

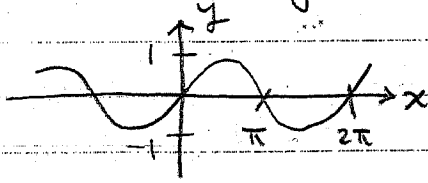
SUMMARY OF INVERSE TRIG FUNCTIONS

①

$f(x) = \sin^{-1}(x)$ or $\arcsin(x)$.

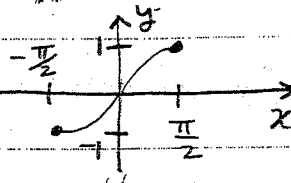
Definition

① start with $y = \sin x$



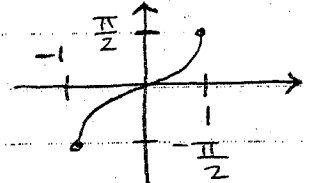
$y = \sin(x)$

② restrict domain



$y = \sin(x), -\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$

③ reflect about $y=x$



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

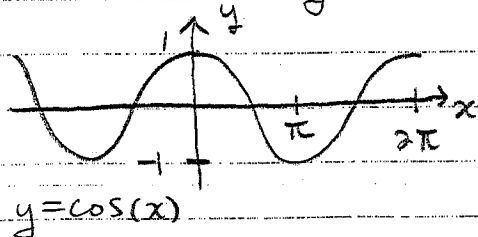
∴ $f(x) = \sin^{-1}(x)$
= angle y in $[-\frac{\pi}{2}, \frac{\pi}{2}]$ such that $\sin(y) = x$

$\frac{d}{dx} [\sin^{-1}(x)] = \frac{1}{\sqrt{1-x^2}}, -1 < x < 1$

$f(x) = \cos^{-1}(x)$ or $\arccos(x)$.

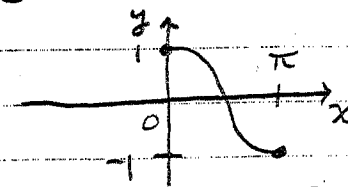
Definition:

① start with $y = \cos(x)$



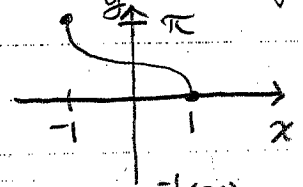
$y = \cos(x)$

② restrict domain



$y = \cos(x), 0 \leq x \leq \pi$

③ reflect about $y=x$



$y = \cos^{-1}(x)$

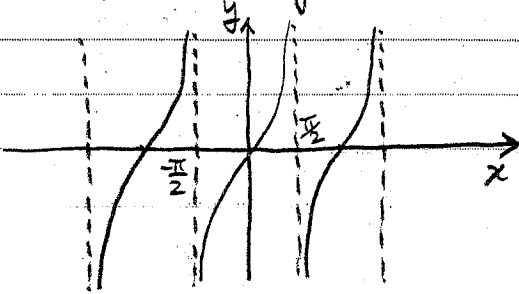
∴ $f(x) = \cos^{-1}(x)$ = angle y in $[0, \pi]$ such that $\cos(y) = x$

$\frac{d}{dx} [\cos^{-1}(x)] = \frac{-1}{\sqrt{1-x^2}}, -1 < x < 1$

$f(x) = \tan^{-1}(x)$ or $\arctan(x)$

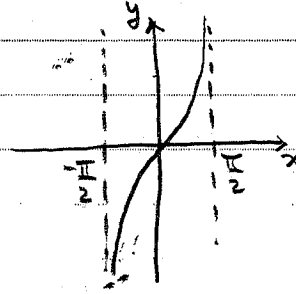
Definition:

① start with $y = \tan(x)$

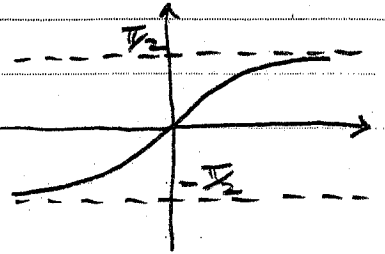


$y = \tan(x)$

② restrict domain



③ reflect about $y=x$



$y = \tan^{-1}(x)$

$\therefore f(x) = \tan^{-1}(x) = \text{angle } y \text{ in } (-\frac{\pi}{2}, \frac{\pi}{2}) \text{ such that } \tan(y) = x$

$\frac{d}{dx} [\tan^{-1}(x)] = \frac{1}{1+x^2}$