

Today's Plan:

Learning Target (standard): I will describe common angles and I will evaluate the trigonometric values of common angles.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

p.392 #2-10 even, 32-46 even

$$2) \sin \theta = -\frac{12}{13} \quad \csc \theta = -\frac{13}{12}$$

$$\cos \theta = \frac{5}{13} \quad \sec \theta = \frac{13}{5}$$

$$\tan \theta = -\frac{12}{5} \quad \cot \theta = -\frac{5}{12}$$

$$4) \sin \theta = -\frac{2\sqrt{5}}{5} \quad \csc \theta = -\frac{\sqrt{5}}{2}$$

$$\cos \theta = -\frac{\sqrt{5}}{5} \quad \sec \theta = -\sqrt{5}$$

$$\tan \theta = 2 \quad \cot \theta = \frac{1}{2}$$

$$6) \sin \theta = -\frac{\sqrt{2}}{2} \quad \csc \theta = -\sqrt{2}$$

$$\cos \theta = \frac{\sqrt{2}}{2} \quad \sec \theta = -\sqrt{2}$$

$$\tan \theta = -1 \quad \cot \theta = -1$$

$$8) \sin \theta = \frac{\sqrt{2}}{2} \quad \csc \theta = \sqrt{2}$$

$$\cos \theta = \frac{\sqrt{2}}{2} \quad \sec \theta = \sqrt{2}$$

$$\tan \theta = 1 \quad \cot \theta = 1$$

$$10) \sin \theta = -\frac{4}{5} \quad \csc \theta = -\frac{5}{4}$$

$$\cos \theta = -\frac{3}{5} \quad \sec \theta = -\frac{5}{3}$$

$$\tan \theta = \frac{4}{3} \quad \cot \theta = \frac{3}{4}$$

p.392 #2-10 even, 32-46 even

32) $\sin \frac{3\pi}{4} = \frac{\sqrt{2}}{2}$ $\csc \frac{3\pi}{4} = \sqrt{2}$

$\cos \frac{3\pi}{4} = -\frac{\sqrt{2}}{2}$ $\sec \frac{3\pi}{4} = -\sqrt{2}$

$\tan \frac{3\pi}{4} = -1$ $\cot \frac{3\pi}{4} = -1$

34) $\sin 330^\circ = -\frac{1}{2}$ $\csc 330^\circ = -2$

$\cos 330^\circ = \frac{\sqrt{3}}{2}$ $\sec 330^\circ = \frac{2\sqrt{3}}{3}$

$\tan 330^\circ = -\frac{\sqrt{3}}{3}$ $\cot 330^\circ = -\sqrt{3}$

36) $\sin\left(-\frac{\pi}{3}\right) = -\frac{\sqrt{3}}{2}$ $\csc\left(-\frac{\pi}{3}\right) = -\frac{2\sqrt{3}}{3}$

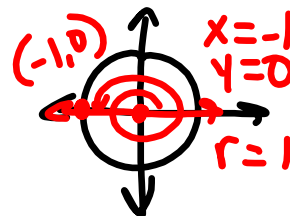
$\cos\left(-\frac{\pi}{3}\right) = \frac{1}{2}$ $\sec\left(-\frac{\pi}{3}\right) = 2$

$\tan\left(-\frac{\pi}{3}\right) = -\sqrt{3}$ $\cot\left(-\frac{\pi}{3}\right) = -\frac{\sqrt{3}}{3}$

38) $\sin 210^\circ = -\frac{1}{2}$ $\csc 210^\circ = -2$

$\cos 210^\circ = -\frac{\sqrt{3}}{2}$ $\sec 210^\circ = -\frac{2\sqrt{3}}{3}$

$\tan 210^\circ = \frac{\sqrt{3}}{3}$ $\cot 210^\circ = \sqrt{3}$



40) $\sin 3\pi = 0$ $\csc 3\pi = \text{und}$

$\cos 3\pi = -1$ $\sec 3\pi = -1$

$\tan 3\pi = 0$ $\cot 3\pi = \text{und}$

p.392 #2-10 even, 32-46 even

42) $\sin(-270^\circ) = 1$ $\csc(-270^\circ) = 1$

$\cos(-270^\circ) = 0$ $\sec(-270^\circ) = \text{und}$

$\tan(-270^\circ) = \text{und}$ $\cot(-270^\circ) = 0$

46) $\sin(-90^\circ) = -1$ $\csc(-90^\circ) = -1$

$\cos(-90^\circ) = 0$ $\sec(-90^\circ) = \text{und}$

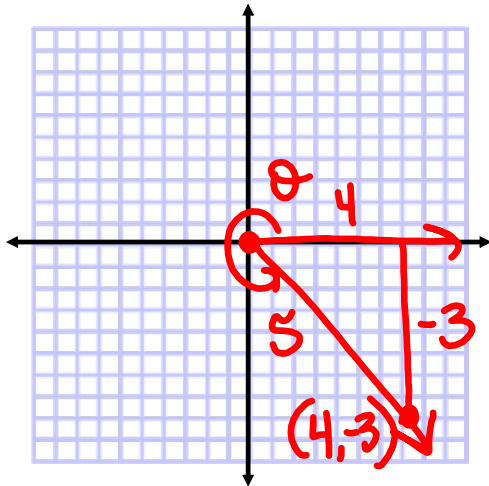
$\tan(-90^\circ) = \text{und}$ $\cot(-90^\circ) = 0$

