

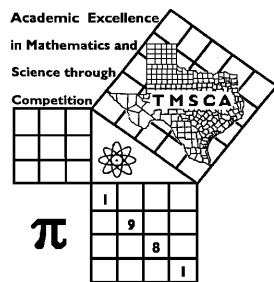
8 1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ Final Score
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

PLACE LABEL BELOW

Name: _____ School: _____

SS/ID Number: _____ City: _____

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



TMSCA MIDDLE SCHOOL CALCULATOR

TEST #1 ©

OCTOBER 23, 2021

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^{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.

2021 – 2022 TMSCA Middle School Calculator Test #1

1. $3760 - 4240$ ----- 1= _____
2. $3.09 + 1.1 + 4.4$ ----- 2= _____
3. $1420 - 553 + 766$ ----- 3= _____
4. $12 - 24 + \pi - 11$ ----- 4= _____
5. $133 + 40 + 50 + 31$ ----- 5= _____
6. $247 - 178 - 293 - 44.4 + 258$ ----- 6= _____
7. $(1.6 - 0.606) + (1.59 - 1.12 - 1.22)$ ----- 7= _____
8. $4.45 - 6.31 + 1.84 - 1.59 - \pi$ ----- 8= _____
9. $98.6 \times 60.9 \times 170$ ----- 9= _____
10. $1370 \times 3520 \times 1430 \times 51.2$ ----- 10= _____
11. Calculate the area of a triangle with a base of 3.01×10^6 in. and a height of 9.73×10^6 in. ----- 11= _____ in.²
12. Calculate the mode of Mrs. Bee's fourth period test scores. 100, 98, 85, 93, 100, 98, 77, 75, 92, 88, 90, 88, 72, 98, 78, and 72. ----- 12= _____ INT.
13. Calculate the number of feet in thirty-two miles. ----- 13= _____ ft.

14. $(279)[314 \times 308 \times 238]$ ----- 14= _____

15. $(153/159)[149 - 97]$ ----- 15= _____

16. $\left[\frac{157}{107}\right][((131/99) - 0.541)]$ ----- 16= _____

17. $\left[\frac{32}{92}\right][((70/153) + 0.123)]$ ----- 17= _____

18. $\left[\frac{(201 + 145)}{62/292}\right]\left[\frac{49.3}{0.00321}\right]$ ----- 18= _____

19. $\left[\frac{71/77}{100/30}\right]\{9.80 \times 10^{-4} + 0.0024 - 7.54 \times 10^{-4}\}$ ----- 19= _____

20. $\frac{42.1 + 108 + 109}{(2.27 \times 10^{-5})(3580)(38.6)}$ ----- 20= _____

21. $\frac{436}{(215 - 87)} - \frac{(736 - 619)}{724}$ ----- 21= _____

22. $\frac{(9.16 + 8.41 - \pi)}{\{(2.66 \times 10^{-4} - 0.00114)/(71.9)\}}$ ----- 22= _____

23. $\frac{[-(578 + 3130)(1420 - 390)]}{(2910/(1.11 \times 10^6))}$ ----- 23= _____

24. Calculate the geometric mean of e^{16} and $\sin 47^\circ$. ----- 24= _____

25. An ATV is on sale for \$5,549.95. This price is 15% off the original price. Calculate the original price of the ATV. ----- 25=\$ _____

26. Dane thinks of four consecutive integers such that six times the sum of the first and fourth is 26 less than 10 times the third. Calculate the value of the smallest integer. ----- 26= _____ INT.

