

Day 79

14.2 Solving Trig Eqs. Using Inverses.

①
$$\frac{4 \cos \theta - 1}{-1 \cos \theta} = \frac{\cos \theta}{-\cos \theta}$$

For $0 \leq \theta < 2\pi$

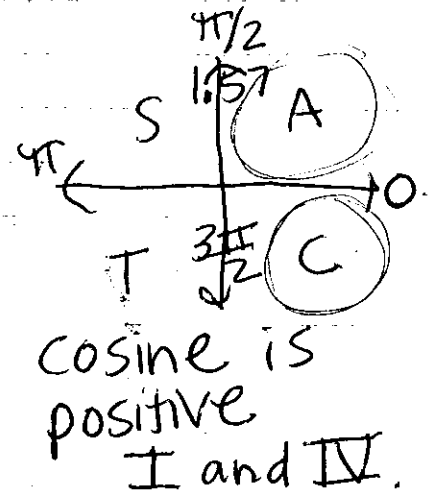
$$\frac{3 \cos \theta - 1}{+1} = \frac{0}{+1}$$

$$\frac{3}{3} \cos \theta = \frac{1}{3}$$

$$\cos \theta = \frac{1}{3} \quad \leftarrow \text{inverse}$$

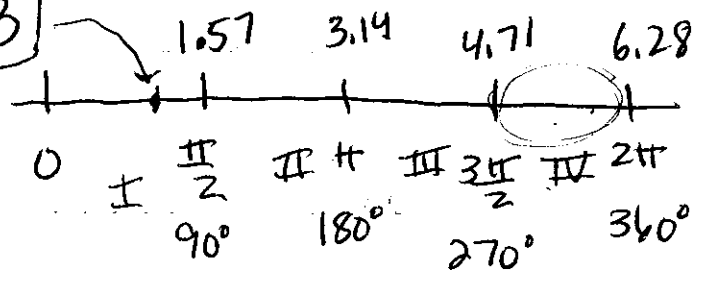
$$\theta = \cos^{-1}\left(\frac{1}{3}\right)$$

$$\theta \approx 1.23$$



another would be at $2\pi - 1.23$

$$\theta \approx 5.05$$



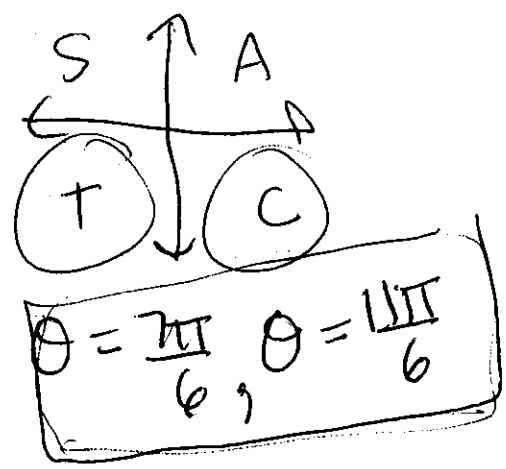
②
$$\frac{3 \sin \theta + 1}{-\sin \theta} = \frac{\sin \theta}{-\sin \theta} \quad \text{for } 0 \leq \theta < 2\pi$$

$$\frac{2 \sin \theta + 1}{-1} = \frac{0}{-1}$$

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

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

$$\theta = \sin^{-1}\left(-\frac{1}{2}\right) = -.524$$



$0, \frac{1}{2}, \frac{\sqrt{2}}{2}, \frac{\sqrt{3}}{2}, 1$ (refer to chart)

