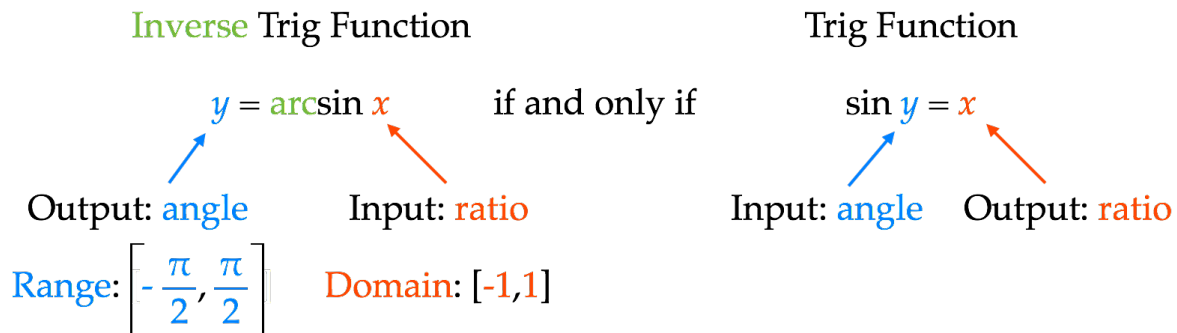


Inverse Trigonometric Functions



All trig functions are periodic and, thus, not one-to-one.

Therefore, to have an **inverse**, we must restrict the domain of each trig function.

Inverse Trig Function	Domain: ratio	Range: angle
$y = \arcsin x$	$-1 \leq x \leq 1$	$-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$
$y = \arccos x$	$-1 \leq x \leq 1$	$0 \leq y \leq \pi$
$y = \arctan x$	$-\infty \leq x \leq \infty$	$-\frac{\pi}{2} < y < \frac{\pi}{2}$
$y = \text{arccot } x$	$-\infty \leq x \leq \infty$	$0 < y < \pi$
$y = \text{arcsec } x$	$ x \geq 1$	$[0 \leq y \leq \pi \quad y \neq \frac{\pi}{2}]$
$y = \text{arccsc } x$	$ x \geq 1$	$[-\frac{\pi}{2} < y < \frac{\pi}{2} \quad y \neq 0]$

Evaluate the following

$$\arccos \frac{\sqrt{3}}{2}$$

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

Evaluate the following

$$\arccos 0$$

$$\arctan -\sqrt{3}$$

Properties of Inverse Trig Function

Given the inverse trig function is restricted to its domain...

$$\sin(\arcsin x) = x \qquad \arcsin(\sin x) = x$$

$$\cos(\arccos x) = x \qquad \arccos(\cos x) = x$$

$$\tan(\arctan x) = x \qquad \arctan(\tan x) = x$$

Same is true for other inverse trig functions.

Solve the following equations for x .

$$\arccos(2x - 1) = 0$$

$$\arcsin(x^2) = \frac{\pi}{2}$$

Solve the following equations for x .

$$\cos \left(\arcsin \frac{4}{5} \right)$$

$$\sin \left(\arccos x \right)$$