44) $\sin(-\pi) = 0$ $\csc(-\pi) = \text{und}$

$\cos(-\pi) = -1$ $\sec(-\pi) = -1$

$\tan(-\pi) = 0$ $\cot(-\pi) = \text{und}$

Find the trigonometric values of θ when the terminal side of θ passes through $(4,-3)$.



$$\sin \theta = -\frac{3}{5}$$

$$\csc \theta = -\frac{5}{3}$$

$$\cos \theta = \frac{4}{5}$$

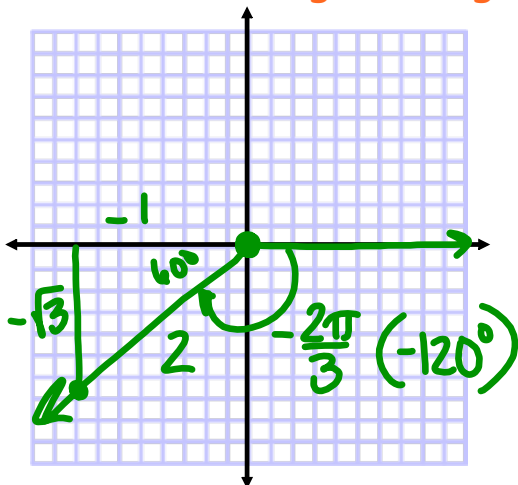
$$\sec \theta = \frac{5}{4}$$

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

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

Trigonometric Values of Common Angles:

* if the angle is negative, put it in parentheses *



$$\sin\left(-\frac{2\pi}{3}\right) = -\frac{\sqrt{3}}{2}$$

$$\csc\left(-\frac{2\pi}{3}\right) = -\frac{2\sqrt{3}}{3}$$

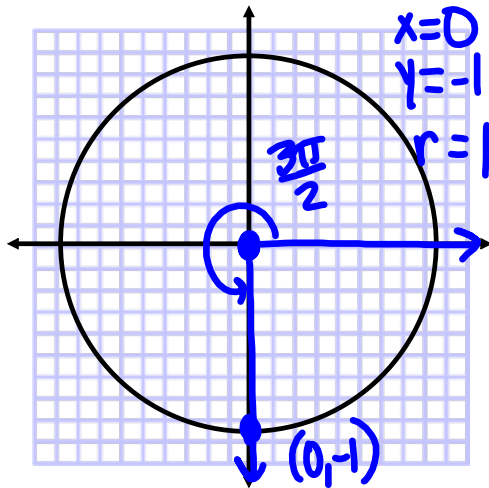
$$\cos\left(-\frac{2\pi}{3}\right) = -\frac{1}{2}$$

$$\sec\left(-\frac{2\pi}{3}\right) = -2$$

$$\tan\left(-\frac{2\pi}{3}\right) = \sqrt{3}$$

$$\cot\left(-\frac{2\pi}{3}\right) = \frac{\sqrt{3}}{3}$$

Trigonometric Values of Common Angles:



$$\sin \frac{3\pi}{2} = -1$$

$$\csc \frac{3\pi}{2} = -1$$

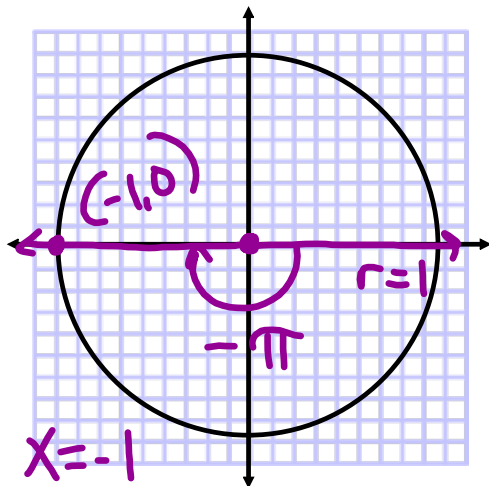
$$\cos \frac{3\pi}{2} = 0$$

$$\sec \frac{3\pi}{2} = -$$

$$\tan \frac{3\pi}{2} = -$$

$$\cot \frac{3\pi}{2} = 0$$

Trigonometric Values of Common Angles: $-\pi \cdot \frac{180^\circ}{\pi} = -180^\circ$



$$\sin(-\pi) = 0$$

$$\csc(-\pi) = -$$

$$\cos(-\pi) = -1$$

$$\sec(-\pi) = -1$$

$$\tan(-\pi) = 0$$

$$\cot(-\pi) = -$$

$x = -1$
 $y = 0$
 $r = 1$

↑
 * if θ is negative, put it in parentheses.

Simplify.

