

1. (2pts) Convert into the other angle measure (radians or degrees). Show how you computed your number.

$$70^\circ =$$

$$\frac{7\pi}{6} \text{radians} =$$

2. (8pts) Without using the calculator, find the exact values of the following trigonometric expressions. Draw the unit circle and the appropriate angle under the expression.

$$\cos 150^\circ =$$

$$\tan \frac{4\pi}{3} =$$

$$\sec(-270^\circ) =$$

$$\sin \frac{26\pi}{3} =$$

3. (2pts) Use your calculator to evaluate (round to 4 decimals):

$$\sec 115^\circ =$$

$$\tan \frac{4\pi}{9} =$$

4. (5pts) In a right triangle, the leg opposite angle θ has length 3 and the hypotenuse has length 8. Compute $\cos \theta$, $\csc \theta$ and $\tan \theta$.

5. (5pts) Use fundamental identities and complementary angles to simplify:

$$\frac{\sin 40^\circ}{\sin 50^\circ} - \tan 40^\circ =$$

$$\sin 65^\circ \csc 65^\circ + \cos 41^\circ \csc 49^\circ =$$

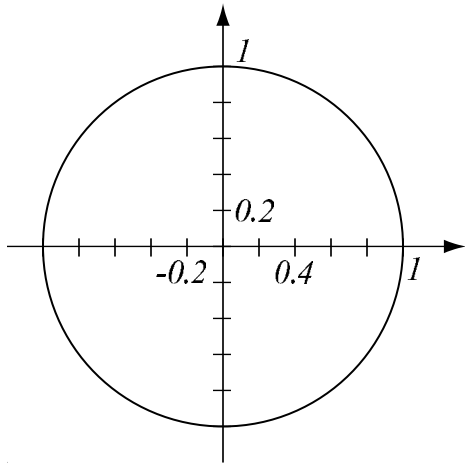
6. (4pts) Use the odd-even and periodicity properties to figure out:

a) If $\sin \theta = 0.7$, what is $\sin(-\theta)$?

b) If $\cos \theta = -0.35$, what is $\cos(-\theta)$?

c) If $\sin \theta = 0.15$, what is $\sin \theta + 2 \sin(\theta + 4\pi) - 3 \sin(\theta - 6\pi)$?

7. (4pts) Use the picture below to estimate $\sin \frac{5\pi}{8}$ and $\cos \frac{5\pi}{8}$. Compare your answer with results you get with a calculator.



	estimate	calculator
$\cos \left(\frac{5\pi}{8} \right) =$		
$\sin \left(\frac{5\pi}{8} \right) =$		

8. (5pts) If $\cos \theta = \frac{1}{3}$ and θ is in the fourth quadrant, find $\sin \theta$, $\cot \theta$, $\sec \theta$. Draw a picture.

9. (5pts) A Ferris wheel of diameter 70ft has rotated 35° between two stops. What is the distance (length of arc) that a point on the rim of the Ferris wheel has traveled?

10. (5pts) The Moon revolves around Earth on an approximately circular orbit with radius 384,400km. What is the Moon's linear speed (in km/hr) if it completes one full revolution in 27.32 days?

11. (5pts) A ship is just offshore of New York City. A sighting is taken of the Statue of Liberty, which about 305 feet tall. If the angle of elevation to the top of the statue is 20° , how far is the ship from the base of the statue?

Bonus. (5pts) Find the area of a right triangle, if its hypotenuse is 6cm and one of its angles is 37° .