

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 #11 ©

FEBRUARY 13, 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*, 1.23x10⁰*, 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.

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2020 – 2021 TMSCA Middle School Calculator Test #11

1. $2460 - 2280$ ----- 1= _____
2. $30 + 31 + 17$ ----- 2= _____
3. $31 - 164 - 163$ ----- 3= _____
4. $\pi + 25 - 5 - 26$ ----- 4= _____
5. $1760 - 568 + 267 - 305$ ----- 5= _____
6. $142 - 77.7 - 223 + 73.4 + 233$ ----- 6= _____
7. $(-3.99 - 2.35) + (4.23 - 3.71 - 4.61)$ ----- 7= _____
8. $(0.984 + 0.116 - 0.519) - (0.366 + 0.271)$ ----- 8= _____
9. $620 \times 100 \times 47$ ----- 9= _____
10. $82.5 \times 22.2 \times 3440 \times 136$ ----- 10= _____
11. Calculate the supplement of a 122.87° angle. ----- 11= _____[°]
12. The range of a set of numbers is 547.22. The greatest number in the set is -87.31. Calculate the least number in the set of numbers. ----- 12= _____
13. An Etruscan shrew has a heart that beats 1,511 in one minute. Calculate the number of heartbeats in 24 hours. ----- 13= _____ hb

14. $(366)[338 \times 282 \times 202]$ ----- 14=_____
15. $(253)[318 \times 225/198]$ ----- 15=_____
16. $(292 + 320)[179 - 86 - 254]$ ----- 16=_____
17. $\{-481/251\}\left[\frac{287}{442 + 142}\right]$ ----- 17=_____
18. $\left[\frac{216/104}{141/77}\right]\{51.6 + 17 - 53.7\}$ ----- 18=_____
19. $\frac{[0.244/(0.214)]/0.0301}{(0.00208 \times 0.00309)(2.54)}$ ----- 19=_____
20. $\frac{29}{(200 - 186)} - \frac{(47 - 52)}{111}$ ----- 20=_____
21. $\frac{(0.00121)(3.53 \times 10^{-4})}{5.07 \times 10^{-4}} (0.0335 - 0.0182)$ ----- 21=_____
22. $\frac{(\pi)(452/436)(588/586)}{(464/514)}$ ----- 22=_____
23. $\frac{(19.2 + 65.5 - 68.1)}{\{(0.522 - 0.374)/(0.00335)\}}$ ----- 23=_____
24. Miley and Milly are driving towards each other. They are 316 miles apart. One averages 58 mph and the other averages 67 mph. Calculate the number of minutes before they meet. ----- 24=_____min.
25. The ratio of paint brushes to colored pencils to paint markers in the art supply closet is 4:45:50. If there are 1,881 of these items in the closet, calculate the number of paint markers in the closet. - 25=_____INT.
26. Natalie completely finished her calculator test, attempting every problem. She missed 0 on the first page, 1 on the second page, 2 on the third page, and so on to the end of the test. Calculate her score. ----- 26=_____INT.

27. $\frac{(2.13 \times 10^{10}) + (2.89 \times 10^{10})}{(-\pi)(1.47) - 1.1}$ ----- 27=_____

28. $[1840 - (2060 + 2720)] + [(0.377)(1720 - 3710)]$ ----- 28=_____

29. $\frac{(0.0262 - 0.0719)(250 + 297)}{(8.13 \times 10^{12})}$ ----- 29=_____

30. $(\pi)[(4.38 \times 10^{11}) - (2.94 \times 10^{11})]$ ----- 30=_____

31. $(43.8) \left[\frac{2.85 \times 10^{-4}}{(4.15 \times 10^{10})} \right]$ ----- 31=_____