27. $(\pi)[(275/292)(0.00973 + 0.00266)]$ ----- 27= _____

28. $(0.0171)[[0.928/(1.82)][8.23 \times 10^{-4}/(9.16 \times 10^{-4})]]$ ----- 28= _____

29. $[2770 - (7170 + 4600)] + [(-4.48)(2690 - 1350)]$ ----- 29= _____

30. $\frac{1}{1020} + \frac{1}{(972 - 433)}$ ----- 30= _____

31. $\frac{(0.161 + 0.104)}{(8.33 \times 10^{10})}$ ----- 31= _____

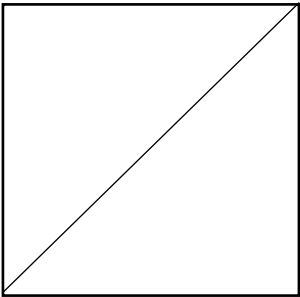
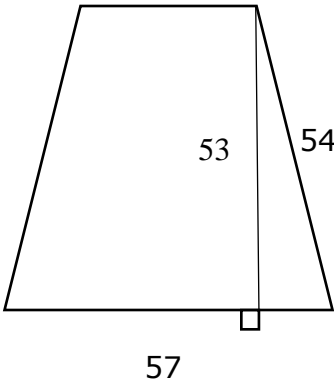
32. $[0.82] \left[\frac{1/590}{1/(442)} \right]$ ----- 32= _____

33. $\frac{1}{193} - \frac{1}{(345 + 162)}$ ----- 33= _____

34. $\left[\frac{1/438}{1/656} \right] + [0.266]$ ----- 34= _____

35. Calculate 2335^{1726} . ----- 35= _____

36. The radius of a circle and the side of a square are equal at 374 feet.
 Calculate the difference between the area of the circle and the
 area of the square. ----- 36= _____ ft.²

<p style="text-align: center;">SQUARE</p>  <p style="margin-left: 150px;">Diagonal = 67.75</p> <p style="margin-left: 150px;">Side = ?</p> <p>37= _____</p>	<p style="text-align: center;">TRAPEZOID</p>  <p style="margin-left: 150px;">Area = ?</p> <p>38= _____</p>
---	---

39. $\sqrt[4]{\frac{0.0463 + 0.193}{207 - 193}}$ ----- 39= _____

40. $(1.91 + 1.48 + 0.701)^2(172 + 190)^2$ ----- 40= _____

41. $\left[\frac{0.775}{1.38}\right](204 + 529)^4$ ----- 41= _____

42. $\sqrt{23900 - 16300 + 10600} - \sqrt{11700}$ ----- 42= _____

43. $(174)\sqrt{13200 + 15900 + 15700}$ ----- 43= _____

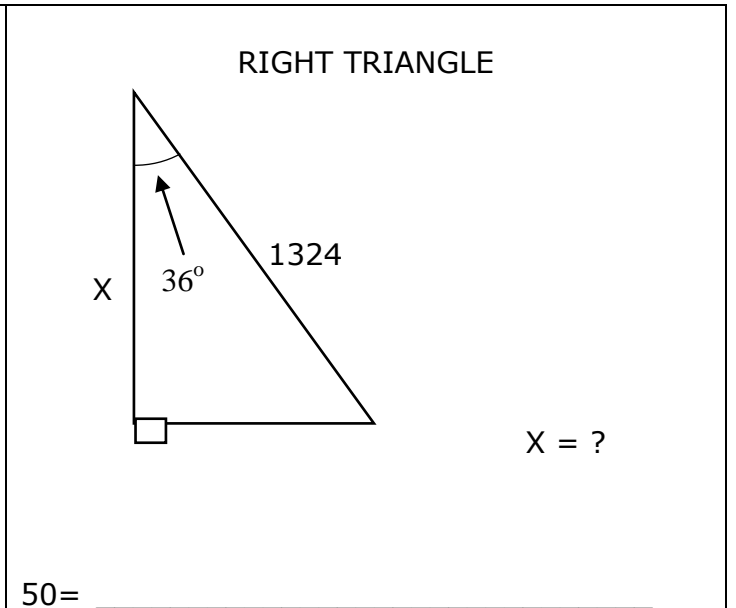
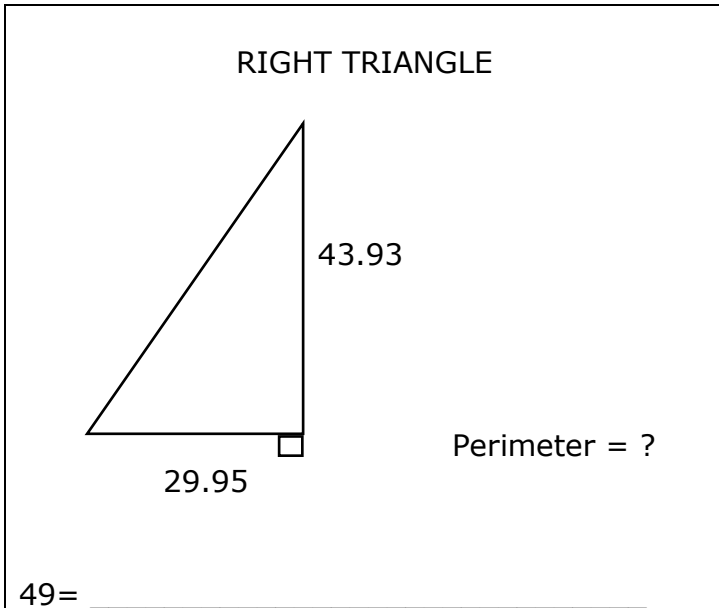
44. $\sqrt{67.7} + \sqrt{67.8 + 60.1} - (\pi)\sqrt{145}$ ----- 44= _____

