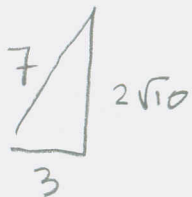


1. Find the value of sine, cosine and tangent for the angle  $\theta$ , if  $\sec\theta = \frac{7}{3}$  and  $0 \leq \theta \leq \pi$



$$\sin\theta = \frac{2\sqrt{10}}{7}$$

$$\cos\theta = \frac{3}{7}$$

$$\tan\theta = \frac{2\sqrt{10}}{3}$$

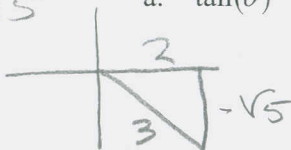
$49 - 9 = 40 \rightarrow \sqrt{40} = 2\sqrt{10}$

2. Suppose  $\cos(\theta) = \frac{2}{3}$  and  $\pi < \theta < 2\pi$ . Find the following:

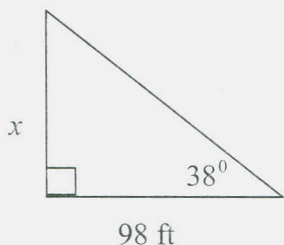
$9 - 4 = 5$   
 $\sqrt{5}$

a.  $\tan(\theta) = -\frac{\sqrt{5}}{2}$

b.  $\sin(\theta) = -\frac{\sqrt{5}}{3}$



3. Solve for  $x$ :



$$\frac{x}{98} = \tan 38^\circ$$

$$x = 98 \tan 38^\circ \approx (7812856265)98 \approx 76.566 \text{ ft}$$

$\theta'$  See pg 1166

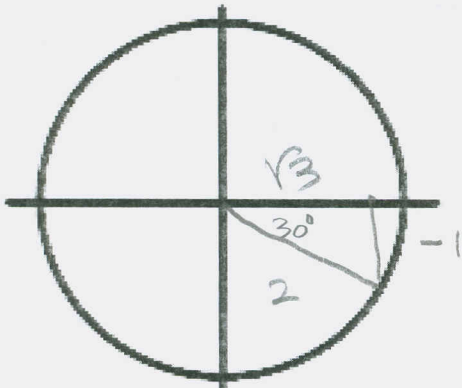
4. Find the reference angle,  $\theta'$ , sketch  $\theta$  and  $\theta'$  in standard position, then evaluate  $\sin(\theta)$ ,  $\cos(\theta)$ , and  $\tan(\theta)$ . You shouldn't need a calculator.

a.  $\theta = 330^\circ$

$\theta' = 30^\circ$

b.  $\theta = \frac{7\pi}{3}$

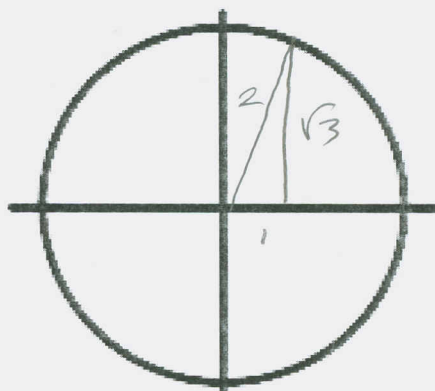
$\theta' = \frac{\pi}{3}$



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

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

$$\tan\theta = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$$



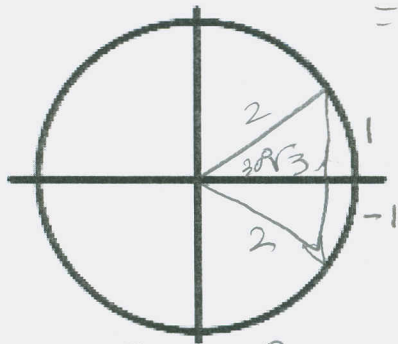
$$\sin\theta = \frac{\sqrt{3}}{2}$$

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

$$\tan\theta = \sqrt{3}$$

5. Find two different solutions for each. Give your answers in degrees ( $0 \leq \theta < 360^\circ$ ) and radians ( $0 \leq \theta < 2\pi$ )

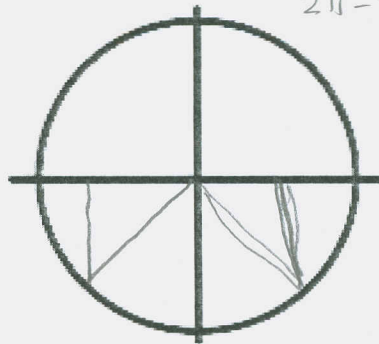
a.  $\cos(\theta) = \frac{\sqrt{3}}{2}$



$\theta = 30^\circ, 330^\circ$   
 $\frac{\pi}{6}, \frac{11\pi}{6}$

$2\pi - \frac{\pi}{6}$   
 $= \frac{(2-1)\pi}{6}$   
 $= \frac{11\pi}{6}$

b.  $\sin(\theta) = -\frac{1}{\sqrt{2}}$



$\frac{5\pi}{4}, \frac{7\pi}{4}$   
 $225^\circ, 315^\circ$

$2\pi - \frac{\pi}{4} = \frac{8\pi - \pi}{4}$   
 $= \frac{7\pi}{4}$   
 $\pi + \frac{\pi}{4} =$   
 $\frac{5\pi}{4}$   
 $180 + 45 =$   
 $225$   
 $360 - 45 =$   
 $315$

6. Bonus Write the formula for a cosine function, whose high point occurs at  $\theta = 27$ , amplitude is 33, period is 24, and whose lowest y-value is 110.

$33 \cos\left(\frac{\pi}{12}(x - 27)\right) + 143$

~~$110 + 2(33) = 110$~~

$110 + 33 = \text{mid pt} = 143$

$\frac{2\pi}{b} = \text{Period} = 24$

$24b = 2\pi$

$b = \frac{\pi}{12}$