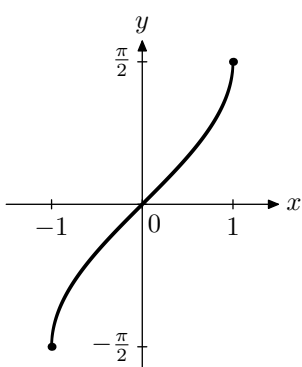
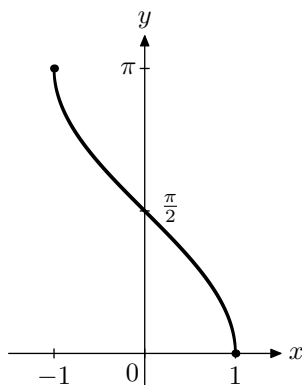


# Inverse Trigonometric Functions

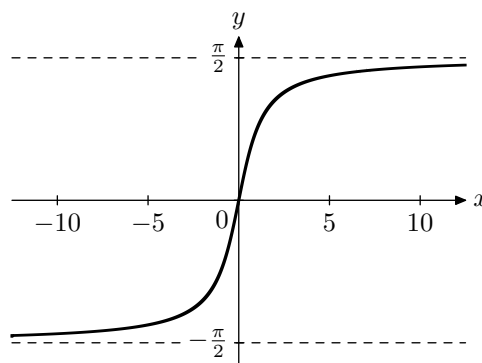
Function	Domain	Range
$\arcsin x$	$[-1, 1]$	$\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
$\arccos x$	$[-1, 1]$	$[0, \pi]$
$\arctan x$	$(-\infty, \infty)$	$\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$



Graph of  $y = \arcsin x$



Graph of  $y = \arccos x$



Graph of  $y = \arctan x$

## Composition

$$\begin{aligned} \sin(\arcsin x) &= x, & \text{for all } x \in [-1, 1] \\ \cos(\arccos x) &= x, & \text{for all } x \in [-1, 1] \\ \tan(\arctan x) &= x, & \text{for all } x \in (-\infty, \infty) \end{aligned}$$

$$\begin{aligned} \arcsin(\sin x) &= x, & \text{for all } x \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right] \\ \arccos(\cos x) &= x, & \text{for all } x \in [0, \pi] \\ \arctan(\tan x) &= x, & \text{for all } x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right) \end{aligned}$$

## Notation

$$\begin{aligned} \arcsin x &= \sin^{-1} x \\ \arccos x &= \cos^{-1} x \\ \arctan x &= \tan^{-1} x \end{aligned}$$



Note that the  $-1$  in these notations is not an exponent, e.g.,  $\sin^{-1} x \neq \frac{1}{\sin x}$ .