

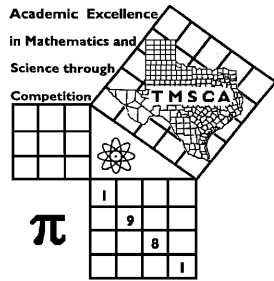
8 1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ <b>Final Score</b>
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

## 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 # 8 ©

JANUARY 19, 2019

### 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<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.

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:  $\pi$  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.

**2018-2019 TMSCA Middle School Calculator Test 8**

1.  $1460 - 2450$  ----- 1= \_\_\_\_\_

2.  $15 - 4 + 5$  ----- 2= \_\_\_\_\_

3.  $-128 + 350 - 91$  ----- 3= \_\_\_\_\_

4.  $31 - 33 - 41 + 19$  ----- 4= \_\_\_\_\_

5.  $189 + 152 - 128 - 176$  ----- 5= \_\_\_\_\_

6.  $74.9 - 189 - 195 + 162 + 208$  ----- 6= \_\_\_\_\_

7.  $1.59 + 1.17 - 0.941 + 1.62 + 0.503$  ----- 7= \_\_\_\_\_

8.  $2.45 - 1.77 + 4.21 - 3.58 - \pi$  ----- 8= \_\_\_\_\_

9.  $41.2 \times 104 \times 463$  ----- 9= \_\_\_\_\_

10.  $663 \times 110 \times 763 \times 38$  ----- 10= \_\_\_\_\_

11. Calculate the sum of the sixth root of nine, thirteen to the twelfth power and negative fifteen squared. ----- 11= \_\_\_\_\_

12. Sandra worked every problem through number 75 on her calculator test. She missed one fifth of the problems she worked. Calculate her score. ----- 12= \_\_\_\_\_ INT.

13. Sixteen and three-fourths is what percent of one hundred twenty. 13= \_\_\_\_\_ %

14.  $(127)[213 \times 109 \times 208]$  -----14= \_\_\_\_\_

15.  $(-79/156)[503 - 130]$  -----15= \_\_\_\_\_

16.  $\{(59)(78 - 93)(192)\} - 1.19 \times 10^5$  -----16= \_\_\_\_\_

17.  $\left[\frac{266}{331}\right] [(54/433) + 0.0907]$  -----17= \_\_\_\_\_

18.  $\frac{(55/94) + (74/188)}{(0.509 - 0.424)}$  -----18= \_\_\_\_\_

19.  $\left[\frac{(1120/902) - (1550/482)}{17.8/(12.1)}\right]$  -----19= \_\_\_\_\_

20.  $\frac{(0.00359)(1.15)}{4.59} (19.7 - 3.3)$  -----20= \_\_\_\_\_

21.  $\frac{1500 + 824 + 2270}{(0.0387)(16.9)(36.4)}$  -----21= \_\_\_\_\_

22.  $\frac{[-(1050 + 2800)(1900 - 1550)]}{(0.0878/(124))}$  -----22= \_\_\_\_\_

23.  $\frac{(\pi)(84/90)(160/70)}{(38/36)}$  -----23= \_\_\_\_\_

24. Abbey and her friend were given \$15.00 to spend at the candy store. They purchased 2 suckers for 75¢ each, 4 licorice ropes for 35¢ each and a pound and a half of chocolate covered almonds for \$6.99 per pound. Calculate how much money they have left after their purchase. -----24=\$ \_\_\_\_\_

25. If Set M has 41 elements and Set T has 32 elements, calculate the number of elements in the Cartesian product set. -----25= \_\_\_\_\_ INT.

