

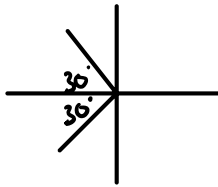
## Homework 9.6

Solve each of the following trigonometric equations finding two values for  $\theta$  if  $0^\circ < \theta \leq 360^\circ$ . Solve these equations WITHOUT the aid of a calculator. Show your work including your graphical analysis.

1.  $\cos \theta = -\frac{\sqrt{3}}{2}$   
*QUAD II, III*

$$\theta = \cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$$

$$\therefore \theta' = 30^\circ$$

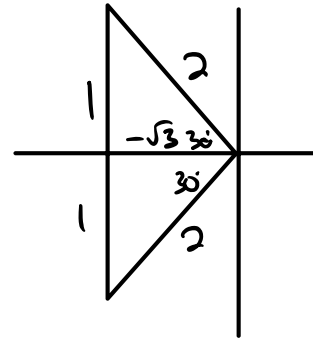


$$\theta = 180^\circ - 30^\circ = 150^\circ$$

$$\theta = 180^\circ + 30^\circ = 210^\circ$$

Alternate Method

$$\cos \theta = -\frac{\sqrt{3}}{2} = \frac{x}{r}$$



$$\theta = 180^\circ - 30^\circ = 150^\circ$$

$$\theta = 180^\circ + 30^\circ = 210^\circ$$

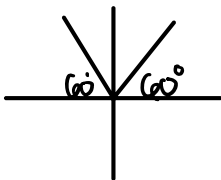
2.  $\csc \theta = \frac{2\sqrt{3}}{3}$

*QUAD I, II*

$$\sin \theta = \frac{3}{2\sqrt{3}} = \frac{3\sqrt{3}}{2 \cdot 3} = \frac{\sqrt{3}}{2}$$

$$\theta = \sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$$

$$\therefore \theta' = 60^\circ$$

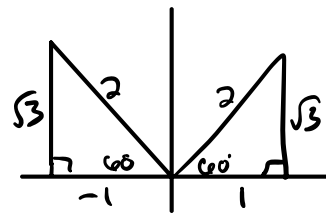


$$\theta = 60^\circ$$

$$\theta = 180^\circ - 60^\circ = 120^\circ$$

Alternate Method

$$\sin \theta = \frac{\sqrt{3}}{2} = \frac{y}{r}$$



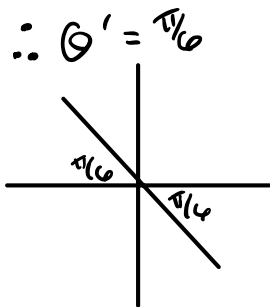
$$\theta = 60^\circ$$

$$\theta = 180^\circ - 60^\circ = 120^\circ$$

Solve each of the following trigonometric equations finding two values for  $\theta$  if  $0 < \theta \leq 2\pi$ . Solve these equations WITHOUT the aid of a calculator. Show your work including your graphical analysis.

3.  $\cot \theta = -\sqrt{3}$

*QUAD II, IV*  
 $\tan \theta = \frac{1}{-\sqrt{3}} = -\frac{\sqrt{3}}{3}$   
 $\theta = \tan^{-1}\left(-\frac{\sqrt{3}}{3}\right)$

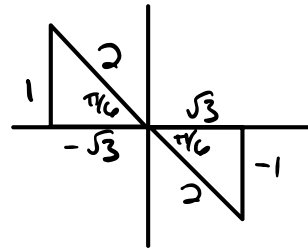


$$\theta = \pi - \frac{\pi}{6} = \frac{5\pi}{6}$$

$$\theta = 2\pi - \frac{\pi}{6} = \frac{11\pi}{6}$$

Alternate Method

$$\cot \theta = -\frac{\sqrt{3}}{1} = \frac{x}{y}$$

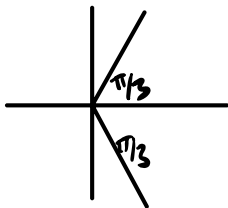


$$\theta = \pi - \frac{\pi}{6} = \frac{5\pi}{6}$$

$$\theta = 2\pi - \frac{\pi}{6} = \frac{11\pi}{6}$$

4.  $\sec \theta = 2$

*QUAD I, IV*  
 $\cos \theta = \frac{1}{2}$   
 $\theta = \cos^{-1}\left(\frac{1}{2}\right)$   
 $\therefore \theta' = \frac{\pi}{3}$

