

Homework this week:

01: Sign up for Khan Academy with coach code 4CG5S2.

02: Read sections 5.1 and 5.2 in your textbook

03: Textbook problems

5.1 #1, 2, 7-18 all, 31-73 odd

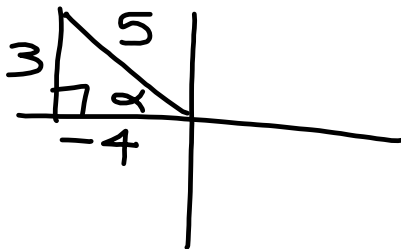
5.2: #1-6 all; 15-41 odd; 59-75 odd (NO CALCULATOR!)

This will mostly be completed in class and will be due this Friday.

See syllabus for proper formatting of written homework assignments.

36. Given that $\cos \alpha = -\frac{4}{5}$ and $\alpha \in QII$,

find the other 5 trigonometric function values of α .



$$\sin \alpha = \frac{3}{5}$$

$$\tan \alpha = -\frac{3}{4}$$

$$\sec \alpha = -\frac{5}{4}$$

$$\csc \alpha = \frac{5}{3}$$

$$\cot \alpha = -\frac{4}{3}$$

The unit circle and function values of 30°, 45°, and 60° reference angles

unit circle:

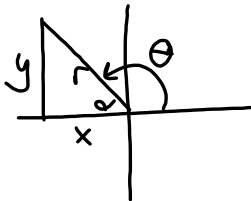
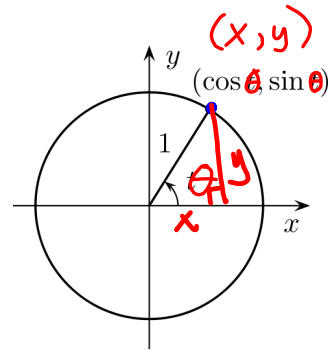
radius $r = 1$

center $(0, 0)$

$$(x-h)^2 + (y-k)^2 = r^2$$

center: (h, k) ; radius: r

$$x^2 + y^2 = 1$$

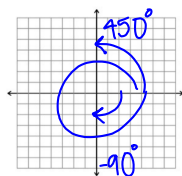
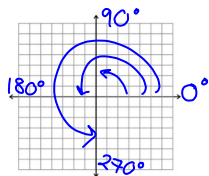


$$\sin \theta = \frac{y}{r} \quad y = r \sin \theta$$

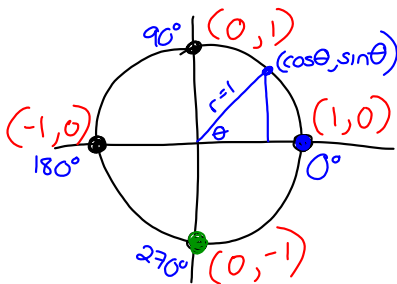
$$\cos \theta = \frac{x}{r} \quad x = r \cos \theta$$

What about quadrantal angles?

An angle whose terminal side falls on an axis is called a quadrantal angle.



$$\frac{\text{opp}}{\text{adj}} = \frac{\text{opp}}{\text{hyp}} = \frac{\text{adj}}{\text{hyp}}$$



Reciprocal Identities

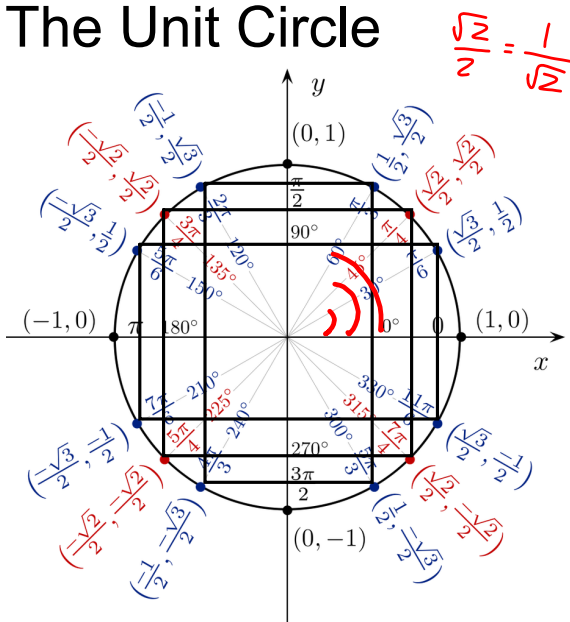
$$\begin{aligned} \csc x &= \frac{1}{\sin x}, & \sin x &= \frac{1}{\csc x} \\ \sec x &= \frac{1}{\cos x}, & \cos x &= \frac{1}{\sec x} \\ \cot x &= \frac{1}{\tan x}, & \tan x &= \frac{1}{\cot x} \end{aligned}$$