26. Three consecutive integers have a sum of 393. Calculate the square root of the largest integer. -----26= \_\_\_\_\_

27.  $[227 - (759 + 269)] + [(0.37)(536 - 1490)]$  -----27= \_\_\_\_\_

28.  $(74.4)[(0.84/2.7)(0.0012 + 0.00114)]$  -----28= \_\_\_\_\_

29.  $\frac{(1.25 \times 10^{10}) + (3.03 \times 10^{10})}{(-0.408)(0.135) - 0.0114}$  -----29= \_\_\_\_\_

30.  $\frac{1}{-82} + \frac{1}{(\pi)(13.5 - 58.1)}$  -----30= \_\_\_\_\_

31.  $\frac{1}{135} + \frac{1}{(1280 - 991)}$  -----31= \_\_\_\_\_

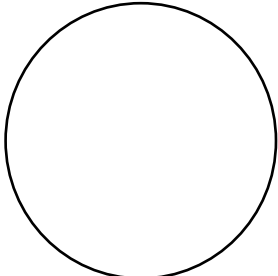
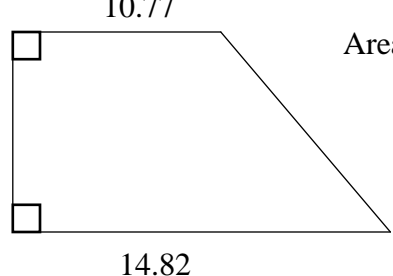
32.  $\frac{(54.6 + 298)}{(1.75 \times 10^{12})}$  -----32= \_\_\_\_\_

33.  $\frac{1}{101} - \frac{1}{(186 + 45.5)}$  -----33= \_\_\_\_\_

34.  $\frac{1}{407} - \frac{1}{484} + \frac{1}{82.9}$  -----34= \_\_\_\_\_

35. Calculate the harmonic mean of the Log 62,  $e^5$ , ln 51, and pi to the ninth power. -----35= \_\_\_\_\_

36. A cube has a volume of 1313 cubic meters. Calculate the volume of the cube in cubic feet. -----36= \_\_\_\_\_ ft.<sup>3</sup>

CIRCLE	TRAPEZOID
 <p style="margin-left: 20px;">Circumference = 801.98</p> <p style="margin-left: 20px;">Area = ?</p>	 <p style="margin-left: 20px;">Area = 138.83</p> <p style="margin-left: 20px;">Height = ?</p>
37= _____	38= _____

39.  $\left[ \frac{311 + (1/(9.59 \times 10^{-4}))}{(369/1190) - 0.0846} \right]^2$  -----39= \_\_\_\_\_

40.  $(0.702 + 1.01 + 0.388)^2(345 + 366)^2$  -----40= \_\_\_\_\_

41.  $\frac{(50300 + 9460)^2}{(0.00645 - 0.00712)^3}$  -----41= \_\_\_\_\_

42.  $(1/(0.0263))(38100 - 23600)^3$  -----42= \_\_\_\_\_

43.  $\sqrt{20900 - 4270 + 16200} - \sqrt{25000}$  -----43= \_\_\_\_\_

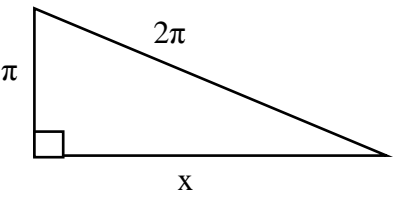
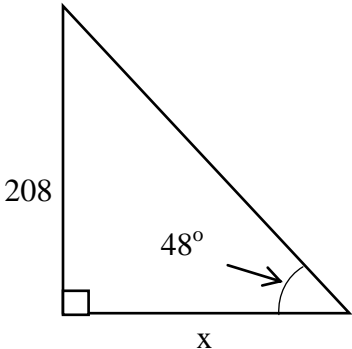
44.  $(1/\pi)\sqrt{\frac{0.155 + 0.04}{3.65 - 2.9}}$  -----44= \_\_\_\_\_

45.  $\frac{1}{\sqrt{3690 + 1010 + 2390}} + \left(\frac{1}{\sqrt{6.84}}\right)^3$  -----45= \_\_\_\_\_

