

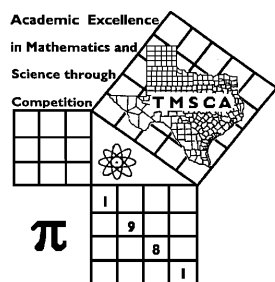
1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ <b>Final Score</b>
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

## 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 #9 ©

JANUARY 28, 2023

### GENERAL DIRECTIONS

- I. About this test:
  - A. You will be given 30 minutes to take this test. There are 80 problems on this test.
- II. **Calculators limited to the types specified by UIL. Calculators are no longer required to be cleared.**
- III. 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<sup>0\*</sup>, 1.23x10<sup>1</sup>, 1.23x10<sup>01</sup>, .0190, 1.90x10<sup>-2</sup>  
 Incorrect: 12.30, 123.0, 1.23(10)<sup>2</sup>, 1.23·10<sup>2</sup>, 1.230x10<sup>2</sup>, 1.23\*10<sup>2</sup>, 0.19, 1.9x10<sup>-2</sup>, 19.0x10<sup>-3</sup>, 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.
- IV. 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:  $\pi$  for 3.14159 . . . ; e for 2.71828.
  - D. Logarithms: Log means common (base 10); Ln means natural (base e).
- V. 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.

**2022 – 2023 TMSCA Middle School Calculator Test 9**

1.  $1710 - 1780$  ----- 1 = \_\_\_\_\_

2.  $36 + 26 - 9$  ----- 2 = \_\_\_\_\_

3.  $-315 + 83 - 476$  ----- 3 = \_\_\_\_\_

4.  $22 - 21 + 28 - 17$  ----- 4 = \_\_\_\_\_

5.  $143 + 124 - 144 - 91$  ----- 5 = \_\_\_\_\_

6.  $46.5 + 261 - 197 - 303 + 101$  ----- 6 = \_\_\_\_\_

7.  $3.51 + 5.59 + 4.48 + 3.56 + 5.75$  ----- 7 = \_\_\_\_\_

8.  $(-0.233 - 1.41) + (0.876 - 0.361 - 1.21)$  ----- 8 = \_\_\_\_\_

9.  $154 \times 296 \times 305$  ----- 9 = \_\_\_\_\_

10.  $5170 \times 380 \times 90.5 \times 74.3$  ----- 10 = \_\_\_\_\_

11. Mrs. Freeman bought 18 packs of drink mix for \$22.79, not including tax. Calculate the cost of each pack. ----- 11 = \$\_\_\_\_\_

12. The vertices of a rectangle have the coordinates (1,3), (1,6), (8,3), and (8,6). Calculate the area of the rectangle. ----- 12 = \_\_\_\_\_ units<sup>2</sup>

13. Convert  $11\pi/6$  radians to degrees. ----- 13 = \_\_\_\_\_<sup>o</sup>

14.  $(295)[306 \times 620/664]$  ----- 14= \_\_\_\_\_

15.  $(392/246)[168 - 114]$  ----- 15= \_\_\_\_\_

16.  $\{(224)(283 - 374)(277)\} - 2.27 \times 10^6$  ----- 16= \_\_\_\_\_

17.  $\left[\frac{106}{25}\right][ (78/68) - 0.639 ]$  ----- 17= \_\_\_\_\_

18.  $\frac{[0.061/(0.0102)]/0.611}{(68.1 \times 105)(2.43)}$  ----- 18= \_\_\_\_\_

19.  $\left[\frac{(0.00138 + 0.00149)}{400/234}\right] \left[\frac{0.0756}{0.0041}\right]$  ----- 19= \_\_\_\_\_

20.  $(0.149)[785/797 \times 601/164] - 0.326$  ----- 20= \_\_\_\_\_

21.  $\frac{239}{(213 - 87)} - \frac{(71 - 97)}{112}$  ----- 21= \_\_\_\_\_

22.  $\frac{(955 \times 8320)/8980}{(6670 \times 3.49) + 3990}$  ----- 22= \_\_\_\_\_

23.  $\frac{(\pi)(156/133)(159/136)}{(179/215)}$  ----- 23= \_\_\_\_\_

24. Frances has averages of 92, 97, 95, and 89 in her core classes.  
Calculate the geometric mean of her averages. ----- 24= \_\_\_\_\_