45. $\left[4\sqrt{(1450/1710)(28700)}\right]^2$ ----- 45= _____

46. $\frac{1}{\sqrt{6820 + 1770 + 1730}} + \left(\frac{1}{\sqrt{53.9}}\right)^2$ ----- 46= _____

47. Sam lives in Bangor, ME. He wants to take a trip to the west coast. His friend lives in Encinitas, CA which is 3262 miles away. He wants to take 7 days to make the drive. How many hours averaging 75 mph must he drive per day. ----- 47= _____ hrs/day

48. Two angles are supplementary. One angle measures $(3x+12)^\circ$ and the other measures $(5x-8)^\circ$. Calculate the measure of the larger angle. ----- 48= _____^o



51. $\left[\frac{563 - 252 + \sqrt{1.33 \times 10^6 / 27}}{-2.75 + 3.51} \right]^{-3}$ ----- 51= _____

52. $\sqrt{\frac{4.76}{(2.68)(3470)} + \frac{(13800 - 15500)}{(23700 + 20400)}}$ ----- 52= _____

53. $\frac{\sqrt{0.19 + \pi + 1.13}}{(0.0476 - 0.0255 + 0.0356)^2}$ ----- 53= _____

54. $17000 + \sqrt{(43000)(28200)} - (9830 + 24400)$ ----- 54= _____

55. $(7.07)(1.21 \times 10^7)^{1/4} - [(128)(1310)]^{1/2}$ ----- 55= _____

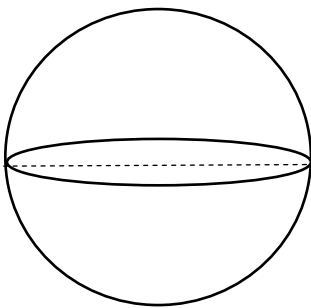
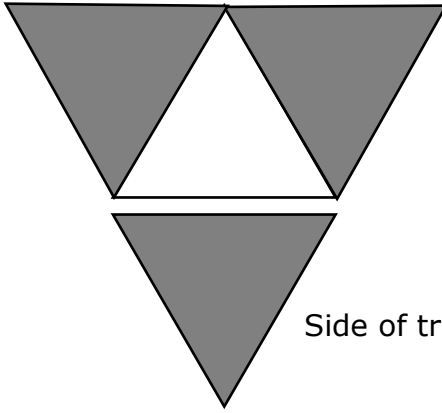
56. $\sqrt{\frac{(2.82 \times 10^5)(72900)}{(53300)(4730)}} - 3.78 + 2.44$ ----- 56= _____