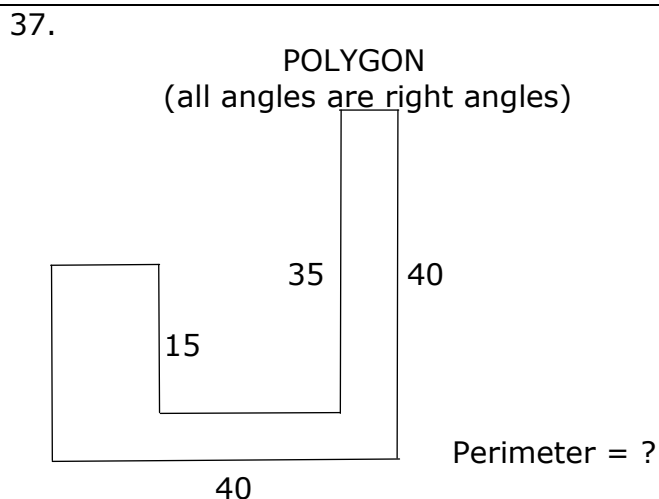
32. $\frac{(9.99 + 9.32)}{(3.04 \times 10^{11})}$ ----- 32=_____

33. $1/(9.40 \times 10^{-4} - 0.00127) - 1/(-1.30 \times 10^{-4})$ ----- 33=_____

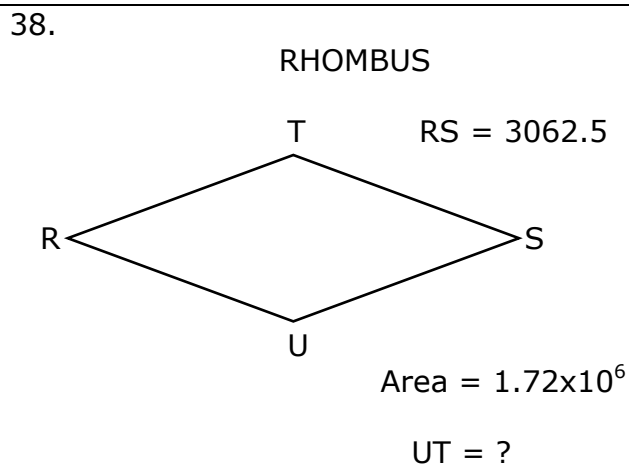
34. $\frac{1}{159} - \frac{1}{(157 + 136)}$ ----- 34=_____

35. An 8.5x11 sheet of paper is reduced to a 3x5 notecard. Calculate the percent change in the perimeter of the pieces of paper. ----- 35=_____%

36. A sphere has a diameter of 22.8 inches. Calculate the number of gallons of liquid it will hold. ----- 36=_____gal.

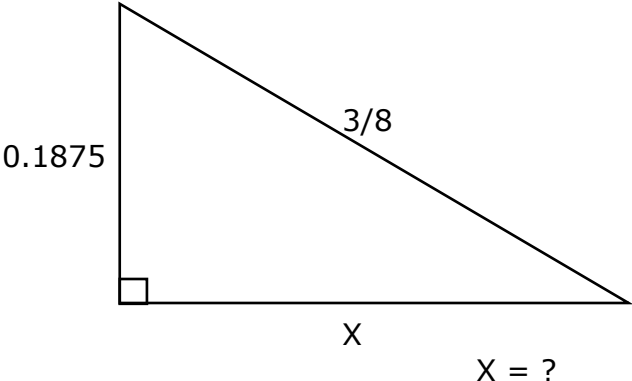
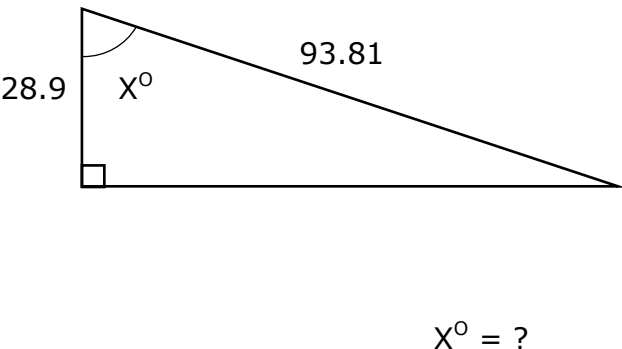