46.  $\sqrt[4]{3.44 - 108/141} + 1/\sqrt{0.0187 + 0.00489}$  -----46= \_\_\_\_\_

47. Calculate the product of the roots of  $7x + 3x^2 = -8$ . -----47= \_\_\_\_\_

48. Calculate the number of distinct diagonals in a polygon with 89 sides. -----48= \_\_\_\_\_ INT.

<p style="text-align: center;"><b>RIGHT TRIANGLE</b></p>  <p style="text-align: center;"><math>x = ?</math></p> <p>49= _____</p>	<p style="text-align: center;"><b>RIGHT TRIANGLE</b></p>  <p style="text-align: center;"><math>x = ?</math></p> <p>50= _____</p>
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51.  $\left[ \frac{\sqrt{\sqrt{6.77 - 1.85}}}{-(28600 - 2.42 \times 10^5)} \right]^2 [13700 + 4480]$  -----51= \_\_\_\_\_

52.  $\frac{(0.0217 + 0.0123 - 0.0287)^3}{\sqrt{0.0399 + 0.0345 + 0.103}}$  -----52= \_\_\_\_\_

53.  $\frac{\sqrt{3.18 + \pi + 2.62}}{(0.0805 - 0.12 + 0.227)^4}$  -----53= \_\_\_\_\_

54.  $\sqrt{\frac{1/(7.28 - 4.17)}{(109)(31.1 + 38.4)^4}}$  -----54= \_\_\_\_\_

55.  $0.93 + \sqrt{(38.3)/(26.6)} - (0.164 + 0.152)^2$  -----55= \_\_\_\_\_

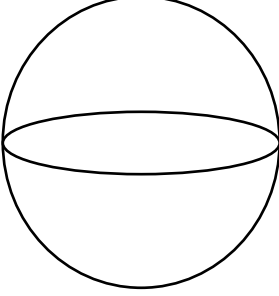
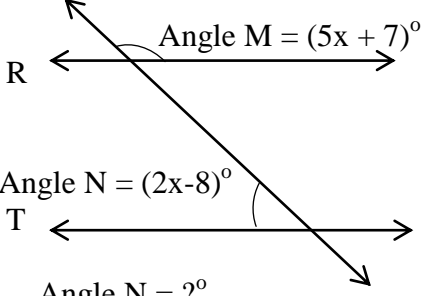
56.  $(0.306)^2 \sqrt{(1.5)/(9.23)} - (0.0272 + 0.0334)$  -----56= \_\_\_\_\_

57.  $\sqrt{\frac{(32.5)(3040)}{(223) + (152)}} - 28$  -----57= \_\_\_\_\_

58.  $\sqrt{\frac{1/(79.5 - 58.4)}{(1310)(3.07 + 14)^5}}$  -----58= \_\_\_\_\_

59. If 18 people complete a project in 13 days working 8 hours a day, calculate how many days it would take 10 people working 7 hours a day to complete the project. -----59= \_\_\_\_\_ days

60. A right cylindrical water tank can hold 523,000 gallons of water. The diameter of the tank is 32 feet. Calculate the height of the tank in feet. -----60= \_\_\_\_\_ ft.

<p style="text-align: center;"><b>SPHERE</b></p> <div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: left;"> <p>Surface Area = 12521</p> <p>Diameter = ?</p> </div> </div> <p>61= _____</p>	<p style="text-align: center;"><b>PARRALLEL LINES CUT BY A TRANSVERSAL</b></p> <div style="text-align: center;">  </div> <p>Angle M = <math>(5x + 7)^\circ</math></p> <p>Angle N = <math>(2x - 8)^\circ</math></p> <p>Angle N = <math>?\circ</math></p> <p>62= _____</p>
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63.  $\frac{25!}{7!} + 22!$  ----- 63= \_\_\_\_\_

