Day 11 Notes KEY

Thursday, January 22, 2015 7:13 PM

4.7 : More Inverse Trig

A few more practice...

① $\cos\left[\tan^{-1}\left(\frac{\sqrt{3}}{3}\right)\right]$ ② $\arcsin\left[\sin\left(\frac{2\pi}{3}\right)\right]$ ③ $\cos^{-1}\left[\cos\left(-\frac{\pi}{4}\right)\right]$

$\cos(30°) = \boxed{\frac{\sqrt{3}}{2}}$ $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = \boxed{60° \text{ or } \frac{\pi}{3}}$ $\cos^{-1}\left(\frac{\sqrt{2}}{2}\right) = \boxed{45° \text{ or } \frac{\pi}{4}}$

④ $\sin\left[18\cos^{-1}\left(\frac{1}{2}\right)\right]$

$\sin\left[18\left(\frac{\pi}{3}\right)\right]$

$\sin(6\pi) = \sin(2\pi) = \boxed{0}$

coterminal

⑤ $\tan\left[12\sin^{-1}\left(-\frac{1}{2}\right)\right]$

$\tan\left[12\left(-\frac{\pi}{6}\right)\right]$

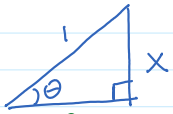
$2\pi = (1,0)$

$\tan(-2\pi) = \tan(2\pi) = \frac{0}{1} = \boxed{0}$

Another type of problem...

Find an equivalent algebraic expression.

⑥ $\cos(\sin^{-1}x)$



$a^2 + x^2 = 1$

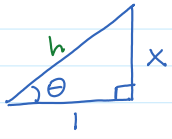
$a^2 = 1 - x^2$

$a = \sqrt{1 - x^2}$

$\sqrt{1-x^2}$

$\cos\theta = \boxed{\sqrt{1 - x^2}}$

⑦ $\cos(\tan^{-1}x)$

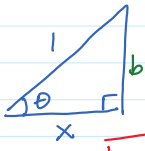


$1 + x^2 = h^2$

$h = \sqrt{1 + x^2}$

$\cos\theta = \boxed{\frac{1}{\sqrt{1 + x^2}}}$

⑧ $\cot(\arccos x)$



$b^2 + x^2 = 1$

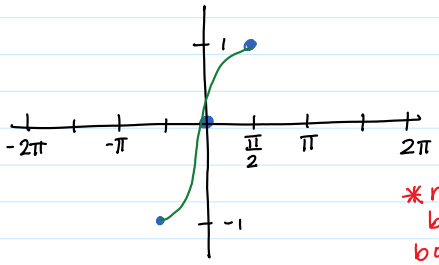
$b = \sqrt{1 - x^2}$

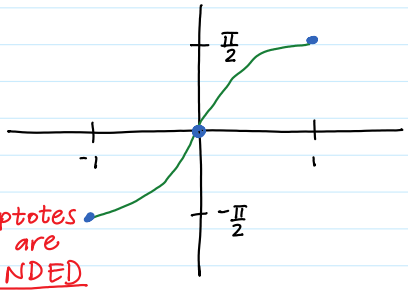
$\cot\theta = \boxed{\frac{x}{\sqrt{1 - x^2}}}$

Let's think about inverse graphs...

$\boxed{y = \sin x}$ * domain $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$

$\boxed{y = \sin^{-1}x}$



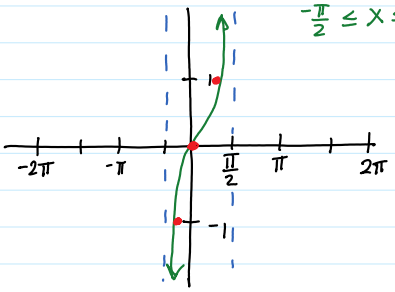


*no asymptotes but they are both BOUNDED

y = tan x

$y = \frac{\sin}{\cos}$

*domain $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$



*vertical asymptotes become horizontal asymptotes

y = arctan x