6.8 Inverse Trig Functions

Recall - Find inverse of $y = 3x - 2$

$x = 3y - 2$

$+2 \quad +2$

$x + 2 = 3y$

$\frac{x+2}{3} = \frac{3y}{3}$

$y^{-1} = \frac{x+2}{3}$

Basically, $\sin x$ is only invertable on the interval $[-\frac{\pi}{2}, \frac{\pi}{2}]$

$\cos x$ is only invertable on the interval $[0, \pi]$

Inverses of Trig fn.

$y = \sin^{-1} x$ or $\arcsin x$

$y = \cos^{-1} x$ or $\arccos x$

$y = \tan^{-1} x$ or $\arctan x$

$\sin^{-1} x \neq \frac{1}{\sin x}$

Recall (x, y) $(\cos\theta, \sin\theta)$

#22 Arc sin 0

Let $\theta = \text{Arc sin } 0$

$\sin\theta = 0$

0

#23 Arc cos 0

$\theta = \text{Arc cos } 0$

$\cos\theta = 0$

$\frac{\pi}{2}$

#24 $\tan^{-1} \frac{\sqrt{3}}{3}$

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

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

$\frac{y}{x}$

$\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} \rightarrow \frac{1}{2} \div \frac{\sqrt{3}}{2}$

$\frac{1}{2} \cdot \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

$\frac{\pi}{6}$

#25 $\sin^{-1}(\tan\frac{\pi}{4})$

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

$\sin^{-1}(1)$

$\theta = \sin^{-1}(1)$

$\sin\theta = 1$

$\frac{\pi}{2}$

#28 $\cos\left[\tan^{-1} 1 - \sin^{-1} 1\right]$

$\alpha = \tan^{-1} 1$

$\tan\alpha = 1$

$\frac{\pi}{4}$

$\beta = \sin^{-1} 1$

$\sin\beta = 1$

$\frac{\pi}{2}$

$\cos\left[\frac{\pi}{4} - \frac{\pi}{2}\right]$

$\cos(-\frac{\pi}{4})$ ← $\frac{\pi}{4}$

$\frac{\sqrt{2}}{2}$