57. $\sqrt{\frac{1/(3460 - 2840)}{(38.3)(2210 + 1300)^6}}$ ----- 57= _____

58. $(\text{deg}) \tan(604^\circ) + (1.08/0.36)$ ----- 58= _____

59. Calculate the distance between the point (15, -22) and the origin on the coordinate plane. ----- 59= _____

60. The sum of three consecutive integers is 421251. Calculate the value of the largest integer. ----- 60= _____ INT.

<p style="text-align: center;">SPHERE</p>  <p style="text-align: right;">Diameter = 2250</p> <p style="text-align: right;">Volume = ?</p> <p>61= _____</p>	<p style="text-align: center;">CONGRUENT EQUILATERAL TRIANGLES</p> <p style="text-align: center;">Shaded area = 28745</p>  <p style="text-align: right;">Side of triangle = ?</p> <p>62= _____</p>
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63. $\frac{16!}{12!} + 8!$ ----- 63= _____

64. (deg) $\frac{\tan(1.61^\circ)}{6550}$ ----- 64= _____

65. (deg) $(34 - 28.5)\cos(47.4^\circ)$ ----- 65= _____

66. (rad) $\cos\left[\frac{(21.6)(\pi)}{(18.3)(5.51)}\right]$ ----- 66= _____

67. (deg) $(28.4 - 12.1)\sin(215^\circ) + 8.6$ ----- 67= _____

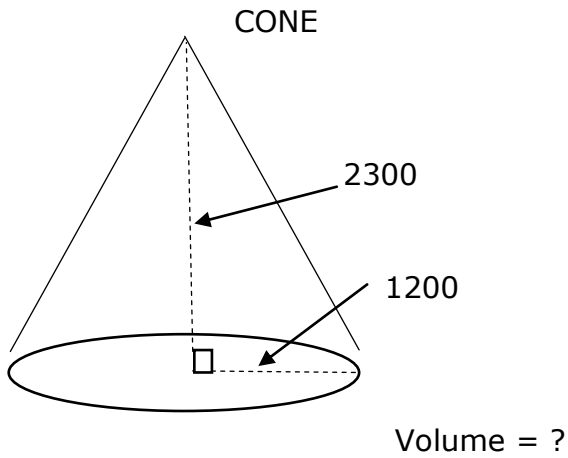
68. (deg) $\frac{\sin(1.93^\circ)}{\tan(1.93^\circ)}[312]$ ----- 68= _____

69. (rad) $(3.59)\sin(93)$ ----- 69= _____

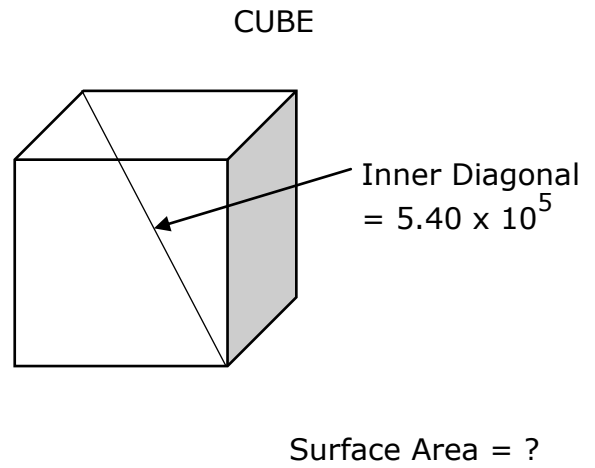
70. $(27.6 - 104)e^{\pi - 0.56}$ ----- 70= _____

71. Calculate the odds of drawing a face card, J, Q or K, from a standard deck of cards. ----- 71= _____

72. A regular hexagon has a side length of 67.12 feet. Calculate the length of the longest diagonal in feet. ----- 72= _____ ft.