25. A square has an area of 12,265 cm<sup>2</sup>. Calculate the diagonal of the  
square in centimeters. ----- 25= \_\_\_\_\_ cm

26. A quadrilateral has two equal angles. The third angle is equal to  
the sum of the two equal angles and the fourth angle is 60° less  
than twice the sum of the first three angles. Calculate the  
measure of the largest angle in degrees. ----- 26= \_\_\_\_\_ °

27.  $\frac{(0.0756 - 0.194)(0.321 + 0.354)}{(3.41 \times 10^{11})}$  ----- 27= \_\_\_\_\_

28.  $\frac{(0.0198 + 0.0172)(111 + 109)}{(8.28 \times 10^{11})}$  ----- 28= \_\_\_\_\_

29.  $(0.00604) \left[ (0.0625/0.071)(7.04 \times 10^{-4} + 9.93 \times 10^{-4}) \right]$  --- 29= \_\_\_\_\_

30.  $\frac{1}{6580} + \frac{1}{(2970 - 729)}$  ----- 30= \_\_\_\_\_

31.  $[0.196] \left[ \frac{1/44.7}{1/64.7} \right]$  ----- 31= \_\_\_\_\_

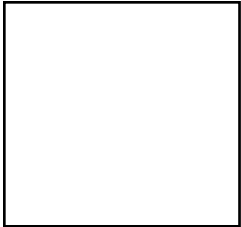
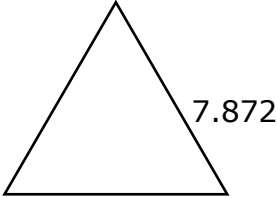
32.  $(255) \left[ \frac{0.0163}{(8.87 \times 10^9)} \right]$  ----- 32= \_\_\_\_\_

33.  $\left[ \frac{1/1220}{1/530} \right] [5.81 \times 10^6]$  ----- 33= \_\_\_\_\_

34.  $\frac{1}{3620} - \frac{1}{4960} + \frac{1}{3780}$  ----- 34= \_\_\_\_\_

35. Calculate the additive inverse of the reciprocal of the 8<sup>th</sup> root of pi to the 25<sup>th</sup> power. ----- 35= \_\_\_\_\_

36. The sum of the supplement and complement of an angle is 230°. Calculate the measure of the angle. ----- 36= \_\_\_\_\_°

<p>37. <span style="margin-left: 100px;">SQUARE</span></p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: left;"> <p>Area = <math>7.50 \times 10^{-4}</math></p> <p>Perimeter = ?</p> </div> </div> <p>37= _____</p>	<p>38. <span style="margin-left: 100px;">EQUILATER TRIANGLE</span></p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="text-align: left;"> <p>7.872</p> <p>Height = ?</p> </div> </div> <p>38= _____</p>
---	---

39.  $(0.938 + 2.4)^2(0.554 + 0.612)^2$  ----- 39= \_\_\_\_\_

40.  $\sqrt[3]{\frac{6.22 + 13.9}{55.8 - 48.4}}$  ----- 40= \_\_\_\_\_

41.  $\frac{(16200 + 2380)^3}{(0.0354 - 0.0396)^2}$  ----- 41= \_\_\_\_\_

42.  $(1/(2.83 \times 10^{-4}))(29700 - 13800)^2$  ----- 42= \_\_\_\_\_

43.  $(1/\pi)\sqrt[4]{\frac{0.0122 + 0.0172}{0.944 - 0.653}}$  ----- 43= \_\_\_\_\_

