

## Homework 03-20

$$(2) \quad 4(\csc \theta + 2) = \csc \theta + 14$$

$$\text{let } x = \csc \theta$$

$$4(x + 2) = x + 14$$

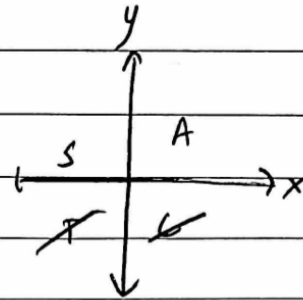
$$4x + 8 = x + 14$$

$$3x = 6$$

$$x = 2$$

$$\csc \theta = 2$$

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



$$\text{QI } \theta = 30^\circ$$

$$\text{QII } \theta = 180^\circ - 30^\circ = 150^\circ$$

$$(4) \quad 2 \cos \theta + 5\sqrt{3} = 4\sqrt{3}$$

$$\text{let } x = \cos \theta$$

$$2x + 5\sqrt{3} = 4\sqrt{3}$$

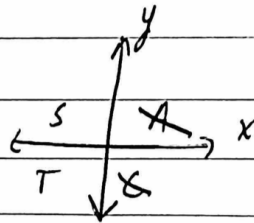
$$2x = -\sqrt{3}$$

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

$$2$$

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

$$2$$



$\cos \theta$  is  $\ominus$  in Quadrants II, III

$$\text{QII } \theta = 180^\circ - 30^\circ = 150^\circ$$

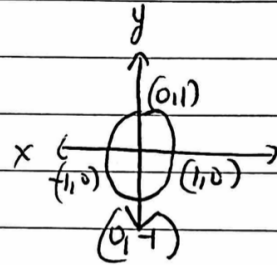
$$\text{QIII } \theta = 180^\circ + 30^\circ = 210^\circ$$

Remember to find ref  $\theta$  ignore the  $\ominus$   
ref  $\theta$ :  $30^\circ$

$$\{150^\circ, 210^\circ\}$$

$$\begin{aligned} \textcircled{6} \quad 3 \sin \theta - 1 &= 2 \\ 3 \sin \theta &= 3 \\ \sin \theta &= 1 \end{aligned}$$

Remember when  $\sin$  or  $\cos = \pm 1, 0$   
 $\theta$  is a quadrantal  $\&$  so go to  
 your unit circle.



$$\theta = 90^\circ$$

$$\textcircled{8} \quad 3 \sec \theta = \frac{2}{3}(3 \sec \theta - 3)$$

$$\text{let } x = \sec \theta$$

$$3x = \frac{2}{3}(3x - 3)$$

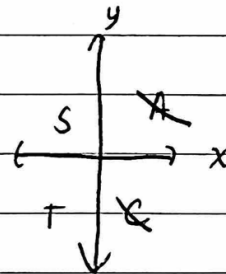
$$3x = 2x - 2$$

$$x = -2$$

$$\sec \theta = -2$$

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

$$\text{ref } \angle: \quad = 60^\circ$$



$$\text{QII: } \theta = 180^\circ - 60^\circ = 120^\circ$$

$$\text{QIII: } \theta = 180^\circ + 60^\circ = 240^\circ$$

$$\left\{ \frac{2\pi}{3}, \frac{4\pi}{3} \right\}$$

$$\textcircled{10} \quad 6 \cos \theta + \sqrt{3} = -4(\cos \theta + \sqrt{3})$$

$$\text{let } x = \cos \theta$$

$$6x + \sqrt{3} = -4(x + \sqrt{3})$$

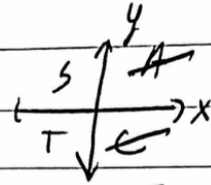
$$6x + \sqrt{3} = -4x - 4\sqrt{3}$$

$$10x = -5\sqrt{3}$$

$$x = \frac{-5\sqrt{3}}{10} = -\frac{\sqrt{3}}{2}$$

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

$$\text{ref } \angle: 30^\circ$$



$\cos \theta$  is  $\ominus$  in QII, & QIII

$$\text{QII } \theta = 180^\circ - 30^\circ = 150^\circ$$

$$\text{QIII } \theta = 180^\circ + 30^\circ = 210^\circ$$

Remember to convert to radians here b/c of the interval given in question.

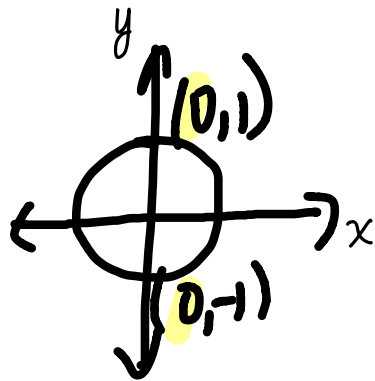
$$\left\{ \frac{5\pi}{6}, \frac{7\pi}{6} \right\}$$

$$\textcircled{12} \quad 4 \cos \theta + 3 = 3$$

$$4 \cos \theta = 0$$

$$\cos \theta = 0$$

$$\theta = 90^\circ, 270^\circ$$



$$\left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\}$$