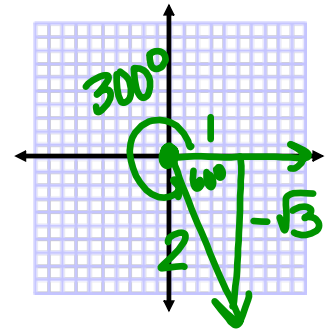
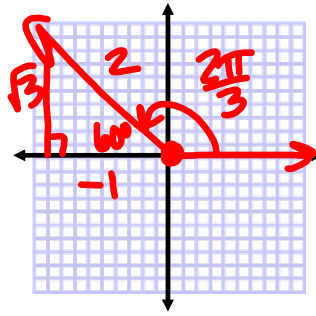
* When evaluating trig expressions with common angles, you must have a diagram for each angle *

$$\tan \frac{2\pi}{3} + \csc 300^\circ$$

$$= -\sqrt{3} - \frac{2\sqrt{3}}{3}$$

$$= -\frac{3\sqrt{3}}{3} - \frac{2\sqrt{3}}{3}$$

$$= -\frac{5\sqrt{3}}{3}$$



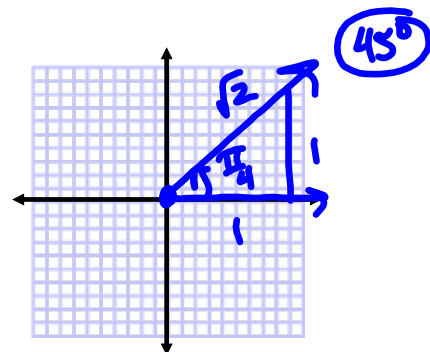
Simplify.

$$\sin^2\left(\frac{\pi}{4}\right) + \cos^2\left(\frac{\pi}{4}\right)$$

$$= \left(\frac{\sqrt{2}}{2}\right)^2 + \left(\frac{\sqrt{2}}{2}\right)^2$$

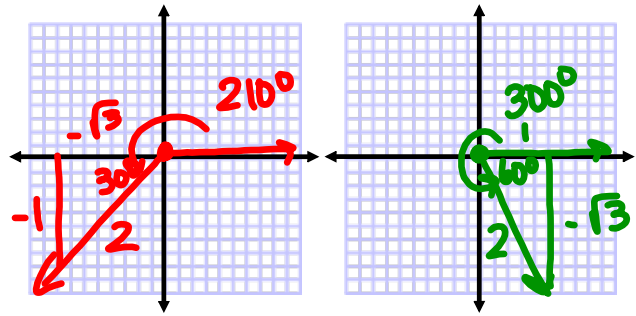
$$= \frac{2}{4} + \frac{2}{4}$$

$$= 1$$



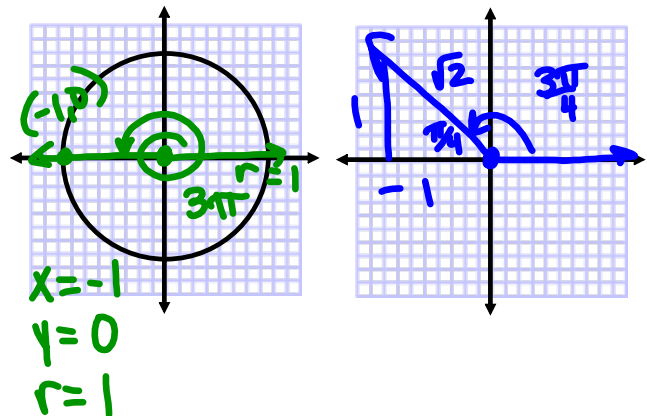
Simplify.

$$\begin{aligned}
 & 2\sec 210^\circ - \cot^2 300^\circ \\
 &= 2\left(-\frac{2\sqrt{3}}{3}\right) - \left(-\frac{\sqrt{3}}{3}\right)^2 \\
 &= -\frac{4\sqrt{3}}{3} - \frac{1}{3} \\
 &= \frac{-4\sqrt{3}-1}{3}
 \end{aligned}$$



Simplify.

$$\begin{aligned}
 & \sin^3(3\pi) - 2\csc\left(\frac{3\pi}{4}\right) \\
 &= (0)^3 - 2(\sqrt{2}) \\
 &= -2\sqrt{2}
 \end{aligned}$$



Non-Common Angles:

- trigonometric angles that do NOT result in a special right triangle or a quadrantal angle
- trigonometric values of non-common angles will be **approximations** found with a calculator
- calculators do not have buttons for the cosecant, secant, and cotangent functions
 - these are found through their **reciprocal** relationships
- the form of the angle dictates the **mode** of the calculator

$$\sin 15^\circ = 0.259$$

$$\csc 15^\circ = \frac{1}{\sin 15^\circ} = 3.864$$

"radian"
mode

$$\cos \frac{\pi}{12} = 0.966$$

$$\sec \frac{\pi}{12} = \frac{1}{\cos \frac{\pi}{12}} = 1.035$$

Assignment:

p.392 #12-30 even

* Draw and label ALL diagrams *

p.392 #48-80 even

* Use calculator and approximate answer to 3 decimal places *