③ Solve $2 \cos \theta \sin \theta + \sin \theta = 0$

for $0 \leq \theta < 2\pi$

Factor the GCF

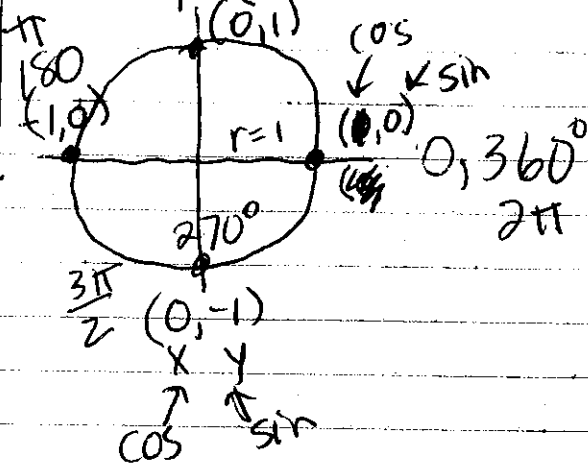
$$\sin \theta (2 \cos \theta + 1) = 0$$

Set each Factor = to zero and solve

$$\sin \theta = 0$$

$90^\circ (\pi/2)$

$(0, 1)$



$$2 \cos \theta + 1 = 0$$

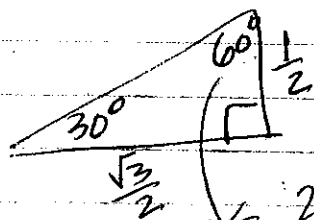
$-1 \quad -1$

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

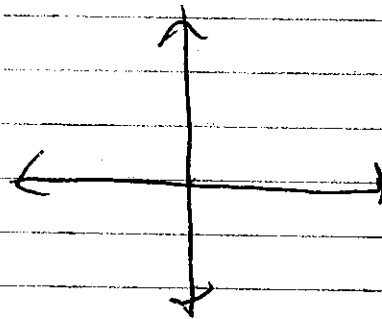
$$\cos \theta = -\frac{1}{2}$$

$$\theta = \frac{2\pi}{3}, \frac{4\pi}{3}$$

$$\theta = 0, \pi$$



$\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$
 $\frac{1}{2}, \frac{\sqrt{3}}{2}, -\frac{1}{2}, -\frac{\sqrt{3}}{2}$



Solve.

$$\frac{\sin\theta \cos\theta}{\cos\theta} - \frac{\cos\theta}{\cos\theta} = 0 \text{ for } 0 \leq \theta < 2\pi$$

