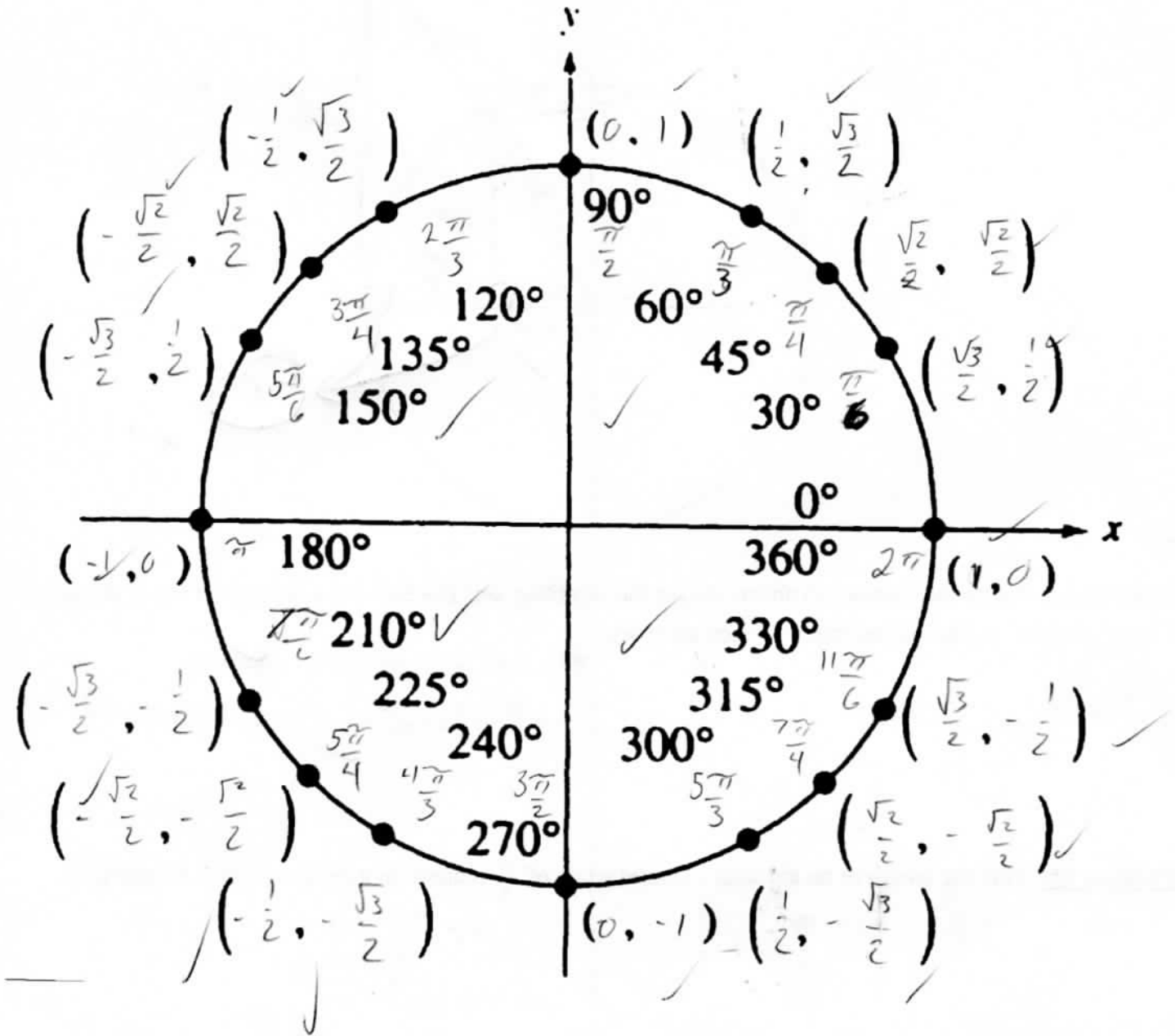


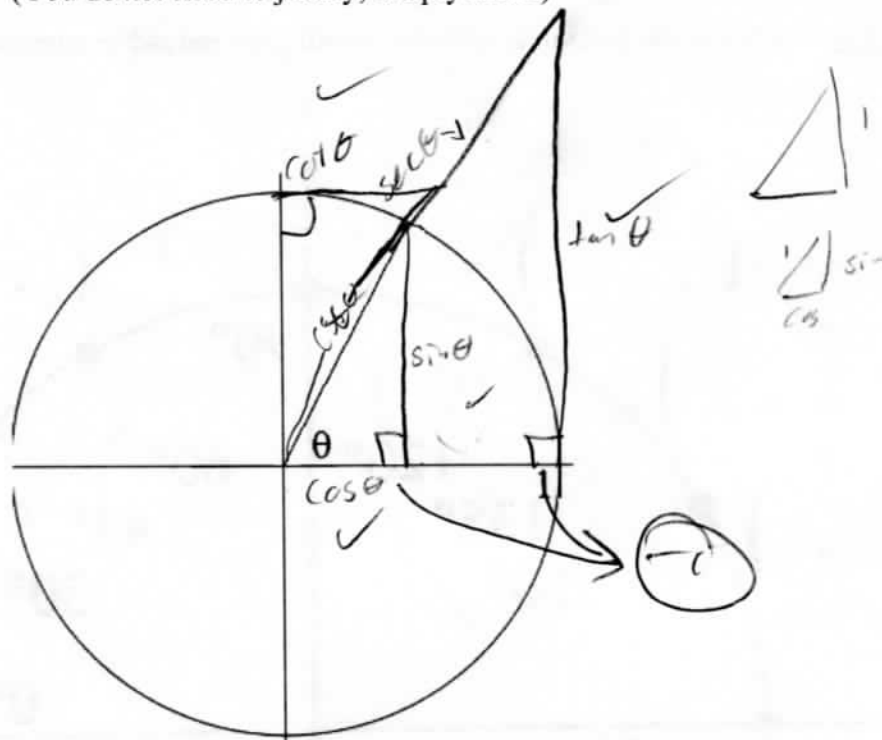
Name: _____

Mathematics 1613: Trigonometry Quiz #4

Problem 12: Complete the unit circle with the coordinates and radian measure of each angle:



Problem 13: Given the following angle on the unit circle, construct and label the lengths corresponding to the six basic trigonometric functions. (You do *not* need to justify, simply label.)



Problem 14: Using the diagram(s) above, derive the identities $\sin^2 \theta + \cos^2 \theta = 1$, $1 + \tan^2 \theta = \sec^2 \theta$, and $1 + \cot^2 \theta = \csc^2 \theta$ (that is, explain why they are true).

They are all Pythagorean identities
 $(\sin \theta)^2 + (\cos \theta)^2 = 1^2 \rightarrow \sin^2 \theta + \cos^2 \theta = 1$

Problem 15: Find the length of an arc with a central angle of $\frac{\pi}{5}$ radians on a circle of radius 6 inches.

$$\frac{\pi}{5} \times \frac{2\pi}{2\pi} = \frac{1}{10}$$

$$(2\pi r) \left(\frac{1}{10}\right)$$

$$(2\pi 6) \left(\frac{1}{10}\right)$$

$$(6\pi) \left(\frac{1}{5}\right) = \frac{6\pi}{5} \checkmark$$

Problem 16: Use the unit circle to evaluate the following trigonometric values:

$$\cos\left(\frac{5\pi}{4}\right) = -\frac{\sqrt{2}}{2} \checkmark$$

$$\csc\left(\frac{7\pi}{6}\right) = -2 \checkmark$$

$$\tan\left(\frac{3\pi}{2}\right) = \text{undefined} \checkmark$$