Ratio Identities

$$\tan x = \frac{\sin x}{\cos x}, \quad \cot x = \frac{\cos x}{\sin x}$$

$$\begin{aligned} \tan 0^\circ &= \frac{\sin 0^\circ}{\cos 0^\circ} = \frac{0}{1} = \boxed{0} \\ \sec 270^\circ &= \frac{1}{\cos 270^\circ} = \frac{1}{0} = \boxed{\text{undef.}} \end{aligned}$$

The Unit Circle



Common angles:
(memorize!)

$$\frac{\pi}{6} = 30^\circ$$

$$\frac{\pi}{4} = 45^\circ$$

$$\frac{\pi}{3} = 60^\circ$$

Note:

$$\frac{k\pi}{6} \rightarrow 30^\circ \text{ ref. } \angle$$

$$\frac{k\pi}{4} \rightarrow 45^\circ \text{ ref. } \angle$$

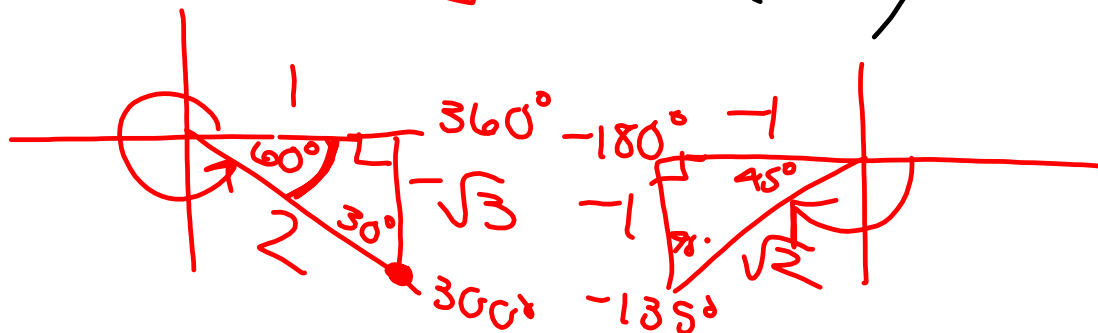
$$\frac{k\pi}{3} \rightarrow 60^\circ \text{ ref. } \angle$$

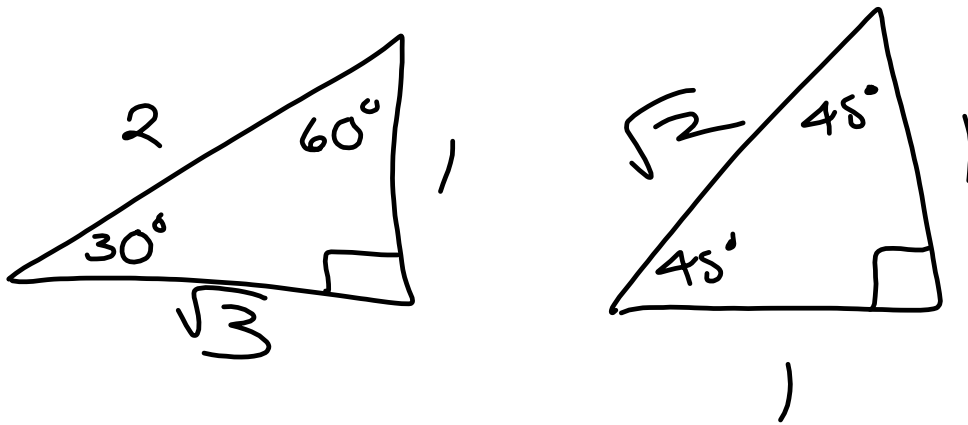
$$\frac{k\pi}{2} \rightarrow 90^\circ \text{ or } 270^\circ$$

$k\pi \rightarrow 0^\circ$ for k even;
 180° for k odd

Find the trig function value of the given angle (note that they all have either a 30°, 45°, or 60° reference angle OR are quadrantal angles).

$$\tan 300^\circ = \boxed{-\sqrt{3}} \quad \sec(-135^\circ) = \boxed{-\sqrt{2}}$$





Evaluate the trigonometric function of an angle given in radians

$\cos \frac{11\pi}{6} = \frac{\sqrt{3}}{2}$

$\sin 329\pi = 0$

$\tan \frac{7\pi}{2} = \frac{\sin \frac{7\pi}{2}}{\cos \frac{7\pi}{2}} = \frac{-1}{0} = \text{undef}$

$\sec \frac{5\pi}{6} = \frac{2}{\sqrt{3}}$

The diagram shows four coordinate planes illustrating these evaluations:

- A right triangle in the fourth quadrant with hypotenuse 2, angle 30 degrees, and adjacent side sqrt(3). The angle 11pi/6 is indicated.
- A point (-1, 0) on the negative x-axis, representing the sine of 329pi.
- A point (0, -1) on the negative y-axis, representing the tangent of 7pi/2.
- A right triangle in the second quadrant with hypotenuse 2, angle 30 degrees, and adjacent side sqrt(3). The angle 5pi/6 is indicated.