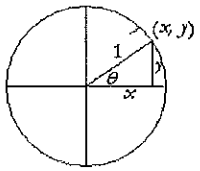
Exam Review– Unit Circle & Equations
Algebra 2

Name Key 2013-14

Hour _____ Date _____

Unit Circle – has a radius = 1 and a center at (0,0) with terminal side ending at the point (x,y).



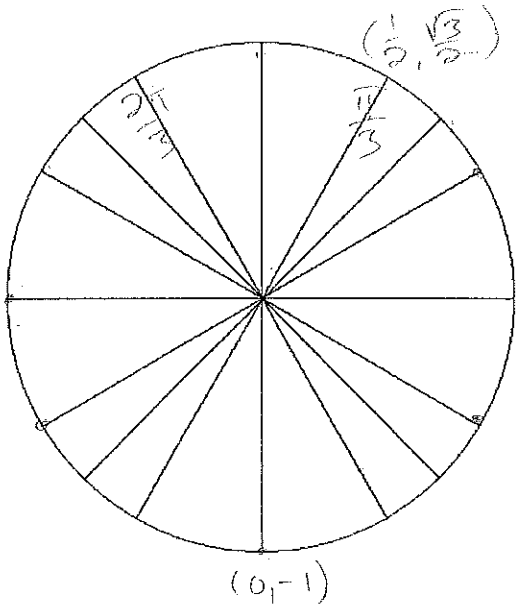
1. List the 6 trig ratios for the unit circle in terms of x and y.

$\cos = x$ $\quad \sec = \text{flip } \cos$

$\sin = y$ $\quad \csc = \text{flip } \sin$

$\tan = \frac{y}{x}$ $\quad \cot = \frac{x}{y}$

2. Label the coordinates of the points on the unit circle below. (Assume multiples of 30° & 45° on the unit circle):



3. List the 6 trig ratios for each of the following angle measures:

a. $\frac{\pi}{3}$

$\cos\frac{\pi}{3} = \frac{1}{2}$ $\quad \sec\frac{\pi}{3} = 2$

$\sin\frac{\pi}{3} = \frac{\sqrt{3}}{2}$ $\quad \csc\frac{\pi}{3} = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

$\tan\frac{\pi}{3} = \frac{\sqrt{3}}{2} \cdot \frac{2}{1} = \sqrt{3}$ $\quad \cot\frac{\pi}{3} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

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

$\cos\frac{2\pi}{3} = -\frac{1}{2}$ $\quad \sec\frac{2\pi}{3} = -2$

$\sin\frac{2\pi}{3} = \frac{\sqrt{3}}{2}$ $\quad \csc\frac{2\pi}{3} = \frac{2\sqrt{3}}{3}$

$\tan\frac{2\pi}{3} = -\sqrt{3}$ $\quad \cot\frac{2\pi}{3} = -\frac{\sqrt{3}}{3}$

c. 270°

$\cos 270 = 0$ $\quad \sec 270 = \text{und}$

$\sin 270 = -1$ $\quad \csc 270 = -1$

$\tan 270 = \text{und}$ $\quad \cot 270 = 0$

4. We can also "go backwards". We can solve for an angle when we know the trig ratio. It is important to know ASTC! Give answers in degrees & radians.

a. $\sin\theta = -\frac{\sqrt{2}}{2}$

$\theta = 225^\circ, 315^\circ$
or
$\frac{5\pi}{4}, \frac{7\pi}{4}$

b. $\cos\theta = -1$

$\theta = 180^\circ$
or
π

5. Some equations may involve some algebra before solving. Solve each of the equations below. Give answers in degrees and radians.

a. $2\sin\theta + 1 = 0$

$\sin\theta = -\frac{1}{2}$

$\theta = 210^\circ, 330^\circ$
or
$\frac{7\pi}{6}, \frac{11\pi}{6}$

b. $2\cos\theta - \sqrt{3} = 0$

$\cos\theta = \frac{\sqrt{3}}{2}$

$\theta = 30^\circ, 330^\circ$
or
$\frac{\pi}{6}, \frac{11\pi}{6}$