November 2, 2010

Note Title 11/2/2010

§6.6 #94

$r = 2\text{mm}$, $\omega = 6\pi$ rad/sec $t = 11$ sec

Find s.

$\omega = \frac{\theta}{t}$ $\qquad r\theta = s$

$\theta = \omega t$

$= (6\pi)11$ rad $= 66\pi$ rad.

Hence $s = r\theta$

$= (2)\cdot 66\pi$ mm

$= 132\pi$ mm

#90] $\omega = \frac{3\pi}{4}$ rad/sec $\approx$ 3 Sig. digits

$r = 8$ cm

Find linear speed v.

$v = \frac{s}{t}$ $\omega = \frac{\theta}{t}$ $\boxed{v = r\omega}$

#84] $v = 5.6$ ft/sec

$t = 2$

Find s. $v = \frac{s}{t}$

Unit Circle

Example

$\sin\left(\frac{5\pi}{3}\right)$ The angle $\frac{5\pi}{3}$ corresponds to the point $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ on the unit circle.

The value of the sine function is the y cordinate $\therefore \sin\left(\frac{5\pi}{3}\right) = -\frac{\sqrt{3}}{2}$.

b) $\cos\left(\frac{7\pi}{6}\right)$

$\frac{7\pi}{6}$ corresponds to the point $\left(\frac{-\sqrt{3}}{2}, -\frac{1}{2}\right)$ on the unit circle

Value of cosine function is the x-coordinate

Hence $\cos\left(\frac{7\pi}{6}\right) = -\frac{\sqrt{3}}{2}$.

c) $\tan\left(\frac{7\pi}{4}\right) = \frac{-\sqrt{2}/2}{\sqrt{2}/2}$ $\quad$ pt $\left(\frac{\sqrt{2}}{2}, \frac{-\sqrt{2}}{2}\right)$

$= -1$

Example

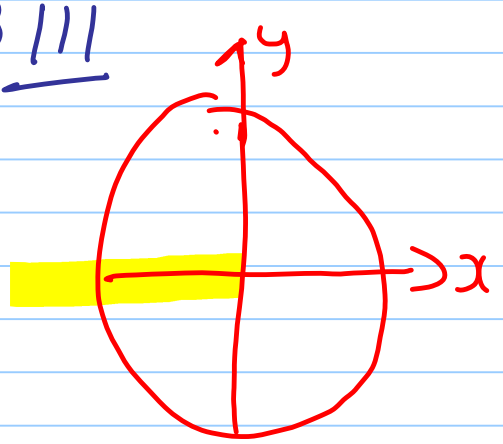
Use the unit circle to find all values of θ, $0 \leq \theta \leq 2\pi$, for which $\cos\theta = -\frac{\sqrt{3}}{2}$.

The value of Cosine is the x- Coordinate.

Since the value of Cosine is negative,

θ must lie in QII or QIII

So $\theta = \frac{5\pi}{6}$ or $\frac{7\pi}{6}$



Odd & even functions

Example

$$\sin\left(-\frac{7\pi}{6}\right) = -\sin\left(\frac{7\pi}{6}\right)$$ because sine function is odd.

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

$$= \frac{1}{2}.$$