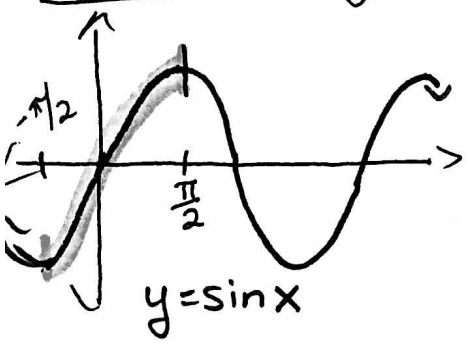
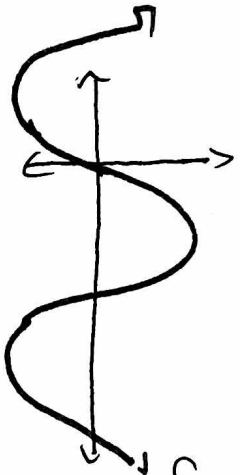
Inverse Trig Functions



Is this a function?

Yes, b/c passes VLT



Is this a function?

No, b/c fails VLT

★ We need to restrict the original domain

Sin x: D: $(-\infty,\infty)$ R: $[-1,1]$

Cos x: D: $(-\infty,\infty)$ R: $[-1,1]$

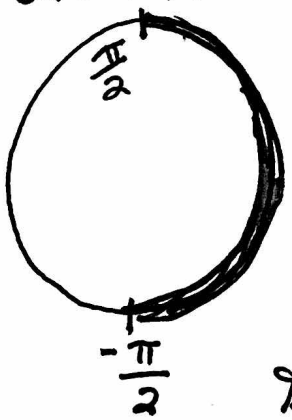
tan x: D: all reals except odd $\frac{\pi}{2}$ R: $(-\infty,\infty)$

$\sin^{-1}x$: D: $[-1,1]$ R: $[-\frac{\pi}{2},\frac{\pi}{2}]$

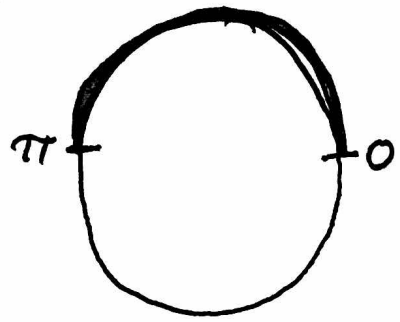
$\cos^{-1}x$: D: $[-1,1]$ R: $[0,\pi]$

$\tan^{-1}x$: D: $(-\infty,\infty)$ R: $(-\frac{\pi}{2},\frac{\pi}{2})$

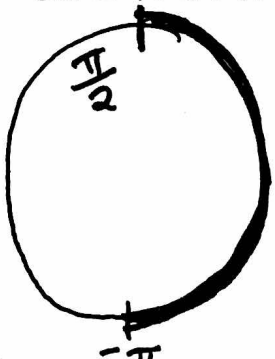
arcsin x



arccos x



arctan x



★ The answers are angles! ★

$\sin^{-1}\left(\frac{1}{2}\right) = \boxed{\frac{\pi}{6}}$ or ~~$\frac{5\pi}{6}$~~

Ask: at what angle is Sin ratio 1/2?

$\arccos\left(-\frac{\sqrt{3}}{2}\right) = \boxed{\frac{5\pi}{6}}$

$\arcsin(2) = \boxed{\text{undef}}$

$\tan^{-1}(\sqrt{3}) = \boxed{\frac{\pi}{3}}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

II I only ans

$\tan^{-1}(-\sqrt{3})$ $\boxed{-\frac{\pi}{3}}$