37=_____



38=_____

39. $(0.444 + 0.602 + 0.513)^2(59.1 + 33.1)^2$ ----- 39=_____
40. $\left[\frac{27400 + (1/(5.84 \times 10^{-5}))}{(19100/25200) - 0.194} \right]^2$ ----- 40=_____
41. $\left[\frac{4500}{71.4} \right](428 + 658)^2$ ----- 41=_____
42. $\sqrt{1920 - 706 + 2100} - \sqrt{2230}$ ----- 42=_____
43. $(1/\pi)\sqrt{\frac{0.0425 + 0.0181}{5.29 - 5.12}}$ ----- 43=_____
44. $\sqrt{(3.26/18.4) + 0.149 - 0.0598}$ ----- 44=_____
45. $\frac{(28.3 + 24.4)^{1/2}}{(10.6 - 2.86)^{1/5}}$ ----- 45=_____
46. $(678)^4\sqrt{8940 + 12700 - 8570}$ ----- 46=_____
47. Calculate $-(-2376)^{6339}$ ----- 47=_____
48. Scorpion venom is considered the most expensive liquid in the world at \$39,000,000 per gallon. Calculate the cost per cubic centimeter (cc). ----- 48=\$_____

<p>49. RIGHT TRIANGLE</p>  <p style="text-align: center;">X = ?</p> <p>49=_____</p>	<p>50. RIGHT TRIANGLE</p>  <p style="text-align: center;">X° = ?</p> <p>50=_____</p>
---	--

$$51. \frac{\sqrt{14.9 + \pi + 30.9}}{(0.785 - 0.856 + 0.864)^4} \text{ ----- } 51 = \underline{\hspace{2cm}}$$

$$52. \sqrt{\frac{1.45 \times 10^{15}}{(682)(408)}} + \frac{(8340 - 29100)}{(0.068 + 0.112)} \text{ ----- } 52 = \underline{\hspace{2cm}}$$

$$53. \left[\frac{97.6 - 19.7 + \sqrt{12700/4.83}}{-222 + 309} \right]^{-5} \text{ ----- } 53 = \underline{\hspace{2cm}}$$

$$54. \sqrt{\frac{(24300)(8700)}{(1.40 \times 10^5)(11600)}} - 0.341 + 0.0677 \text{ ----- } 54 = \underline{\hspace{2cm}}$$

$$55. 0.0973 + \sqrt{(74.9)/(1640)} - (0.159 + 0.226)^2 \text{ ----- } 55 = \underline{\hspace{2cm}}$$

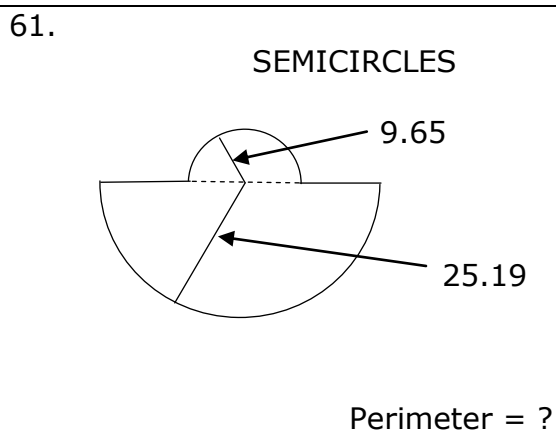
$$56. (15.3)(1.35 \times 10^8)^{1/2} - [(1.39 \times 10^{10})(1.36 \times 10^{11})]^{1/4} \text{ ---- } 56 = \underline{\hspace{2cm}}$$

$$57. (\text{rad}) \sin(135) + (670/98) \text{ ----- } 57 = \underline{\hspace{2cm}}$$