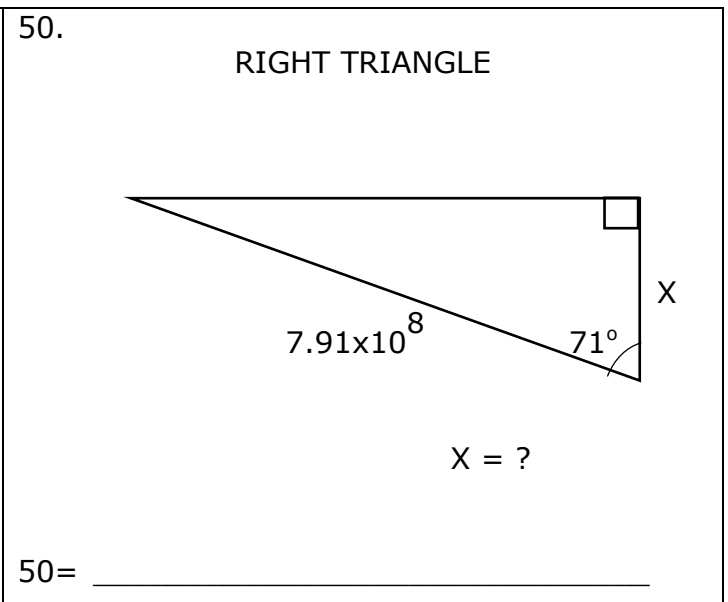
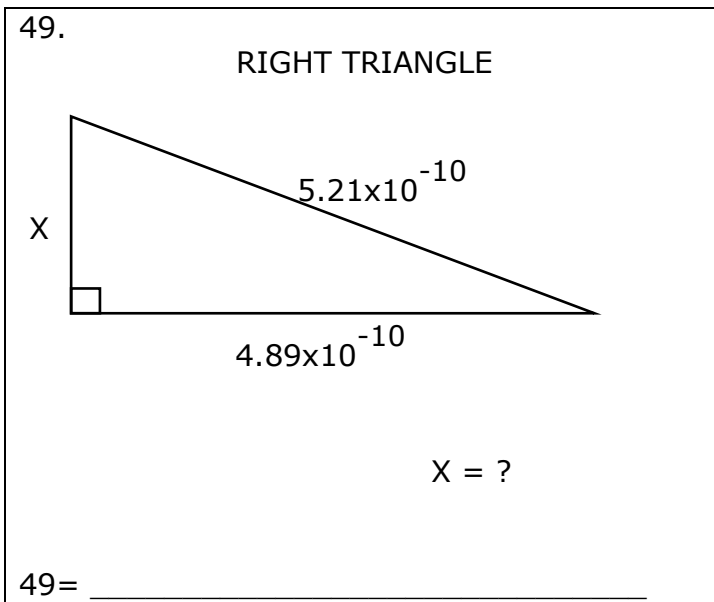
44.  $(3260)\sqrt{14200 + 17800 + 9050}$  ----- 44= \_\_\_\_\_

45.  $(8500)\sqrt[3]{2190 + 2990 - 1740}$  ----- 45= \_\_\_\_\_

46.  $[\sqrt{(16.8/37.4)(4620)}]^3$  ----- 46= \_\_\_\_\_

47. A tire with an 18-inch diameter rotates 11,722 times during a trip.  
Calculate how far the tire traveled in miles. ----- 47= \_\_\_\_\_ mi.

48. Trevor drove to his office and back. He drove there in 1.5 hours and  
returned in 2 hours. He averaged 15 mph faster there than the return  
trip. Calculate his speed on the return trip. ----- 48= \_\_\_\_\_ mph



51.  $\left[ \frac{496 - 82.3 + \sqrt{1.03 \times 10^9 / 7850}}{-5.71 + 19.7} \right]^{-5}$  ----- 51= \_\_\_\_\_

52.  $\left[ \frac{25400 + 30600 + \sqrt{2.73 \times 10^9 + 3.00 \times 10^9}}{569/227} \right]^3$  ----- 52= \_\_\_\_\_

53.  $\frac{(2940 + 3210 - 3010)^3}{\sqrt{35300 + 32200 + 17100}}$  ----- 53= \_\_\_\_\_

54.  $(1230)(7.49 \times 10^7)^{1/3} - [(2.88 \times 10^8)(5.29 \times 10^8)]^{1/3}$  ----- 54= \_\_\_\_\_

55.  $\sqrt{\frac{(4.82 \times 10^5)(72300)}{(2.86 \times 10^5)(8.36 \times 10^5)}} - 0.192 + 0.313$  ----- 55= \_\_\_\_\_

56.  $0.0446 + \sqrt{(77.8)/(3620)} - (0.131 + 0.323)^2$  ----- 56= \_\_\_\_\_

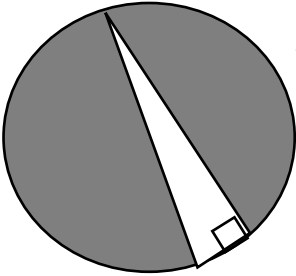
57.  $(\text{rad}) \cos(25.4) + (18.6/16.4)$  ----- 57= \_\_\_\_\_

