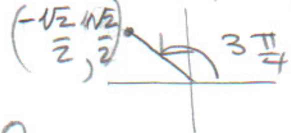
Extra examples

Interval

$\sin^{-1}\left(\sin \frac{3\pi}{4}\right) \neq \frac{3\pi}{4}$ $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

need to have:

look at $\sin \frac{3\pi}{4} = \frac{\sqrt{2}}{2}$



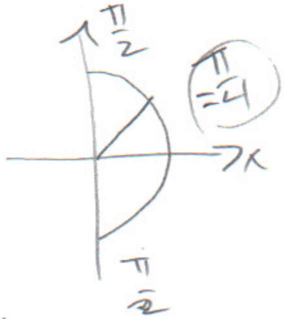
$\sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$

$\sin\theta = \frac{\sqrt{2}}{2}$ but θ

must be in our interval of $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

$\sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$

in our interval



$\therefore$

$\sin^{-1}\left(\sin \frac{3\pi}{4}\right) = \frac{\pi}{4}$

Where do we get $\sin\theta = \frac{\sqrt{2}}{2}$?

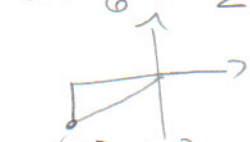
$\sin^{-1}\left(\sin \frac{7\pi}{6}\right) \neq \frac{7\pi}{6}$

Again out of interval

look at $\sin \frac{7\pi}{6}$

So we need a θ that gives a $\sin\theta = -\frac{1}{2}$ in our interval of $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

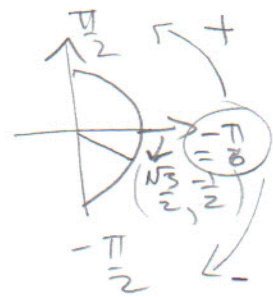
$\sin \frac{7\pi}{6} = -\frac{1}{2}$



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

$\sin\theta = -\frac{1}{2}$

$\theta = -\frac{\pi}{6}$



$[0, \pi]$

$\cos^{-1}\left(\cos \frac{4\pi}{3}\right) \neq \frac{4\pi}{3}$

look at $\cos \frac{4\pi}{3} = \frac{-1}{2}$

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

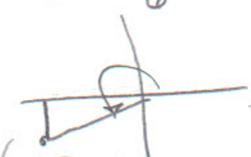
$\cos\theta = -\frac{1}{2}$

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

Interval $[0, \pi]$

$\sin^{-1}\left(\cos \frac{7\pi}{6}\right) = ??$

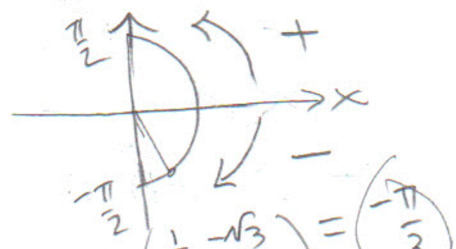
solve! $\cos \frac{7\pi}{6} = \frac{-\sqrt{3}}{2}$



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

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

use Interval $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$



$\theta = -\frac{\pi}{3}$