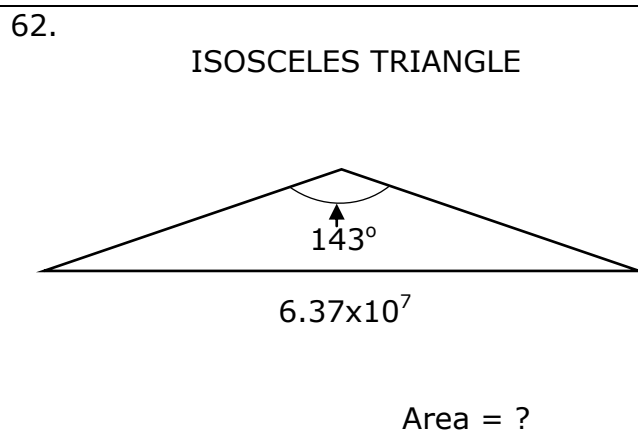
$$58. \sqrt{\frac{1/(14.4 - 4.78)}{(6710)(66.5 + 46.2)^{-6}}} \text{ ----- } 58 = \underline{\hspace{2cm}}$$

59. The stopping distance of a car is directly proportional to the square of its' speed. If the stopping distance of a certain car is 252 feet at 70 mph, calculate the stopping distance at 75 mph. ----- 59=_____ft.

60. The complete Math/Science team with coaches and parents went to the amusement park to celebrate their win. They purchased a total of 59 tickets for \$1,187. Adult tickets cost \$25 and student tickets cost \$16. Calculate the number of adult tickets purchased. 60=_____INT.



61= _____



62= _____

63. $\frac{26!}{25!} + 4!$ ----- 63= _____

64. (deg) $(46.1 - 98)\cos(124^\circ)$ ----- 64= _____

65. $(1.75 \times 10^9 - 7.13 \times 10^8)^9 (1.71 \times 10^8)$ ----- 65= _____

66. (deg) $(55 - 193)\tan(303^\circ) + 119$ ----- 66= _____

67. (rad) $\tan\left[\frac{(70.4)(\pi)}{(79.8)(69.2)}\right]$ ----- 67= _____

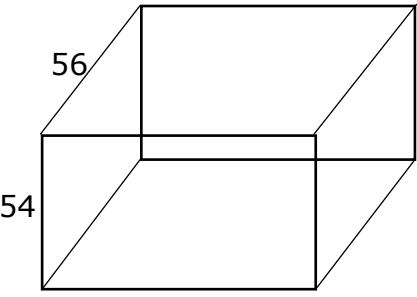
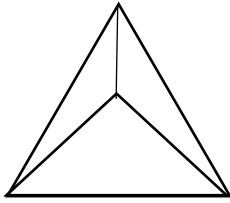
68. (deg) $\frac{\sin(7.72^\circ)}{1910 + 1320}$ ----- 68= _____

69. (deg) $\frac{\sin(22.6^\circ)}{\tan(22.6^\circ)} [55.2]$ ----- 69= _____

70. $(320 - 319)^{0.0601} - 0.0221$ ----- 70= _____

71. Calculate the probability of rolling a sum of more than 5 on a pair of dice. ----- 71= _____

72. Rondo thought of three consecutive odd integers such that 4 times the first is 14 less than twice the sum of 2 and the third. Calculate the largest integer. ----- 72= _____ INT.

<p>73. RECTANGULAR PRISM</p>  <p>Inner Diagonal = ?</p> <p>73= _____</p>	<p>74. REDULAR TETRAHEDRON</p>  <p>Edge = 15.22</p> <p>Volume = ?</p> <p>74= _____</p>
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75. $\frac{(3.7)^{0.254}(12)^{0.185}}{(0.982 - 0.427)^{-11}}$ ----- 75= _____

76. $\ln\left[\frac{234 + 443 + 180}{82.4 + 147 - 142}\right]$ ----- 76= _____

77. $(21800)10^{(0.968)(6.47)}$ ----- 77= _____

78. $(27.9)^\pi(32.6)^4(0.678 - 0.461)^4$ ----- 78= _____

79. $4 + 6 + 8 + \dots + 876$ ----- 79= _____

80. $(0.92) - \frac{(0.92)^2}{2} + \frac{(0.92)^3}{3} - \frac{(0.92)^4}{4}$ ----- 80= _____