58.  $\sqrt{\frac{(65.8)(1620)}{(313) + (1720)}} - 49.3$  ----- 58= \_\_\_\_\_

59. Calculate the area of a regular decagon with a side length of 8.221 in. and an apothem of 12.650 in. ----- 60= \_\_\_\_\_ in.<sup>2</sup>

60. Calculate the probability of rolling a sum less than six on a standard pair of dice. ----- 61= \_\_\_\_\_

61. CIRCLE AND RIGHT TRIANGLE

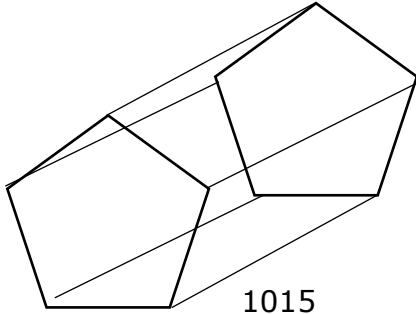


Legs of the right triangle are 4 and 13

Hypotenuse = diameter of circle.

Shaded area = ?

62. REGULAR PENTAGONAL PRISM



Volume = ?

61= \_\_\_\_\_

62= \_\_\_\_\_

63.  $\frac{18! + 23!}{25!}$  ----- 63= \_\_\_\_\_

64.  $(229 - \pi)e^{0.407}$  ----- 64= \_\_\_\_\_

65.  $(\text{deg}) (26.2 + 23.3)\cos(255^\circ)$  ----- 65= \_\_\_\_\_

66.  $(\text{rad}) \tan\left[\frac{(0.752)(\pi)}{(36.5)(17.6)}\right]$  ----- 66= \_\_\_\_\_

67.  $(\text{deg}) \cos(8.4^\circ - 8^\circ) + 0.624$  ----- 67= \_\_\_\_\_

68.  $(\text{deg}) \frac{\sin(106^\circ)}{\tan(106^\circ)}[21.3]$  ----- 68= \_\_\_\_\_

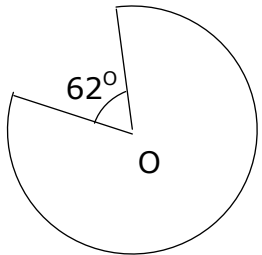
69.  $(\text{deg}) \frac{\sin(0.89^\circ) - \tan(0.89^\circ)}{\sin(0.89^\circ)}$  ----- 69= \_\_\_\_\_

70.  $\left[(242)\left(\frac{181}{(1620)(\pi)}\right)\right]^{3/2}$  ----- 70= \_\_\_\_\_

71. Calculate the interest earned on \$10,000 invested at 3% interest compounded monthly for 5 years. ----- 71=\$ \_\_\_\_\_

72. Three consecutive odd integers add up to 603. Calculate the largest integer. ----- 72= \_\_\_\_\_ INT.

73. SECTOR OF CIRCLE



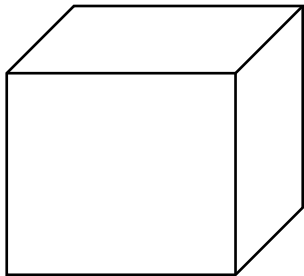
Center of Circle O

Area of Sector = 124,698

Radius = ?

73= \_\_\_\_\_

74. CUBE



Volume = 36,963

Inner Diagonal = ?

74= \_\_\_\_\_

75.  $\ln\left[\frac{315 + 99.8 + 459}{50.2 + 170 - 141}\right]$  ----- 75= \_\_\_\_\_

76.  $\frac{(21.5)^{0.23}(4.14)^{0.837}}{(4.43 - 3.43)^{-8}}$  ----- 76= \_\_\_\_\_

77.  $\log(3640 + 5950 + 1990)$  ----- 77= \_\_\_\_\_

78.  $(7.75)^\pi(321)^2(1.33 - 0.92)^5$  ----- 78= \_\_\_\_\_

79.  $1 + 3 + 5 + \dots + 565$  ----- 79= \_\_\_\_\_

80.  $1 + 0.5 + (0.5)^2 + \frac{(0.5)^4}{8} - \frac{(0.5)^5}{15}$  ----- 80= \_\_\_\_\_



