

**Precalculus Unit 5: Worksheet 5.1-5.3**  
**(10 points)**

Make sure you pay attention to the units on the angles – radians or degrees when using your calculator. You may use your unit circle.

1. Find two co-terminal angles, one positive and one negative, to  $\theta = \frac{8\pi}{15}$ .
  
  
  
  
  
  
  
  
  
  
2. Convert  $\theta = \frac{3\pi}{5}$  to degrees.
  
  
  
  
  
  
  
  
  
  
3. The central angle  $\theta$  of a circle with radius 5 inches subtends an arc of 15 inches. Find  $\theta$ .
  
  
  
  
  
  
  
  
  
  
4. A circle of radius  $r$  has a central angle of  $\theta = 45^\circ$  which subtends an arc of 16 inches. Find  $r$  accurate to the hundredths place (2 decimals).
  
  
  
  
  
  
  
  
  
  
5. Give the exact values of all six trigonometric functions for  $\theta = \frac{11\pi}{3}$ .

$$\sin \frac{11\pi}{3} =$$

$$\csc \frac{11\pi}{3} =$$

$$\cos \frac{11\pi}{3} =$$

$$\sec \frac{11\pi}{3} =$$

$$\tan \frac{11\pi}{3} =$$

$$\cot \frac{11\pi}{3} =$$

6. Give the exact value (leave in root form, not decimal) of the following:

a.)  $\tan \frac{-7\pi}{6}$

b.)  $\csc \frac{3\pi}{2}$

c.)  $\cos \frac{13\pi}{4}$

d.)  $\tan \frac{5\pi}{2}$

7. A right triangle has an acute angle  $\theta$  such that  $\csc \theta = \frac{7}{3}$ . Draw an appropriate triangle and find the values of the remaining five trigonometric functions.

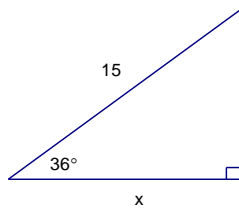
$$\sin \theta =$$

$$\cos \theta = \qquad \sec \theta =$$

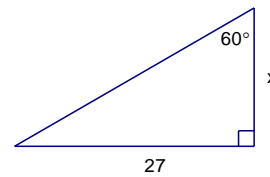
$$\tan \theta = \qquad \cot \theta =$$

8. Find the value of  $x$  in each of the following triangles accurate to the hundredths place.

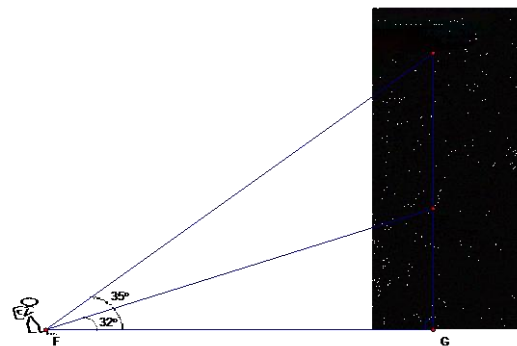
a.)



b.)



9. To measure the height of Lincoln's caricature on Mt. Rushmore, two sightings 800 feet from the base of the mountain are taken. If the angle of elevation to the bottom of Lincoln's face is  $32^\circ$  and the angle of elevation to the top is  $35^\circ$ , what is the height of Lincoln's face?



10. A neighborhood carnival has a merry-go-round whose radius is 25 feet. If the time for one revolution is 30 seconds, how fast is the merry-go-round going (for a point on the outer edge). Find the linear speed in feet per second and miles per hour.