64. (deg)  $\frac{\sin(44^\circ)}{106}$  ----- 64= \_\_\_\_\_

65. (deg)  $(568 - 509)\sin(355^\circ)$  ----- 65= \_\_\_\_\_

66. (deg)  $\cos(423^\circ - 385^\circ) + 0.113$  ----- 66= \_\_\_\_\_

67. (deg)  $[730]\sin(57.8^\circ - 12.7^\circ)$  ----- 67= \_\_\_\_\_

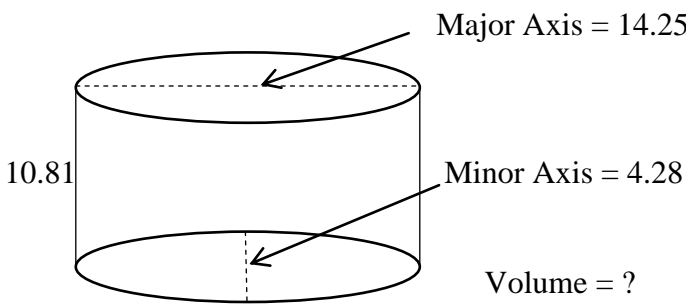
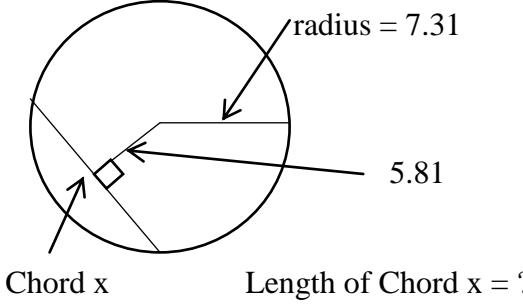
68. (deg)  $\frac{\sin(115^\circ)}{\tan(115^\circ)}[165]$  ----- 68= \_\_\_\_\_

69. (deg)  $\frac{\sin(17^\circ) - \tan(17^\circ)}{\sin(17^\circ)}$  ----- 69= \_\_\_\_\_

70.  $(155 + 175 + 194)^{2/5}$  ----- 70= \_\_\_\_\_

71. Calculate the odds of rolling a sum of 7 on a standard pair of dice. ----- 71= \_\_\_\_\_

72. If an automobile tire is 32 inches in diameter and rotates at 800 revolutions per minute, calculate the speed of the car in miles per hour. ----- 72= \_\_\_\_\_ mph.

RIGHT ELLIPTICAL SOLID	CHORD OF A CIRCLE
 <p style="text-align: right;">Volume = ?</p>	 <p style="text-align: right;">Length of Chord x = ?</p>
73= _____	74= _____

75.  $\frac{(4.6)^{0.523}(1.3)^{0.673}}{(0.673 - 0.337)^{-9}}$  ----- 75= \_\_\_\_\_

76.  $\frac{0.0231 + \sqrt{(0.0217)(0.029)} + (0.128)(0.258)}{\sqrt{\sqrt{9.99 + 9.22}}}$  ----- 76= \_\_\_\_\_

77.  $2\text{Log}\sqrt{\frac{(70.3)(0.384)}{78.6 + 115}}$  ----- 77= \_\_\_\_\_

78.  $(3.18)^\pi(0.125)^4(602 - 141)^2$  ----- 78= \_\_\_\_\_

79.  $1 + 3 + 5 + \dots + 765$  ----- 79= \_\_\_\_\_

80.  $1 + \frac{(0.829)^4}{2} - \frac{(0.829)^6}{6} + \frac{(0.829)^8}{24} - \frac{(0.829)^{10}}{120}$  ----- 80= \_\_\_\_\_