**2022 – 2023 TMSCA Middle School Calculator Test 9 Answer Key**

<b>Page 1</b>	<b>Page 2</b>	<b>Page 3</b>	<b>Page 4</b>
1 = -70.0 = $-7.00 \times 10^1$	14 = 84300 = $8.43 \times 10^4$	27 = $-2.34 \times 10^{-13}$	39 = 15.1 = $1.51 \times 10^1$
2 = 53.0 = $5.30 \times 10^1$	15 = 86.0 = $8.60 \times 10^1$	28 = $9.83 \times 10^{-12}$	40 = 1.40 = $1.40 \times 10^0$
3 = -708 = $-7.08 \times 10^2$	16 = $-7.92 \times 10^6$	30 = 0.000598 = $5.98 \times 10^{-4}$	41 = $3.64 \times 10^{17}$
4 = 12.0 = $1.20 \times 10^1$	17 = 2.15 = $2.15 \times 10^0$	31 = 0.284 = $2.84 \times 10^{-1}$	42 = $8.93 \times 10^{11}$
5 = 32.0 = $3.20 \times 10^1$	18 = 0.000563 = $5.63 \times 10^{-4}$	32 = $4.69 \times 10^{-10}$	43 = 0.179 = $1.79 \times 10^{-1}$
6 = -91.5 = $-9.15 \times 10^1$	19 = 0.0310 = $3.10 \times 10^{-2}$	33 = $2.52 \times 10^6$	44 = 661000 = $6.61 \times 10^5$
7 = 22.9 = $2.29 \times 10^1$	20 = 0.212 = $2.12 \times 10^{-1}$	34 = 0.000339 = $3.39 \times 10^{-4}$	45 = 128000 = $1.28 \times 10^5$
8 = -2.34 = $-2.34 \times 10^0$	21 = 2.13 = $2.13 \times 10^0$		46 = 94500 = $9.45 \times 10^4$
9 = $1.39 \times 10^7$	22 = 0.0324 = $3.24 \times 10^{-2}$		
10 = $1.32 \times 10^{10}$	23 = 5.17 = $5.17 \times 10^0$	35 = -0.0280 = $-2.80 \times 10^{-2}$	47 = 10.5 = $1.05 \times 10^1$
11 = \$1.27	24 = 93.2 = $9.32 \times 10^1$	36 = 20.0 = $2.00 \times 10^1$	48 = 45.0 = $4.50 \times 10^1$
12 = 21.0 = $2.10 \times 10^1$	25 = 157 = $1.57 \times 10^2$	37 = 0.110 = $1.10 \times 10^{-1}$	49 = $1.80 \times 10^{-10}$
13 = 330 = $3.30 \times 10^2$	26 = 220 = $2.20 \times 10^2$	38 = 6.82 = $6.82 \times 10^0$	50 = $2.58 \times 10^8$

2022 – 2023 TMSCA Middle School Calculator Test 9 Answer Key

**Page 5**

$$\begin{aligned} 51 &= 1.91 \times 10^{-9} \\ 52 &= 1.45 \times 10^{14} \\ 53 &= 1.06 \times 10^8 \\ 54 &= -15600 \\ &= -1.56 \times 10^4 \\ 55 &= 0.503 \\ &= 5.03 \times 10^{-1} \\ 56 &= -0.0149 \\ &= -1.49 \times 10^{-2} \\ 57 &= 2.10 \\ &= 2.10 \times 10^0 \\ 58 &= -42.1 \\ &= -4.21 \times 10^1 \\ 59 &= 520 \\ &= 5.20 \times 10^2 \\ 60 &= 0.278 \\ &= 2.78 \times 10^{-1} \end{aligned}$$

**Page 6**

$$\begin{aligned} 61 &= 119 \\ &= 1.19 \times 10^2 \\ 62 &= 5.30 \times 10^8 \\ 63 &= 0.00167 \\ &= 1.67 \times 10^{-3} \\ 64 &= 339 \\ &= 3.39 \times 10^2 \\ 65 &= -12.8 \\ &= -1.28 \times 10^1 \\ 66 &= 0.00368 \\ &= 3.68 \times 10^{-3} \\ 67 &= 1.62 \\ &= 1.62 \times 10^0 \\ 68 &= -5.87 \\ &= -5.87 \times 10^0 \\ 69 &= -0.000121 \\ &= -1.21 \times 10^{-4} \\ 70 &= 25.2 \\ &= 2.52 \times 10^1 \end{aligned}$$

