Inverse trig functions (sec. 7.8)
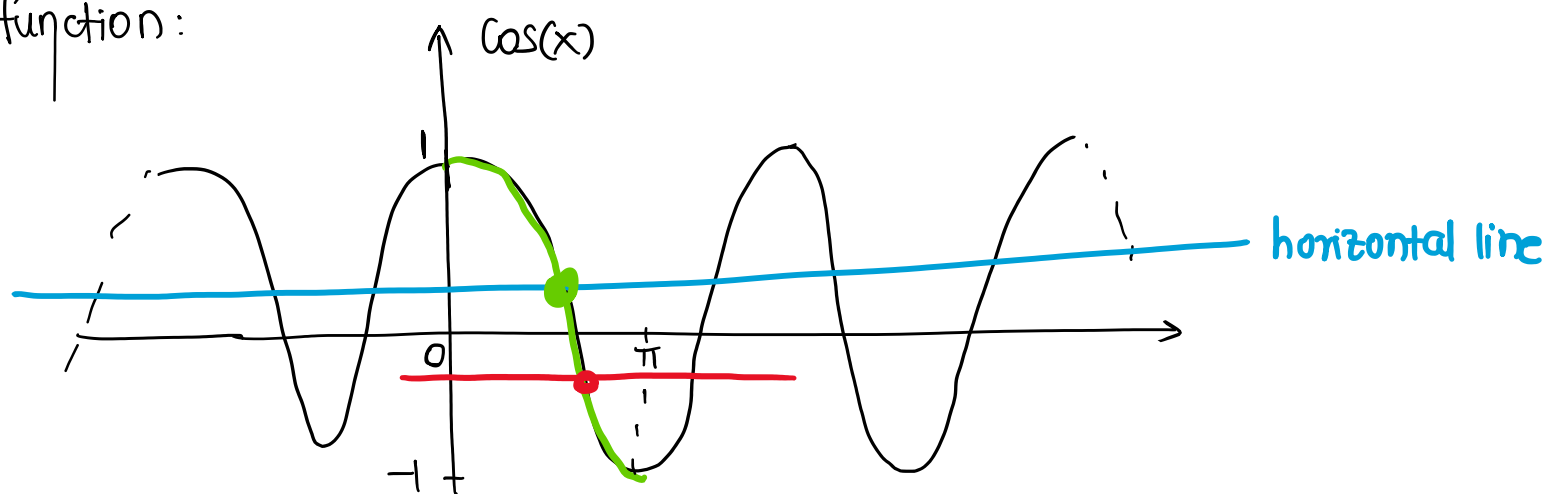
The inverse cosine function:

So to make the cosine function invertible we must restrict its domain to $0 \leq x \leq \pi$

The inverse cosine function (denoted by $\cos^{-1}(x)$, $\arccos(x)$) is the angle between 0 and π whose cosine is x.
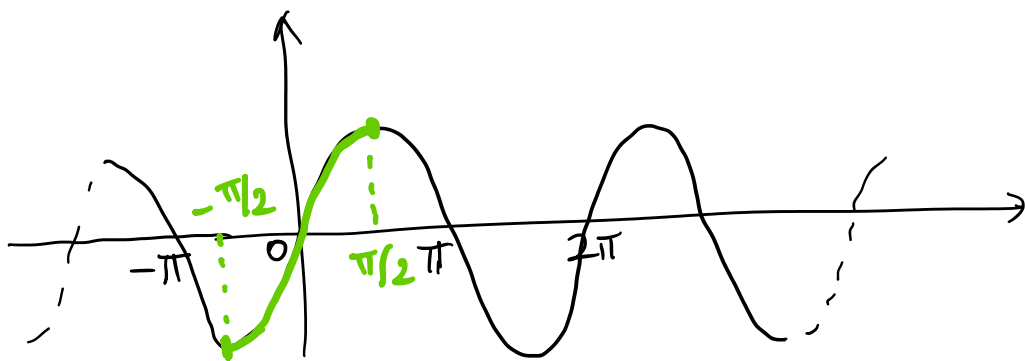
In other words we have

$$y = \cos^{-1} x \quad \text{provided} \quad x = \cos(y) \quad \text{and} \quad 0 \leq y \leq \pi$$

(Note $(\cos x)^{-1} \neq \cos^{-1} x$)
   ↑
reciprocal
   $\frac{1}{\cos x}$

Domain of $\cos^{-1} x$ is $-1 \leq x \leq 1$
Range of $\cos^{-1} x$ is $0 \leq y \leq \pi$.
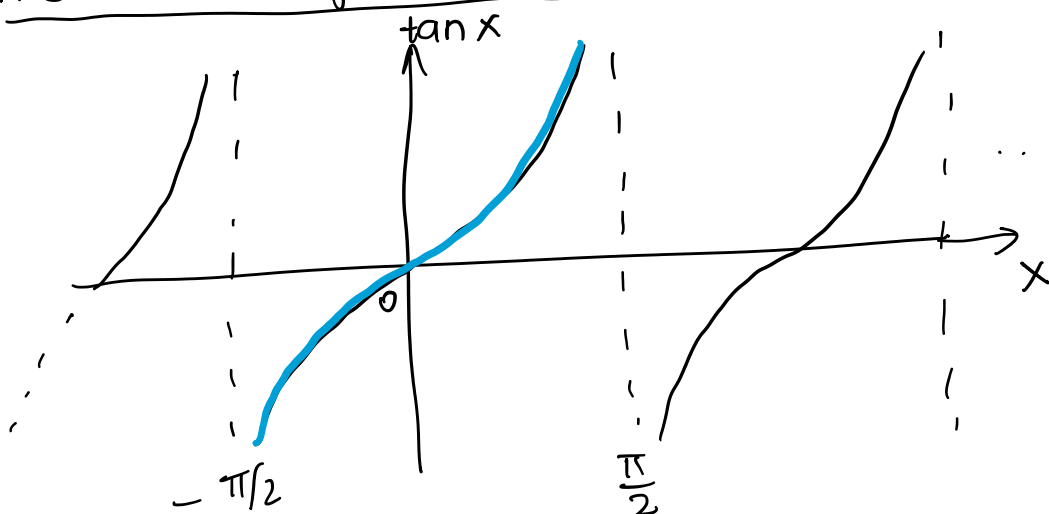
The inverse sine function

The domain of the inverse sine function is $-1 \leq x \leq 1$
The range of the inverse sine function is $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$.

This function is denoted by $\boxed{\sin^{-1}(x)}$ or $\boxed{\arcsin(x)}$ WebWork: $\text{asin}(x)$.

The inverse tangent function

The domain of the inverse tangent function is $-\infty < x < \infty$
The range of the inverse tangent function is $-\frac{\pi}{2} < y < \frac{\pi}{2}$ (endpoints not included).