

## Lesson 9 Using the Special Circle

Ex. 1) Determine the exact values of the following

unit circle  
 $(x, y) \rightarrow (\cos \theta, \sin \theta)$

a)  $\cos \frac{\pi}{3}$

$\frac{1}{2}$

b)  $\sec \frac{\pi}{4}$  reciprocal of  $\cos \frac{\pi}{4}$

$\frac{2}{\sqrt{2}}$   $(\frac{\sqrt{2}}{\sqrt{2}})$   $\frac{\sqrt{2}}{\cancel{2}}$   $\sqrt{2}$

c)  $\csc \left(-\frac{2\pi}{3}\right)$

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

d)  $\cot \frac{5\pi}{6}$   $\frac{x}{y}$   $-\frac{\sqrt{3}}{\cancel{2}}$

$-\sqrt{3}$

$\frac{1}{\cancel{2}}$

e)  $\cos \frac{29\pi}{6}$

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

f)  $\cos(30\pi) \cdot \sec \frac{2\pi}{3} \cdot \csc \frac{-\pi}{3}$

$1 (-2) \left(-\frac{2}{\sqrt{3}}\right)$

$\frac{4}{\sqrt{3}}$

## Pre-Calculus 11 Enriched Trigonometry

Ex. 2) State the values of  $\theta$  over the interval  $0 \leq \theta \leq 2\pi$ .

a)  $\cos\theta = \frac{1}{\sqrt{2}}$  ( $\frac{\sqrt{2}}{2}$ )

radians

so answers in radians

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

$$\theta = \frac{\pi}{4}, \frac{7\pi}{4}$$

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

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

$$\tan\theta < 0$$

Q II, IV

$$\theta = \frac{5\pi}{6}, \frac{11\pi}{6}$$

c)  $\sec\theta = -2$

reciprocal of  $\cos\theta$

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

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

$\cos\theta < 0$  in  
Q II, III

d)  $\csc\theta = 1$

reciprocal of  $\sin\theta$

$$\therefore \sin\theta = 1$$

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