2020 – 2021 TMSCA Middle School Calculator Test #11 Answer Key

Page 1	Page 2	Page 3	Page 4	.
1 = 180 = 1.80×10^2	14 = 7.05×10^9	27 = -8.78×10^9	39 = 20700 = 2.07×10^4	
2 = 78.0 = 7.80×10^1	15 = 91400 = 9.14×10^4	28 = -3690 = -3.69×10^3	40 = 6.23×10^9	
3 = -296 = -2.96×10^2	16 = -98500 = -9.85×10^4	29 = -3.07×10^{-12}	41 = 7.43×10^7	
4 = -2.86 = -2.86×10^0	17 = -0.942 = -9.42×10^{-1}	30 = 4.52×10^{11}	42 = 10.3 = 1.03×10^1	
5 = 1150 = 1.15×10^3	18 = 16.9 = 1.69×10^1	31 = 3.01×10^{-13}	43 = 0.190 = 1.90×10^{-1}	
6 = 148 = 1.48×10^2	19 = 2.32×10^6	32 = 6.35×10^{-11}	44 = 0.516 = 5.16×10^{-1}	
7 = -10.4 = -1.04×10^1	20 = 2.12 = 2.12×10^0	33 = 4660 = 4.66×10^3	45 = 4.82 = 4.82×10^0	
8 = -0.0560 = -5.60×10^{-2}	21 = 1.29×10^{-5}	34 = 0.00288 = 2.88×10^{-3}	46 = 7250 = 7.25×10^3	
9 = 2.91×10^6	22 = 3.62 = 3.62×10^0			
10 = 8.57×10^8	23 = 0.376 = 3.76×10^{-1}	35 = -59.0 = -5.90×10^1	47 = 3.09×10^{21399}	
11 = 57.1 = 5.71×10^1	24 = 152 = 1.52×10^2	36 = 26.9 = 2.69×10^1	48 = \$10,302.71	
12 = -635 = -6.35×10^2	25 = 950 INT.	37 = 190 = 1.90×10^2	49 = 0.325 = 3.25×10^{-1}	
13 = 2.18×10^6	26 = 211 INT.	38 = 1120 = 1.12×10^3	50 = 72.1 = 7.21×10^1	

2020 – 2021 TMSCA Middle School Calculator Test #11 Answer Key

Page 5

$$51 = 17.7$$
$$= 1.77 \times 10^1$$

$$52 = -43100$$
$$= -4.31 \times 10^4$$

$$53 = 0.139$$
$$= 1.39 \times 10^{-1}$$

$$54 = 0.0875$$
$$= 8.75 \times 10^{-2}$$

$$55 = 0.163$$
$$= 1.63 \times 10^{-1}$$

$$56 = -30700$$
$$= -3.07 \times 10^4$$

$$57 = 6.93$$
$$= 6.93 \times 10^0$$

$$58 = 5630$$
$$= 5.63 \times 10^3$$

$$59 = 289$$
$$= 2.89 \times 10^2$$

$$60 = 27 \text{ INT.}$$

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$$61 = 141$$
$$= 1.41 \times 10^2$$

$$62 = 3.39 \times 10^{14}$$

$$63 = 50.0$$
$$= 5.00 \times 10^1$$

$$64 = 29.0$$
$$= 2.90 \times 10^1$$

$$65 = 2.37 \times 10^{89}$$

$$66 = 332$$
$$= 3.32 \times 10^2$$

$$67 = 0.0401$$
$$= 4.01 \times 10^{-2}$$

$$68 = 4.16 \times 10^{-5}$$

$$69 = 51.0$$
$$= 5.10 \times 10^1$$

$$70 = 1.00$$
$$= 1.00 \times 10^0$$

$$71 = 0.722$$
$$= 7.22 \times 10^{-1}$$

$$72 = 3 \text{ INT.}$$

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$$73 = 123$$
$$= 1.23 \times 10^2$$

$$74 = 416$$
$$= 4.16 \times 10^2$$

$$75 = 0.00340$$
$$= 3.40 \times 10^{-3}$$

$$76 = 2.28$$
$$= 2.28 \times 10^0$$

$$77 = 3.99 \times 10^{10}$$

$$78 = 8.71 \times 10^7$$

$$79 = 192000$$
$$= 1.92 \times 10^5$$

$$80 = 0.577$$
$$= 5.77 \times 10^{-1}$$

TMSCA 2020-2021 MS CA Test 11 Solutions to Word and Geometry Problems

11. $180 - 122.87$

12. $-87.31 - x = 547.22$
 $x = \frac{547.22 + 87.31}{-1}$

13. $1511(60)(24)$

24. $58x + 67x = 316$

$x = \frac{316}{58+67}$ Multiply by 60 to change to minutes.

