

PRE-AP ALGEBRA 2

- 1) An angle  $\theta$  in Quadrant II has  $\sin \theta = \frac{9}{41}$ .  
Find  $\cos \theta$  and  $\tan \theta$ .

$$\cos^2 \theta + \sin^2 \theta = 1, \quad \cos^2 \theta = 1 - \sin^2 \theta,$$

$$\cos^2 \theta = 1 - \left(\frac{9}{41}\right)^2 = \frac{1600}{1681}$$

$$Q II \Rightarrow \cos \theta = -\sqrt{\frac{1600}{1681}} = -\frac{40}{41} \leftarrow$$

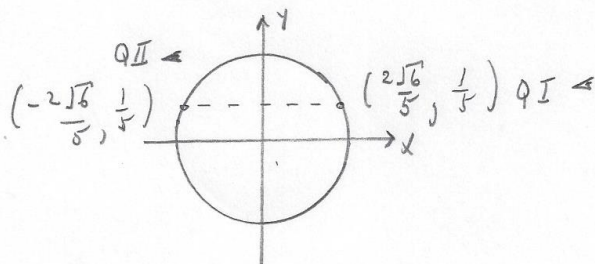
$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{\frac{9}{41}}{-\frac{40}{41}} = -\frac{9}{40} \leftarrow$$

- 2) Two points  $(x, y) = (x, \frac{1}{5})$  are on the unit circle. Find the two values of  $x$ . In which quadrants are the two points?

$$x^2 + y^2 = 1$$

$$x^2 + \left(\frac{1}{5}\right)^2 = 1, \quad x^2 = 1 - \left(\frac{1}{5}\right)^2 = \frac{24}{25},$$

$$x = \pm \sqrt{\frac{24}{25}} = \pm \frac{\sqrt{4}\sqrt{6}}{5} = \pm \frac{2\sqrt{6}}{5} \approx \pm 0.9798$$



4A.6 CLASSWORK

- 3) A point  $(x, y)$  is on a circle of radius 7 at an angle of  $\theta = \frac{11\pi}{6}$ . Find  $x$  and  $y$ .

$$\cos \theta = \frac{x}{r}, \quad x = r \cos \theta = 7 \cos \left(\frac{11\pi}{6}\right)$$

$$x = 7 \left(\frac{\sqrt{3}}{2}\right) = \frac{7\sqrt{3}}{2} \approx 6.0622 \leftarrow$$

$$\sin \theta = \frac{y}{r}, \quad y = r \sin \theta = 7 \sin \left(\frac{11\pi}{6}\right)$$

$$y = 7 \left(-\frac{1}{2}\right) = -\frac{7}{2} = -3\frac{1}{2} \leftarrow$$

- 4) For an angle  $\theta$  in Quadrant IV,  $\tan \theta = -\frac{35}{12}$ .  
Find  $\sin \theta$  and  $\cos \theta$ .

$$Q IV \Rightarrow x > 0 \text{ and } y < 0,$$

$$\tan \theta = \frac{-35}{12} = \frac{y}{x}, \quad x = 12, \quad y = -35$$

$$r = \sqrt{x^2 + y^2} = \sqrt{12^2 + (-35)^2} = 37$$

$$\sin \theta = \frac{y}{r} = \frac{-35}{37} \leftarrow$$

$$\cos \theta = \frac{x}{r} = \frac{12}{37} \leftarrow$$