73= _____



74= _____

75. $\frac{(0.799)^{0.652}(12.2)^{0.885}}{(1.34 - 0.934)^{-5}}$ ----- 75= _____

76. $\frac{\text{Log}(6.85 + 2.57)}{26800 - 22400}$ ----- 76= _____

77. $\frac{10.9 - 18.8}{\text{Log}(26300 + 31800)}$ ----- 77= _____

78. $\frac{\text{Log}[\pi + (0.791)(4.53)]}{0.411 + \text{Log}[1500 + 735]}$ ----- 78= _____

79. $4 + 6 + 8 + \dots + 300$ ----- 79= _____

80. $1 + \frac{(0.759)^4}{2} - \frac{(0.759)^6}{6} + \frac{(0.759)^8}{24} - \frac{(0.759)^{10}}{120}$ ----- 80= _____

2021 – 2022 TMSCA Middle School Calculator Test 1 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = -480 = -4.80×10^2	14 = 6.42×10^9	27 = 0.0367 = 3.67×10^{-2}	39 = 0.362 = 3.62×10^{-1}
2 = 8.59 = 8.59×10^0	15 = 50.0 = 5.00×10^1	28 = 0.00783 = 7.83×10^{-3}	40 = 2.19×10^6
3 = 1630 = 1.63×10^3	16 = 1.15 = 1.15×10^0	29 = -15000 = -1.50×10^4	41 = 1.62×10^{11}
4 = -19.9 = -1.99×10^1	17 = 0.202 = 2.02×10^{-1}	30 = 0.00284 = 2.84×10^{-3}	42 = 26.7 = 2.67×10^1
5 = 254 = 2.54×10^2	18 = 2.50×10^7	31 = 3.18×10^{-12}	43 = 36800 = 3.68×10^4
6 = -10.4 = -1.04×10^1	19 = 0.000726 = 7.26×10^{-4}	32 = 0.614 = 6.14×10^{-1}	44 = -18.3 = -1.83×10^1
7 = 0.244 = 2.44×10^{-1}	20 = 82.6 = 8.26×10^1	33 = 0.00321 = 3.21×10^{-3}	45 = 156 = 1.56×10^2
8 = -4.75 = -4.75×10^0	21 = 3.24 = 3.24×10^0	34 = 1.76 = 1.76×10^0	46 = 0.0284 = 2.84×10^{-2}
9 = 1.02×10^6	22 = -1.19×10^6		
10 = 3.53×10^{11}	23 = -1.46×10^9	35 = 4.60×10^{5813}	47 = 6.21 = 6.21×10^0
		36 = 300000 = 3.00×10^5	48 = 102 = 1.02×10^2
11 = 1.46×10^{13}	24 = 2550 = 2.55×10^3	37 = 47.9 = 4.79×10^1	49 = 127 = 1.27×10^2
12 = 98 INT.	25 = \$6,529.35		
13 = 169000 = 1.69×10^5	26 = -12 INT.	38 = 2330 = 2.33×10^3	50 = 1070 = 1.07×10^3