25. $4x + 45x + 50x = 1881$

$$x = \frac{1881}{4 + 45 + 50}$$

Paint markers:

$$50 \left(\frac{1881}{4 + 45 + 50} \right)$$

26. Missed 21 problems.

$$400 - 9(21)$$

35. Original perimeter =

$$2(8.5 + 11) = 39$$

Reduced perimeter =

$$2(3 + 5) = 16$$

Use % change key OR

$$\frac{x}{100} = \frac{16 - 39}{(16 - 39)(100)}$$

$$x = \frac{39}{39}$$

36. $r = \frac{22.8}{2}$ $V = \frac{4}{3}\pi r^3$

Gallons = $\frac{4}{3}\pi \left(\frac{22.8}{2}\right)^3 \div 231$

37. The top and bottom are 40 each.

$$P = 40 + 40 + 40 + 35 + 15 + 20$$

38. $A = \frac{3062.5x}{2} = 1.72 \times 10^6$
 $x = \frac{(1.72 \times 10^6)(2)}{3062.5}$

47. This answer will be positive so just do 2376^{6339}

6339 ENTER 2376 log

x

SHOW

(Look at the digits to the left of the decimal. This gives 21399 for the exponent. Write down 10^{21399} .)

Then punch

21399 - 10^x

(This gives 3.09 E0 which is the first part of your answer. The answer is 3.09×10^{21399}). This is done on the HP RPN calculator.

48. Note: $1 \text{ in}^3 = 2.54^3 \text{ cm}^3$

$$\frac{39000000}{1 \text{ gal}} \cdot \frac{1 \text{ gal}}{231 \text{ in}^3} \cdot \frac{1 \text{ in}^3}{(2.54)^3}$$

This is money so look at all digits to get \$ and cents.

49. $\sqrt{\left(\frac{3}{8}\right)^2 - (.1875)^2}$

50. $\cos x = \frac{28.9}{93.81}$

$$x = \arccos\left(\frac{28.9}{93.81}\right)$$

Some calculators use \cos^{-1}

59. $\frac{252}{70^2} = \frac{x}{75^2}$ $x = \frac{252(75^2)}{70^2}$

60. $x = \# \text{ of student tickets}$

$$\begin{cases} 25A + 16x = 1187 \\ A + x = 59 \end{cases}$$

$$x = 59 - A$$

$$25A + 16(59 - A) = 1187$$

$$25A + 944 - 16A = 1187$$

$$9A = 1187 - 944$$

$$A = \frac{1187 - 944}{9}$$

61. Straight pieces each

$$25.19 - 9.65$$

Small semicircle $\pi(9.65)$

Large semicircle $\pi(25.19)$

Add 2 straight pieces to the 2 semicircles.

62. Draw a height from vertex angle to base. The triangle is cut in half with an angle of $\frac{143}{2} = 71.5$. Use half of the base to find height.

$$\tan 71.5 = \frac{\left(\frac{6.37 \times 10^7}{2}\right)}{h}$$

$$h = \frac{6.37 \times 10^7}{2} \div \tan 71.5$$

Area =

$$\frac{6.37 \times 10^7}{2} \left(\frac{6.37 \times 10^7}{2} \div \tan 71.5 \right)$$

71. $\frac{5+6+5+4+3+2+1}{36}$

72. Odd integers are

$$x, x + 2, x + 4$$

$$4x = 2(2 + x + 4) - 14$$

$$4x = 2(x + 6) - 14$$

Solve for x . $x = -1$. This is the smallest. Largest is $x + 4$.

73. $\sqrt{95.8^2 + 54^2 + 56^2}$

74. $V = \frac{\text{side}^3}{6\sqrt{2}} = \frac{15.22^3}{6\sqrt{2}} =$