$$\cos\theta (\sin\theta - 1) = 0$$

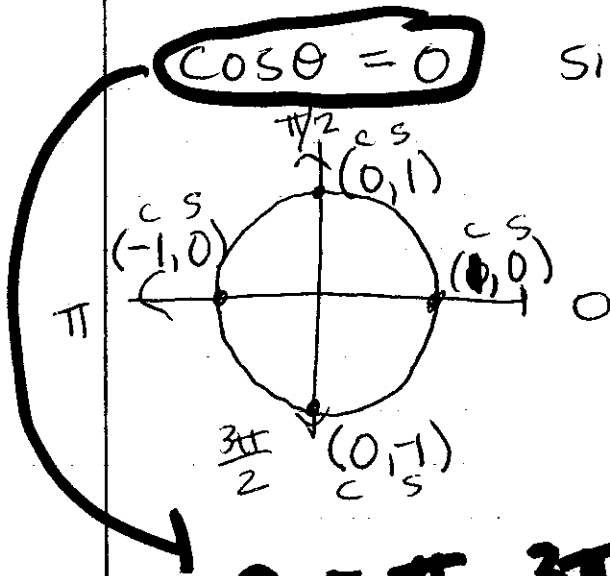
$$\cos\theta = 0$$

$$\sin\theta - 1 = 0$$

$$+1 \quad +1$$

$$\sin\theta = 1$$

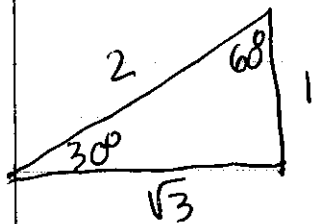
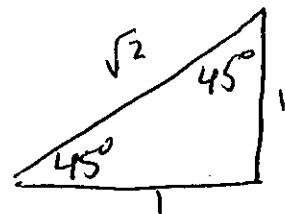
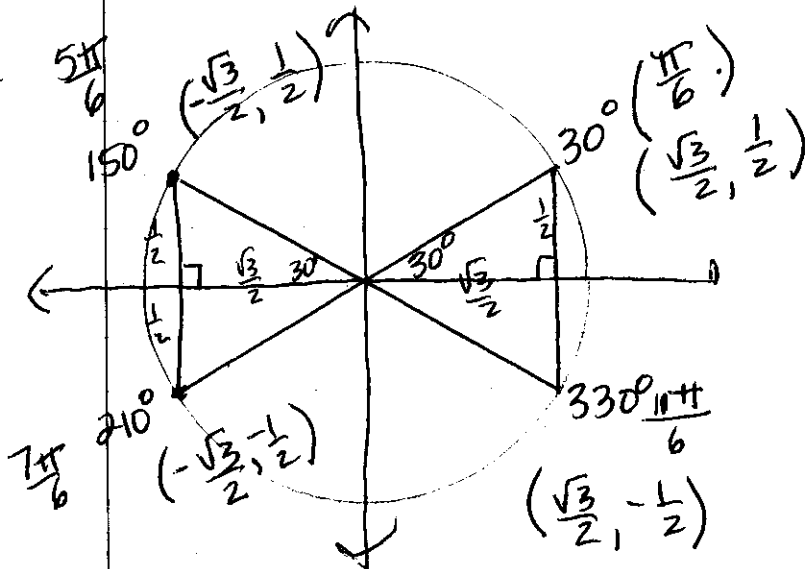
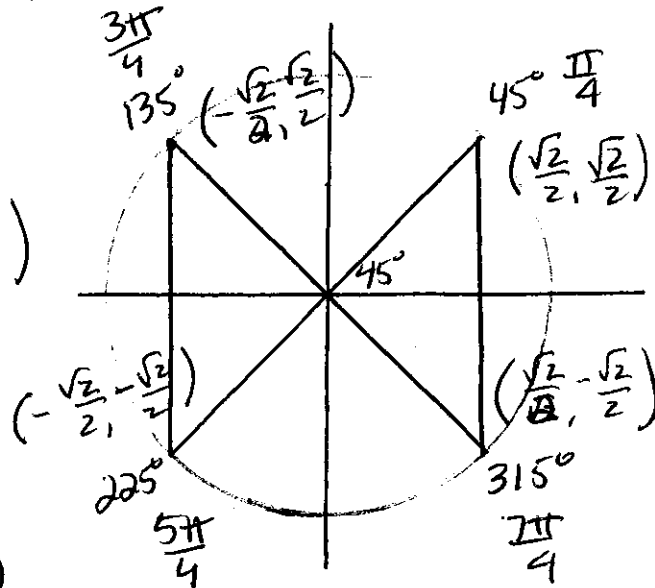
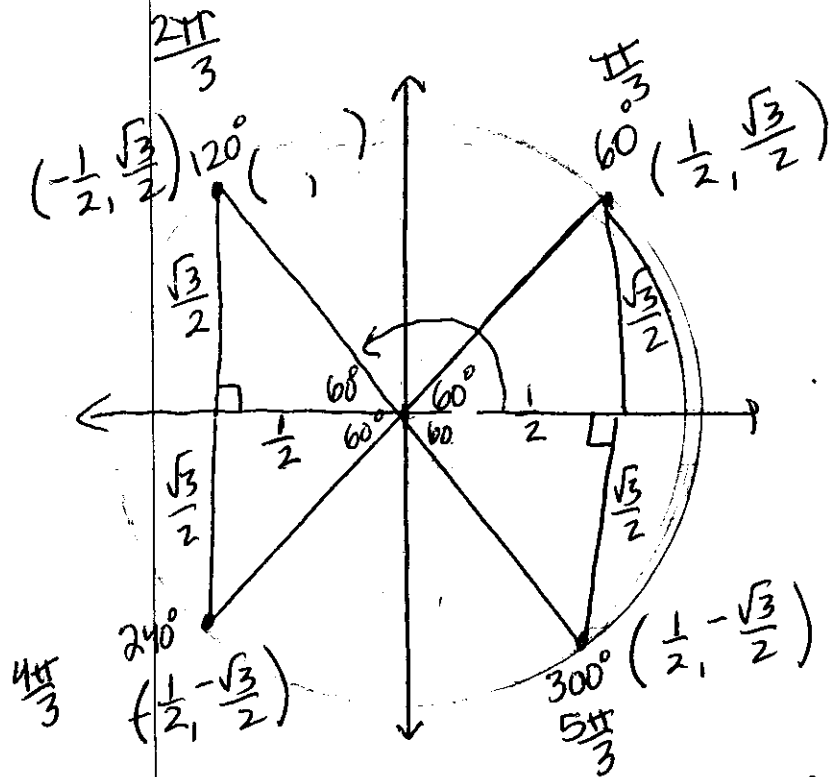
$$\theta = \frac{\pi}{2}$$



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

$$\theta = \frac{\pi}{2}, \frac{3\pi}{2}$$

p. 787 (16-21, 26-30)



\tan undefined
 90° 270°

$$\tan 180^\circ = 0$$

$$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\tan 60^\circ = \frac{\sqrt{3}}{1} = \sqrt{3}$$

$$\tan 0^\circ = 0$$

$$\tan 45^\circ = 1$$