2021 – 2022 TMSCA Middle School Calculator Test 1 Answer Key

Page 5

$$51 = 2.90 \times 10^{-9}$$

$$52 = -0.0159 \\ = -1.59 \times 10^{-2}$$

$$53 = 634 \\ = 6.34 \times 10^2$$

$$54 = 17600 \\ = 1.76 \times 10^4$$

$$55 = 7.49 \\ = 7.49 \times 10^0$$

$$56 = 7.69 \\ = 7.69 \times 10^0$$

$$57 = 1.50 \times 10^{-13}$$

$$58 = 5.05 \\ = 5.05 \times 10^0$$

$$59 = 26.6 \\ = 2.66 \times 10^1$$

$$60 = 140,418 \text{ INT.}$$

Page 6

$$61 = 5.96 \times 10^9$$

$$62 = 149 \\ = 1.49 \times 10^2$$

$$63 = 84000 \\ = 8.40 \times 10^4$$

$$64 = 4.29 \times 10^{-6}$$

$$65 = 3.72 \\ = 3.72 \times 10^0$$

$$66 = 0.782 \\ = 7.82 \times 10^{-1}$$

$$67 = -0.749 \\ = -7.49 \times 10^{-1}$$

$$68 = 312 \\ = 3.12 \times 10^2$$

$$69 = -3.40 \\ = -3.40 \times 10^0$$

$$70 = -1010 \\ = -1.01 \times 10^3$$

$$71 = 0.300 \\ = 3.00 \times 10^{-1}$$

$$72 = 134 \\ = 1.34 \times 10^2$$

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$$73 = 3.47 \times 10^9$$

$$74 = 5.83 \times 10^{11}$$

$$75 = 0.0872 \\ = 8.72 \times 10^{-2}$$

$$76 = 0.000221 \\ = 2.21 \times 10^{-4}$$

$$77 = -1.66 \\ = -1.66 \times 10^0$$

$$78 = 0.220 \\ = 2.20 \times 10^{-1}$$

$$79 = 22600 \\ = 2.26 \times 10^4$$

$$80 = 1.14 \\ = 1.14 \times 10^0$$

TMSCA 2021-2022 MS CA Test 1 Solutions to Word and Geometry Problems

11. $\frac{(3.01 \times 10^6)(9.73 \times 10^6)}{2}$

12. Mode is the number occurring most frequently. 98

13. $32 \text{ miles} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}}$

24. $\sqrt{e^{16}(\sin 47)}$

25. 15% off; pay 85%
 $.85x = 5549.95$

$$x = \frac{5549.95}{.85}$$

26. The numbers are represented by

$$\begin{aligned} n, n+1, n+2, n+3 \\ 6(n+1+3) &= 10(n+2) - 26 \\ 6(2n+3) &= 10n+20 - 26 \\ 12n+18 &= 10n-6 \\ 2n &= -24 \\ n &= -12 \end{aligned}$$

35. 1726 2335

(Look at the digits to the left of the decimal. This gives 5813 for the exponent. Write down 10^{5813} .) Then punch

5813

(This gives 4.60 E0 which is the first part of your answer. The answer is 4.60×10^{5813}). This is done on the HP RPN calculator.

36. $\pi r^2 - \text{side}^2 = \pi(374)^2 - 374^2$

37. $\text{side} = \frac{67.75}{\sqrt{2}}$

38. $\frac{(31+57)53}{2}$

47. $75t = 3262$
 $t = \frac{3262}{75} = \text{total hours}$
 Per day = $\left(\frac{3262}{75}\right) \div 7$

48. Supplementary angles add to be 180 degrees.
 $3x + 12 + 5x - 8 = 180$
 $8x + 4 = 180$
 $x = 22$
 $3x + 12 = 66 + 12 = 78$
 Other angle = $180 - 78 = 102$

49. hypotenuse = $\sqrt{43.93^2 + 29.95^2}$
 $P = \sqrt{43.93^2 + 29.95^2} + 43.93 + 29.95$

50. $\frac{\cos 36}{1} = \frac{x}{1324}$
 $x = 1324[\cos(36)]$

59. $\sqrt{15^2 + 22^2}$

60. Middle integer = $\frac{421251}{3}$
 Largest = $\frac{421251}{3} + 1$

61. $V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \left(\frac{2250}{2}\right)^3$

62. Area of white triangle = $\frac{28745}{3} = \frac{\text{side}^2\sqrt{3}}{4}$
 Using x for side, x =

$$\sqrt{\frac{28745(4)}{3\sqrt{3}}}$$

71. 12 face cards, 40 are not face cards $\frac{12}{40}$

72. Longest diagonal of a HEXAGON = 2 of the sides. (This is only true on a hexagon.)
 67.12(2)

73. $V = \frac{1}{3}\pi r^2 h$
 $V = \frac{1}{3}\pi(1200^2)(2300)$

74. $SA = 2d^2 = 2(5.40 \times 10^5)^2$

79. The sum of even numbers 2 through n is $\left(\frac{n}{2}\right)\left(\frac{n}{2} + 1\right)$
 If beginning with 4, instead of 2, the sum is $\left(\frac{n}{2}\right)\left(\frac{n}{2} + 1\right) - 2$
 $\left(\frac{300}{2}\right)\left(\frac{300}{2} + 1\right) - 2$