$$\sin\theta = \frac{O}{H} = \frac{4}{5} \qquad\qquad \csc\theta = \frac{H}{O} = \frac{5}{4}$$

$$\cos\theta = \frac{A}{H} = \frac{3}{5} \qquad\qquad \sec\theta = \frac{H}{A} = \frac{5}{3}$$

$$\tan\theta = \frac{O}{A} = \frac{4}{3} \qquad\qquad \cot\theta = \frac{A}{O} = \frac{3}{4}$$

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

Quiz   Tues April 2nd 7.6

7.7   Graphs of other Trig Functions Cont'd

<u>Ex</u>: Graph $y = \cot x$

x	$y = \cot x$
0	undefined
$\pi/6$	1.7
$\pi/4$	1
$\pi/2$	0 ← CAUTION on CALCULATOR
$\frac{3\pi}{4}$	−1
$\frac{5\pi}{6}$	−1.7
π	undefined

Radian Mode $\dfrac{1}{\tan(\pi/6)}$

$\cot\frac{\pi}{2} = \frac{x}{y} = 0$

$\tan\frac{\pi}{2} = \frac{y}{x}$

$= $ undefined
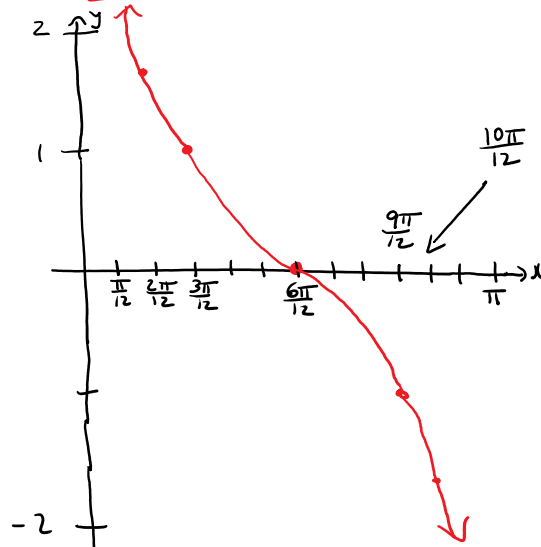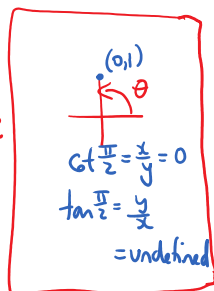
Properties of $y = \cot x$

1) Period π

2) V.A. $x = \ldots -\pi, 0, \pi, 2\pi, \ldots$
              (multiples of π)

3) Range $-\infty < y < \infty$

7.8   Phase Shift

Let $y = A \sin(\omega x - \phi) + C$

Standard Form:

$$y = A \sin\left[\omega\left(x - \frac{\phi}{\omega}\right)\right] + C \qquad \omega > 0$$

has amplitude $= |A|$

period $= \dfrac{2\pi}{\omega}$

phase shift $= \dfrac{\phi}{\omega}$ to the right

(horizontal shift)

Similarly $y = A \cos\left[\omega\left(x - \frac{\phi}{\omega}\right)\right] + C$

has amplitude $= |A|$

period $= \dfrac{2\pi}{\omega}$

phase shift $= \dfrac{\phi}{\omega}$ to the right

Ex: Graph $y = \sin\left(2x - \frac{\pi}{3}\right)$

Standard Form $\qquad y = \sin\left[2\left(x - \frac{\pi}{6}\right)\right]$

x	$y = \sin x$
0	0
$\pi/2$	1
π	0
$3\pi/2$	-1
2π	0

$\Big)$

New x-values

Divide each x by $\omega = 2$

then add $\dfrac{\emptyset}{\omega} = \dfrac{\pi}{6}$

Horizontal Compression
then Right Shift

x		y
$\frac{0}{2} + \frac{\pi}{6} = \pi/6 \left(= \frac{2\pi}{12}\right)$		0
$\frac{\pi}{4} + \frac{\pi}{6} = \frac{5\pi}{12}$		1
$\frac{\pi}{2} + \frac{\pi}{6} = \frac{8\pi}{12}$		0
$\frac{3\pi}{4} + \frac{\pi}{6} = \frac{11\pi}{12}$		-1
$\pi + \frac{\pi}{6} = \frac{14\pi}{12}$		0

$\frac{\pi}{12}$ $\frac{5\pi}{12}$ $\frac{8\pi}{12}$ $\frac{11\pi}{12}$ $\frac{14\pi}{12}$

1

-1

y

x