

Section 4.7

Evaluate Inverse Trig Functions

Objective:

Given the value of a trig function students will be able to find the corresponding angle for the trigonometric function.

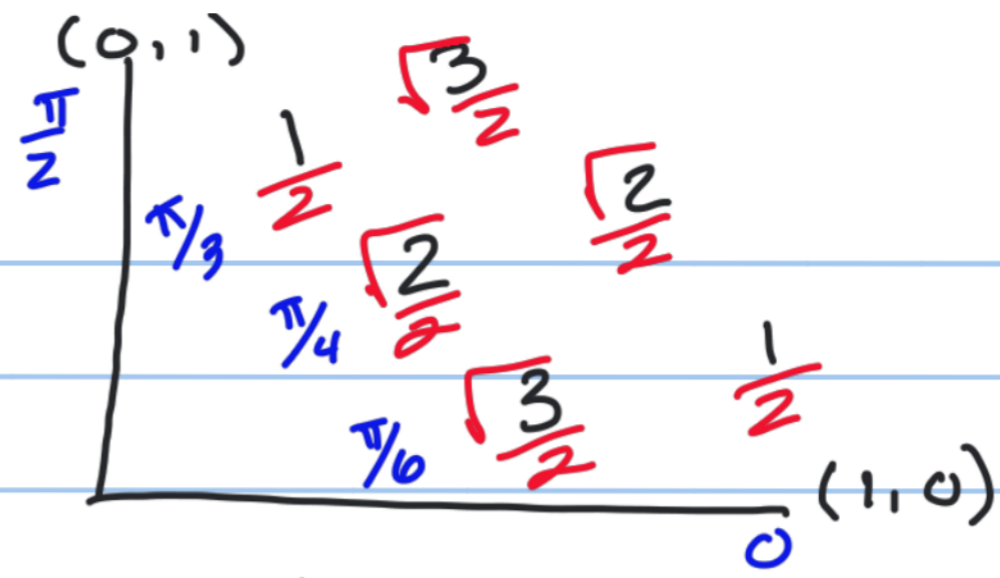
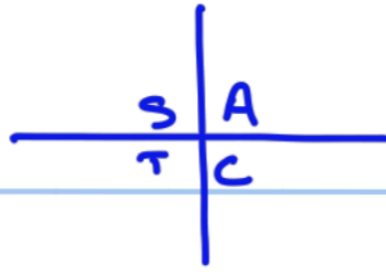
Study Problems

Page 351 #4-7,9-15 odd *(Do not use Calculator),*

17-23 odd *(Use Calculator)*

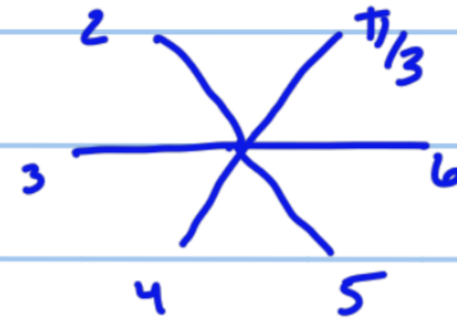
Example

Find the value of x .



a. $\sin x = \frac{1}{2}$

b. $\cos x = 0$



c. $\tan x = \sqrt{3}$

$\tan x = \frac{y}{x} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{\sqrt{3}}{2} \cdot \frac{2}{1} = \sqrt{3}$
 $= \frac{\pi}{3}$

$x = \frac{\pi}{6} + 2\pi k$ } where k is an integer
OR $x = \frac{5\pi}{6} + 2\pi k$ }

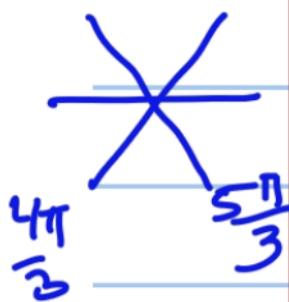
$x = \frac{\pi}{2} + 2\pi k$
OR
 $x = \frac{3\pi}{2} + 2\pi k$

$x = \frac{\pi}{3} + \pi k$ } where $k \in \mathbb{Z}$
? $x = \frac{4\pi}{3} + \pi k$ }