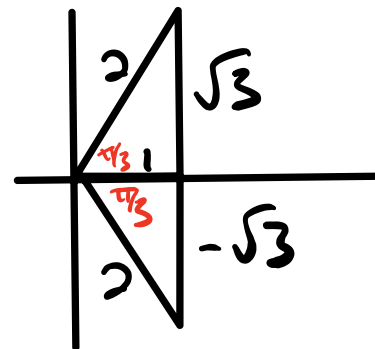


$$\theta = \frac{\pi}{3}$$

$$\theta = 2\pi - \frac{\pi}{3} = \frac{5\pi}{3}$$

Alternate Method

$$\sec \theta = \frac{r}{x} = \frac{2}{1}$$



$$\theta = \frac{\pi}{3}$$

$$\theta = 2\pi - \frac{\pi}{3} = \frac{5\pi}{3}$$

Solve each of the following trigonometric equations finding two values for  $\theta$  if  $0^\circ < \theta \leq 360^\circ$ . Give your answers to the nearest thousandth of a degree. Show your work including your graphical analysis.

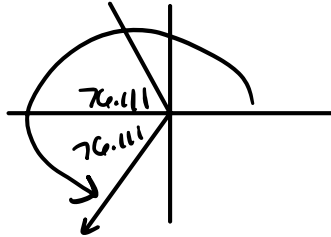
5.  $\cos \theta = -0.2419$

QUAD II, III

$$\theta = \cos^{-1}(-0.2419)$$

$$\theta = 103.999^\circ$$

$$\therefore \theta' \approx 76.001^\circ$$



$$\theta = 103.999^\circ$$

$$\theta = 180^\circ + 76.001^\circ = 256.001^\circ$$

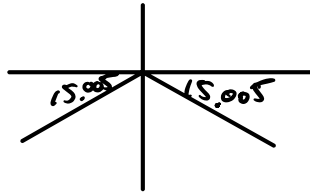
6.  $\sin \theta = -0.2589$

QUAD III, IV

$$\theta = \sin^{-1}(-0.2589)$$

$$\theta \approx -15.005^\circ$$

$$\therefore \theta' = 15.005$$



$$\theta \approx 180^\circ + 15.005 = 195.005^\circ$$

$$\theta = 360^\circ - 15.005^\circ = 344.995^\circ$$

Solve each of the following trigonometric equations finding two values for  $\theta$  if  $0 < \theta \leq 2\pi$ . Give your answers to the nearest thousandth of a radian. Show your work including your graphical analysis.

7.  $\cot \theta = -1.280$

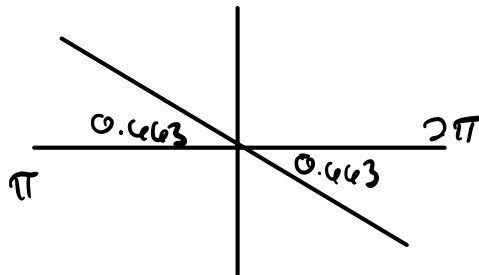
QUAD II, IV

$$\therefore \theta' \approx 0.663$$

$$\tan \theta = \frac{1}{-1.280}$$

$$\theta = \tan^{-1}\left(\frac{1}{-1.280}\right)$$

$$\theta = -0.663$$



$$\theta = \pi - 0.663 = 2.479$$

$$\theta = 2\pi - 0.663 = 5.620$$

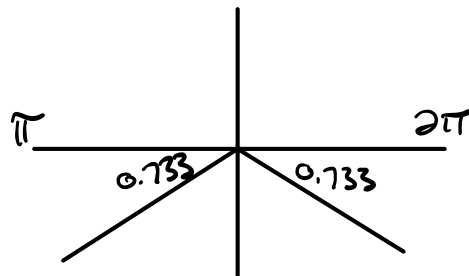
8.  $\sin \theta = -0.6691$

QUAD III, IV

$$\therefore \theta' = 0.733$$

$$\theta = \sin^{-1}(-0.6691)$$

$$\theta = -0.733$$



$$\theta = \pi + 0.733 = 3.875$$

$$\theta = 2\pi - 0.733 = 5.550$$