right)(4)(8)} = 2002002$

$p = \sqrt{2002002(32)\left(\tan\left(\frac{180}{8}\right)\right)}$

71. triangular number $\frac{n(n+1)}{2}$

Hexagonal number:

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

6th triangular number $\frac{6 \times 7}{2} = 21$

3rd hexagonal number $3(6 - 1) = 15$

Product is 21(15).

72.

	Rate	Time	dist
With current	B + 8	5	5(B+8)
Against current	B - 8	7	7(B-8)

Distance each way is the same.

$5(B + 8) = 7(B - 8)$. Solve for B. B =

48. Distance one way = $5(48 + 8) =$

280 miles. Round trip = 560 miles.

73. $SA = 2\pi r^2 + 2\pi rh$; $r = 1.5x$

$56789 = 2\pi(1.5x)^2 +$

$2\pi(1.5x)4x$

$56789 = 2\pi(2.25x^2) + 2\pi(6x^2)$

$56789 = 2\pi(2.25x^2 + 6x^2)$

$x = \sqrt{\frac{56789}{(2\pi)(2.25 + 6)}}$

74. Cylinder minus cone

$\pi r^2 h - \frac{1}{3}\pi r^2 h$

$\pi(121)^2(287) - \frac{1}{3}\pi(121)^2(101)$