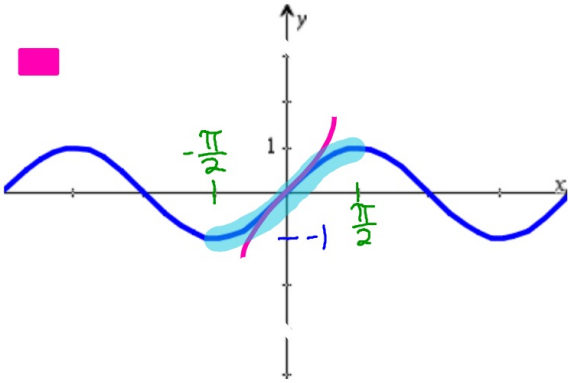
October 22

SWBAT:

Graph and Evaluate Inverse Trig Functions

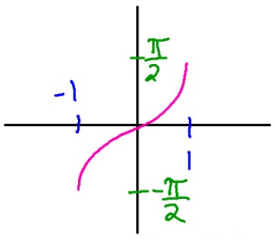
Inverse of $\sin(x)$



$\arcsin(x)$

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

*answer is the angle



Domain: $-1 \leq x \leq 1$

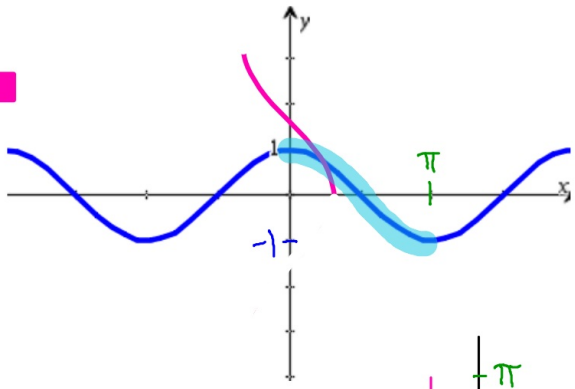
Range: $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$

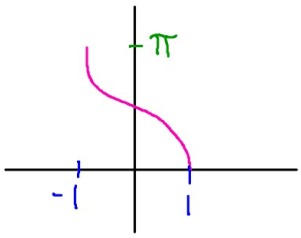
$\sin\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$

$\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{3}, \frac{2\pi}{3}$

$\sin^{-1}\left(-\frac{1}{2}\right) = \frac{7\pi}{6}, \frac{11\pi}{6}, -\frac{\pi}{6}$

Inverse of $\cos(x)$





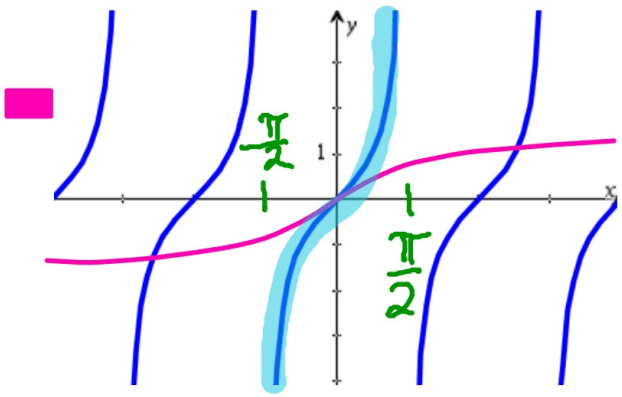
$\arccos(x)$

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

Domain: $-1 \leq x \leq 1$

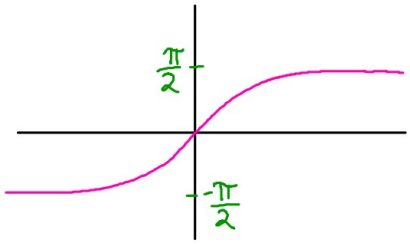
Range: $0 \leq y \leq \pi$

Inverse of tan(x)



$\arctan(x)$

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



Domain: all real #s

Range: $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$

Evaluate

$\arcsin(1) = \frac{\pi}{2}$

$\arccos(1/2) = \frac{\pi}{3}$

$\arctan(0) = 0$

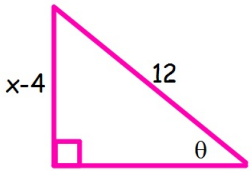
$\sin^{-1}(1/2) = \frac{\pi}{6}$

$\cos^{-1}(1) = 0$

$\tan^{-1}(1) = \frac{\pi}{4}$

$\frac{\sqrt{3}}{3} = \frac{1}{\sqrt{3}}$

Write θ as a function of x



$opp = x-4$

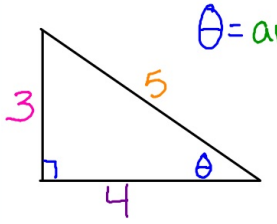
$hyp = 12$

$\sin\theta = \frac{x-4}{12}$

$\theta = \sin^{-1}\left(\frac{x-4}{12}\right)$

Use a right triangle to find the exact value

sin(arctan(3/4))



$\theta = \arctan\left(\frac{3}{4}\right)$

$3 = opp$

$4 = adj$

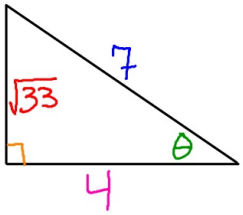
$3^2+4^2=c^2$

$5=c$

$\sin\left(\arctan\left(\frac{3}{4}\right)\right)$

$\sin(\theta)=\frac{3}{5}$

cot(arccos(4/7))



$\theta = \arccos\left(\frac{4}{7}\right)$

$4 = adj$

$7 = hyp$

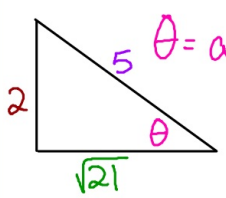
$7^2=4^2+b^2$

$\sqrt{33}=b$

$\cot\left(\arccos\left(\frac{4}{7}\right)\right)$

$\cot(\theta)=\frac{4}{\sqrt{33}}$

sin(arcsin(2/5))=



$\theta = \arcsin\left(\frac{2}{5}\right)$

$\sin\left(\arcsin\left(\frac{2}{5}\right)\right)$

$\sin(\theta) = \frac{2}{5}$

cos(arccos(0.9))= 0.9

arctan(tan(20)) = 20