## 2018-2019 TMSCA Middle School Calculator Test 8 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = -990 = $-9.90 \times 10^2$	14 = $6.13 \times 10^8$	27 = -1150 = $-1.15 \times 10^3$	39 = $3.60 \times 10^7$
2 = 16.0 = $1.60 \times 10^1$	15 = -189 = $-1.89 \times 10^2$	28 = 0.0542 = $5.42 \times 10^{-2}$	40 = $2.23 \times 10^6$
3 = 131 = $1.31 \times 10^2$	16 = -289000 = $-2.89 \times 10^5$	29 = $-6.44 \times 10^{11}$	41 = $-1.19 \times 10^{19}$
4 = -24.0 = $-2.40 \times 10^1$	17 = 0.173 = $1.73 \times 10^{-1}$	30 = -0.0193 = $-1.93 \times 10^{-2}$	42 = $1.16 \times 10^{14}$
5 = 37.0 = $3.70 \times 10^1$	18 = 11.5 = $1.15 \times 10^1$	31 = 0.0109 = $1.09 \times 10^{-2}$	43 = 23.1 = $2.31 \times 10^1$
6 = 60.9 = $6.09 \times 10^1$	19 = -1.34 = $-1.34 \times 10^0$	32 = $2.01 \times 10^{-10}$	44 = 0.162 = $1.62 \times 10^{-1}$
7 = 3.94 = $3.94 \times 10^0$	20 = 0.0148 = $1.48 \times 10^{-2}$	33 = 0.00558 = $5.58 \times 10^{-3}$	45 = 0.0678 = $6.78 \times 10^{-2}$
8 = -1.83 = $-1.83 \times 10^0$	21 = 193 = $1.93 \times 10^2$	34 = 0.0125 = $1.25 \times 10^{-2}$	46 = 7.79 = $7.79 \times 10^0$
9 = $1.98 \times 10^6$	22 = $-1.90 \times 10^9$	35 = 4.88 = $4.88 \times 10^0$	47 = 2.67 = $2.67 \times 10^0$
10 = $2.11 \times 10^9$	23 = 6.35 = $6.35 \times 10^0$	36 = 46400 = $4.64 \times 10^4$	48 = 3827 INT.
11 = $2.33 \times 10^{13}$	24 = \$1.62	37 = 51200 = $5.12 \times 10^4$	49 = 5.44 = $5.44 \times 10^0$
12 = 240 INT.	25 = 1312 INT.	38 = 10.9 = $1.09 \times 10^1$	50 = 187 = $1.87 \times 10^2$
13 = 14.0 = $1.40 \times 10^1$	26 = 11.5 = $1.15 \times 10^1$		

