

# Warm Up 1/28

1) Write one goal for this mini-unit

2) a)  $\cos\left(\frac{5\pi}{6}\right) = -\frac{\sqrt{3}}{2}$       b)  $\tan\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}$

c)  $\sin\left(\frac{5\pi}{4}\right) = -\frac{\sqrt{2}}{2}$       d)  $\sec(135^\circ) = -\frac{2}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}}\right)$

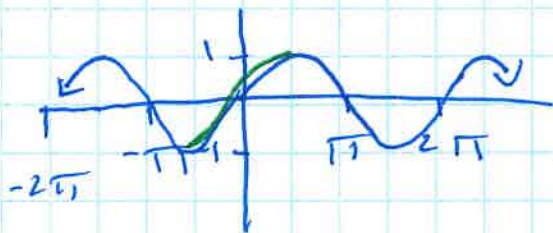
$= \frac{-2\sqrt{2}}{2} \sqrt{\frac{-\sqrt{2}}{-\sqrt{2}}}$

4.6 day 1 ex 1-3

Goal: Be able to use inverse trig to identify values on the unit circle.

- In order for your calculator to find an inverse - it must restrict the domain of the f(x) to the "principal branch" so it is 1 to 1.

$y = \sin x$



Principal Branch

$y = \sin x$

$y = \arcsin x$

Dom:  $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

Dom  $[-1, 1]$

Range  $[-1, 1]$

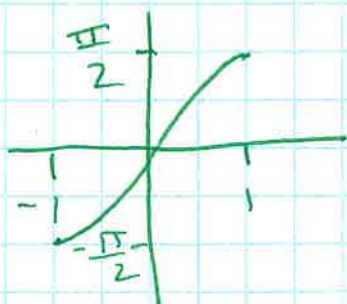
Range  $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

$y = \arcsin x$  /  $y = \sin^{-1}(x)$

ex)

$\sin^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{6}$

$\arcsin\left(\frac{1}{2}\right) = \frac{\pi}{6}$



What is the angle in radians  $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$  that gives you

$\sin x = \frac{1}{2}$

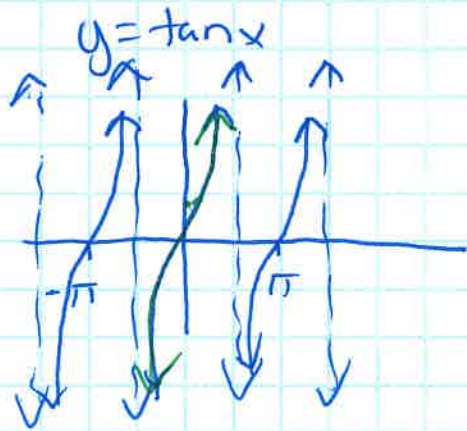
$$\text{ex)} \quad \arcsin\left(-\frac{\sqrt{2}}{2}\right) = -\frac{\pi}{4}$$

$$-\arcsin\left(\frac{\sqrt{2}}{2}\right) = -\frac{\pi}{4}$$

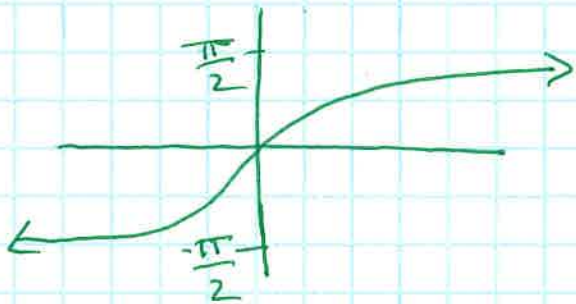
$$\sin^{-1}(3) = \text{DNE}$$

$$\text{y+)} \quad \textcircled{1} \quad \arcsin\left(-\frac{\sqrt{3}}{2}\right) = -\frac{\pi}{3} \quad \textcircled{2} \quad \sin^{-1}(1) = \frac{\pi}{2}$$

Arc tangent



$y = \arctan$



Principal Branch

$y = \tan x$

$$\text{Dom: } \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$$

$$\text{Range } (-\infty, \infty)$$

$y = \arctan$

$$\text{Dom } (-\infty, \infty)$$

$$\text{Range } \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$$

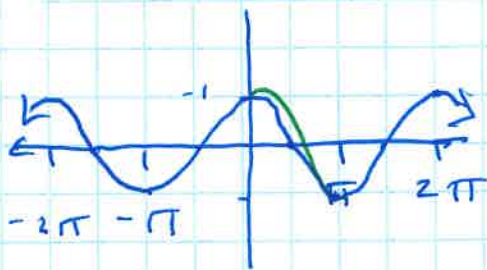
$$\text{ex)} \quad \tan^{-1}(-\sqrt{3}) = -\frac{\pi}{3}$$

$$\text{y+)} \quad \textcircled{1} \quad \tan^{-1}(-1) = -\frac{\pi}{4}$$

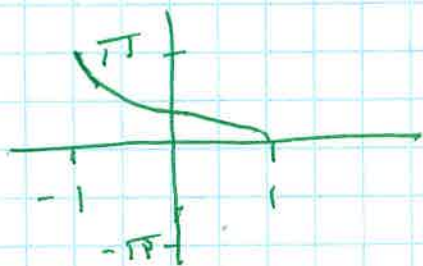
$$\textcircled{2} \quad \arctan\left(\frac{\sqrt{3}}{3}\right) = \frac{\pi}{6}$$

# Arc Cosine

$$y = \cos x$$



$$y = \arccos x$$



## Principal Branch

$$y = \cos x$$

$$\text{Dom: } [0, \pi]$$

$$\text{Rang: } [-1, 1]$$

$$y = \arccos x$$

$$\text{Dom: } [-1, 1]$$

$$\text{Rang: } [0, \pi]$$

ex)  $\arccos\left(-\frac{\sqrt{2}}{2}\right) = \frac{3\pi}{4}$

yt) ①  $\cos^{-1}\left(-\frac{1}{2}\right) = \frac{2\pi}{3}$

②  $\arccos\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{6}$

③  $\cos^{-1}(\pi) = \text{DNE}$