where $k \in \mathbb{Z}$

Example

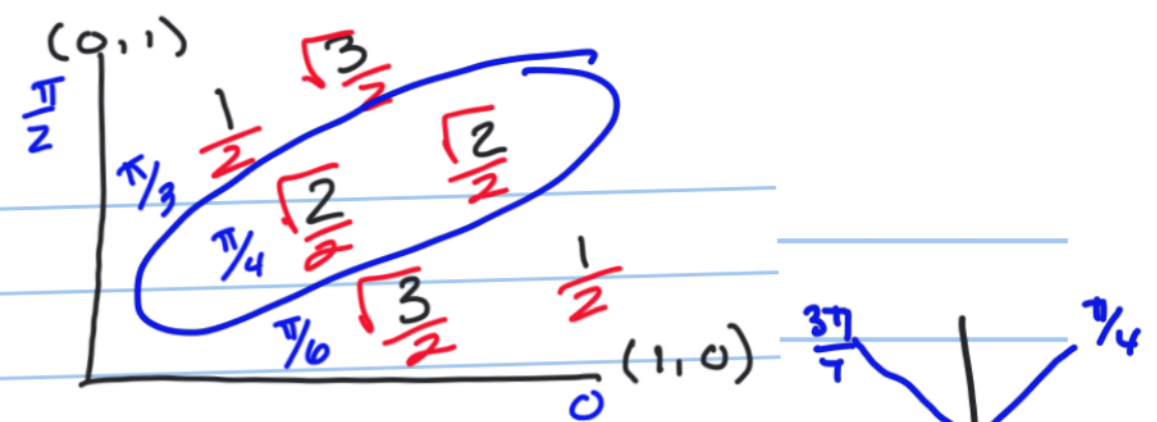
Find the value of x.



$$a. \sin x = -\frac{\sqrt{3}}{2}$$

$$b. \cos x = -\frac{1}{2}$$

$$c. \tan x = -1$$



$$x = \frac{4\pi}{3} + 2\pi k$$

$$x = \frac{2\pi}{3} + 2\pi k$$

$$x = \frac{3\pi}{4} + \pi k$$

$$k \in \mathbb{Z}$$

$$x = \frac{5\pi}{3} + 2\pi k$$

$$x = \frac{4\pi}{3} + 2\pi k$$

$$x = \frac{7\pi}{4} + \pi k$$

where $k \in \mathbb{Z}$

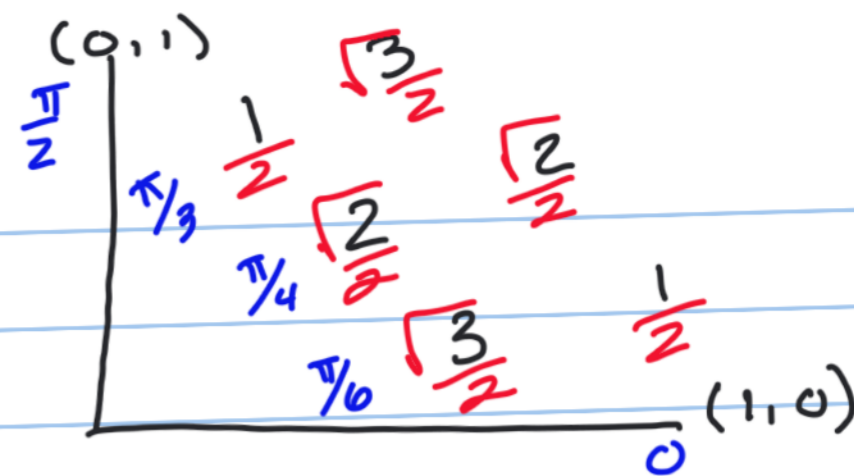
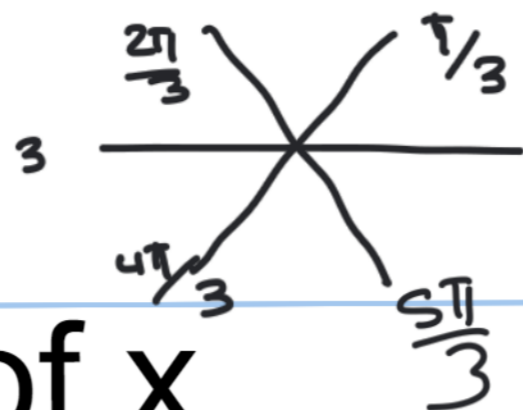
where $k \in \mathbb{Z}$

$$\begin{aligned} \tan \frac{3\pi}{4} &= \frac{\sin \frac{\pi}{4}}{\cos \frac{\pi}{4}} \\ &= \frac{\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} \end{aligned}$$

$$\frac{\sqrt{2}}{2} \cdot -\frac{2}{\sqrt{2}} = -1$$

Example

Find the value of x .



$$a. \csc x = \frac{1}{\sin x} = \frac{2\sqrt{3}}{3}$$

$$b. \cot x = \frac{\cos x}{\sin x} = -\frac{\sqrt{3}}{3}$$

$$c. \sec x = -2$$

$$x = \frac{\pi}{3} + 2\pi k$$

$$x = \frac{2\pi}{3} + \pi k$$

$$x = \frac{2\pi}{3} + 2\pi k$$

$$x = \frac{5\pi}{3} + \pi k$$

where $k \in \mathbb{Z}$

where $k \in \mathbb{Z}$