## 2018-2019 TMSCA Middle School Calculator Test 8 Answer Key

### Page 5

$$51 = 8.85 \times 10^{-7}$$

$$52 = 3.53 \times 10^{-7}$$

$$53 = 2420 \\ = 2.42 \times 10^3$$

$$54 = 1.12 \times 10^{-5}$$

$$55 = 2.03 \\ = 2.03 \times 10^0$$

$$56 = -0.0229 \\ = -2.29 \times 10^{-2}$$

$$57 = -11.8 \\ = -1.18 \times 10^1$$

$$58 = 5.00 \times 10^{-6}$$

$$59 = 26.7 \\ = 2.67 \times 10^1$$

$$60 = 86.9 \\ = 8.69 \times 10^1$$

### Page 6

$$61 = 63.1 \\ = 6.31 \times 10^1$$

$$62 = 43.7 \\ = 4.37 \times 10^1$$

$$63 = 4.20 \times 10^{21}$$

$$64 = 0.00655 \\ = 6.55 \times 10^{-3}$$

$$65 = -5.14 \\ = -5.14 \times 10^0$$

$$66 = 0.901 \\ = 9.01 \times 10^{-1}$$

$$67 = 517 \\ = 5.17 \times 10^2$$

$$68 = -69.7 \\ = -6.97 \times 10^1$$

$$69 = -0.0457 \\ = -4.57 \times 10^{-2}$$

$$70 = 12.2 \\ = 1.22 \times 10^1$$

$$71 = 0.200 \\ = 2.00 \times 10^{-1}$$

$$72 = 76.2 \\ = 7.62 \times 10^1$$

### Page 7

$$73 = 518 \\ = 5.18 \times 10^2$$

$$74 = 8.87 \\ = 8.87 \times 10^0$$

$$75 = 0.000145 \\ = 1.45 \times 10^{-4}$$

$$76 = 0.0388 \\ = 3.88 \times 10^{-2}$$

$$77 = -0.856 \\ = -8.56 \times 10^{-1}$$

$$78 = 1970 \\ = 1.97 \times 10^3$$

$$79 = 147000 \\ = 1.47 \times 10^5$$

$$80 = 1.19 \\ = 1.19 \times 10^0$$

TMSCA 18-19 MS CA Test #8 Solutions to Word and Geometry Problems

11.  $\sqrt[6]{9} + 13^{12} + (-15)^2$

12.  $75 \times 5 - 15 \times 9$

13.  $\frac{x}{100} = \frac{16\frac{3}{4}}{120}; x = \frac{(16\frac{3}{4})(100)}{120}$

24.  $15 - 2(.75) - 4(.35) - 1.5(6.99)$

25. 41(32) INTEGER

26.  $\frac{393}{3} =$  middle integer so largest is 132.  $\sqrt{132}$

35. Harmonic mean is the reciprocal of the average of the reciprocals.

$$1 \div \left[ \left( \frac{1}{\log 62} + \frac{1}{e^5} + \frac{1}{\ln 51} + \frac{1}{\pi^9} \right) \div 4 \right]$$

36.  $1 m^3 = 100^3 cm^3$   
 $1 in^3 = 2.54^3 cm^3$   
 $1 ft^3 = 12^3$  or  $1728 in^3$   
 $1313 \cdot \frac{100^3}{1} \cdot \frac{1}{(2.54)^3} \cdot \frac{1}{1728}$

37.  $r = \frac{801.98}{2\pi}$   $A = \pi \left( \frac{801.98}{2\pi} \right)^2$

38.  $138.83 = \frac{1}{2}(14.82 + 10.77)h$  so

$$h = \frac{138.83(2)}{14.82 + 10.77}$$

47.  $3x^2 + 7x + 8 = 0$  The product of the roots is  $c/a$  where  $c = 8$  and  $a = 3$ .  $\frac{8}{3}$

48.  $\frac{n(n-3)}{2} = \frac{89(86)}{2}$

49.  $\sqrt{(2\pi)^2 - \pi^2}$

50.  $\frac{\tan 48}{1} = \frac{208}{x}$  so  
 $x = \frac{208}{\tan 48}$

59.  $18(13)(8) = 10(7)(x)$   
 $x = \frac{18(13)(8)}{10(7)}$

60. 231 cubic inches = 1 gal  
 $12^3 = 1728$  cu. in =  $1 ft^3$   
 Radius = 16 ft.  
 $\frac{523000(231)}{1728} =$  cu. ft. = V

$$\pi r^2 h = V; h = \frac{V}{\pi r^2}$$

$$h = \frac{523000(231)}{\pi(16)^2}$$

61.  $4\pi r^2 = 12521$

$$r = \sqrt{\frac{12521}{4\pi}}$$

$$d = 2 \left[ \sqrt{\frac{12521}{4\pi}} \right]$$

62.  $5x + 7 + 2x - 8 = 180$

$$x = \frac{181}{7}$$

$$\text{angle } N = 2 \left( \frac{181}{7} \right) - 8$$

71. 6 ways to roll a 7, 30 ways to not roll a 7. Odds:

$$\frac{6}{30}$$

72.  $C = 32\pi$

In one minute the distance traveled is  $32\pi(800)$  inches  
 $\frac{32\pi(800)}{1 \text{ min}} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} \cdot \frac{60 \text{ min}}{1 \text{ hr}}$

73.  $V = \pi \left( \frac{14.25}{2} \right) \left( \frac{4.28}{2} \right) 10.81$

74. Draw a radius from center to end of chord x. This forms a right triangle with  $c = 7.31$ ,  $a = 5.81$ . Find b.

$$b = \sqrt{7.31^2 - 5.81^2}$$

Chord x =

$$2 \left( \sqrt{7.31^2 - 5.81^2} \right)$$