**Page 7**

$$\begin{aligned} 73 &= 219 \\ &= 2.19 \times 10^2 \\ 74 &= 57.7 \\ &= 5.77 \times 10^1 \\ 75 &= 2.40 \\ &= 2.40 \times 10^0 \\ 76 &= 6.65 \\ &= 6.65 \times 10^0 \\ 77 &= 4.06 \\ &= 4.06 \times 10^0 \\ 78 &= 743000 \\ &= 7.43 \times 10^5 \\ 79 &= 80100 \\ &= 8.01 \times 10^4 \\ 80 &= 1.76 \\ &= 1.76 \times 10^0 \end{aligned}$$

$$71 = \$1,616.17$$

$$72 = 203 \text{ INT.}$$

11.  $\frac{22.79}{18}$

12. These points form a rectangle that is 7 x 3. Area = 7(3)

13.  $\pi \text{ radians} = 180 \text{ degrees}$   
 $\frac{11}{6}\pi = \frac{11}{6}(180)$

24.  $\sqrt[4]{92(97)(95)(89)}$

25. Area =  $\frac{d^2}{2} = 12265$   
 $d = \sqrt{12265(2)}$

26.  $\left\{ \begin{array}{l} \text{angle 1} = x \\ \text{angle 2} = x \\ \text{angle 3} = 2x \\ \text{angle 4} = 2(4x) - 60 \end{array} \right\}$

The sum is 360 degrees.  
 $12x - 60 = 360$   
 $12x = 420; x = 35$   
 Largest angle is  $8(35) - 60$

35.  $-\frac{1}{\sqrt[8]{\pi^{25}}}$

36.  $x = \text{angle}$   
 $(180 - x) + (90 - x) = 230$   
 $270 - 2x = 230$   
 $-2x = -40; x = 20.0$

37. side =  $\sqrt{7.50 \times 10^{-4}}$   
 Perimeter =  $4(\sqrt{7.50 \times 10^{-4}})$

38.  $h = \frac{7.872(\sqrt{3})}{2}$

47.  $18\pi = 1 \text{ revolution}$   
 $18\pi(11772) \text{ in} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}}$

48. rate x time = distance

	Rate	Time	Distance
to	$x + 15$	1.5	$1.5(x + 15)$
from	$x$	2	$2x$

Distances are equal

$$1.5(x + 15) = 2x$$

$$1.5x + 22.5 = 2x$$

$$22.5 = .5x$$

$$\frac{22.5}{.5} = x$$

49.  $\sqrt{(5.21 \times 10^{-10})^2 - (4.89 \times 10^{-10})^2}$

50.  $\cos 71 = \frac{x}{7.91 \times 10^8}$

$$x = (7.91 \times 10^8)(\cos 71)$$

59. Area =  $\frac{1}{2}aP$   
 $\frac{1}{2}(12.650)(8.221)(10)$

60.

Roll	Ways to obtain
5	4
4	3
3	2
2	1

There are 36 possible rolls:  
 $\frac{4}{36} + \frac{3}{36} + \frac{2}{36} + \frac{1}{36}$

61. Area of circle minus area of triangle

Diameter =  $\sqrt{4^2 + 13^2}$

Radius =  $\frac{\sqrt{4^2 + 13^2}}{2}$

$$\pi r^2 - \frac{1}{2}bh$$

$$\pi \left( \frac{\sqrt{4^2 + 13^2}}{2} \right)^2 - \frac{1}{2}(4)(13)$$

62. Volume = Bh

$$B = \frac{\text{Perimeter}^2}{\left(\tan \frac{180}{n}\right)(4n)}$$

$$\left[ \frac{(551 \times 5)^2}{\left(\tan \frac{180}{5}\right)(20)} \right] [1015]$$

71. Total amount =

$$10000 \left( 1 + \frac{.03}{12} \right)^{(12 \times 5)}$$

Int = Total amount - 10,000 =

$$10000 \left( 1 + \frac{.03}{12} \right)^{(60)} - 10000$$

72.  $\frac{603}{3} = \text{Middle integer}$

Largest is  $\frac{603}{3} + 2$

73.  $360 - 62 = 298$

The sector is  $\frac{298}{360}$  of area of whole circle.

$$\pi r^2 \left( \frac{298}{360} \right) = 124698$$

$$r = \sqrt{\left( \frac{124698}{\pi} \right) \left( \frac{360}{298} \right)}$$

74. Side =  $\sqrt[3]{36963}$

Diagonal =  $(\sqrt[3]{36963})(\sqrt{3})$

