SEC 3.5 INVERSE TRIG FUNCTIONS

REVIEW

$f(x) = x^2$ DOES THE FUNCTION HAVE AN INVERSE?
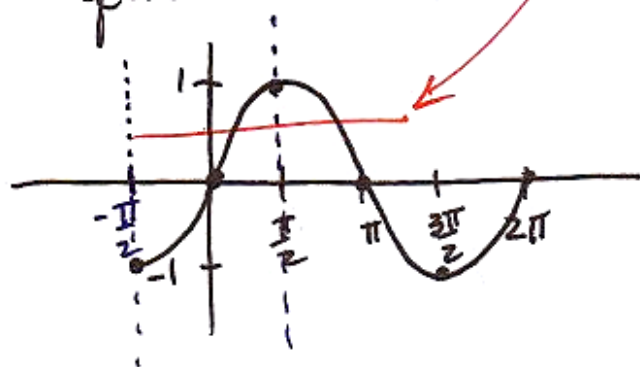
NO!

DOESN'T PASS THE HORIZONTAL LINE TEST.

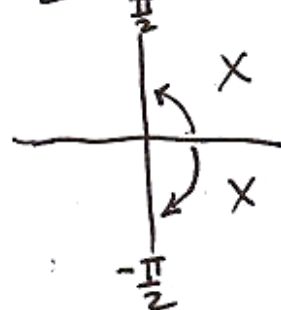## SINE FUNCTION
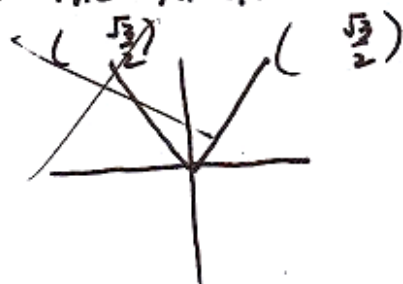
$f(x) = \sin x$

$\sin^{-1}$

$-\dfrac{\pi}{2} \leq X \leq \dfrac{\pi}{2}$

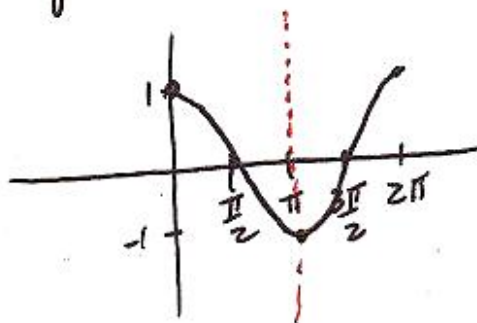$\sin^{-1}\left(\dfrac{\sqrt{3}}{2}\right) = Y$

FIND THE ANGLE WHOSE SIN IS $\dfrac{\sqrt{3}}{2}$ $= \dfrac{\pi}{3}$

$\sin^{-1}\left(-\dfrac{\sqrt{2}}{2}\right) = -\dfrac{\pi}{4}$
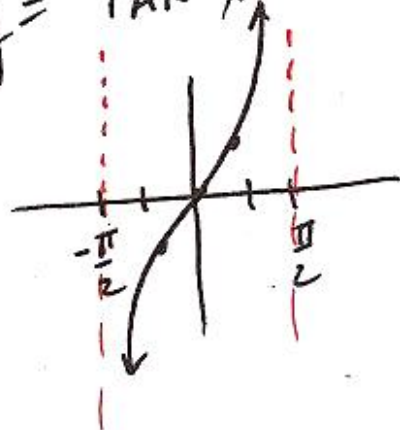
COSINE FUNCTION

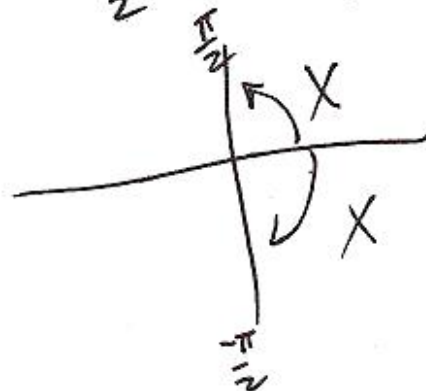$$y = \cos x$$

$\cos^{-1}$

$$0 \le x \le \pi$$

TANGENT FUNCTION

$$y = \tan x$$
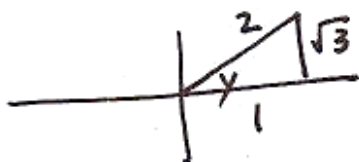

$\tan^{-1}$

$$-\frac{\pi}{2} < x < \frac{\pi}{2}$$

COMPOSITION OF FUNCTIONS

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

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

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

53. $\sin\left(\underbrace{\sin^{-1} \frac{2}{3}}_{X} + \underbrace{\cos^{-1} \frac{1}{2}}_{Y} \right)$
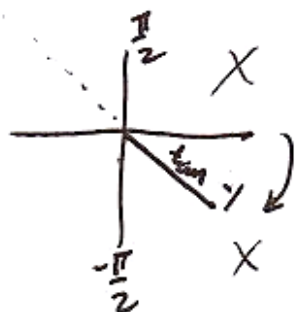
$\sin x \cos y + \cos x \sin y$
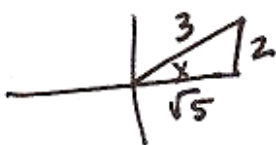
$\frac{2}{3} \cdot \frac{1}{2} + \frac{\sqrt{5}}{3} \cdot \frac{\sqrt{3}}{2}$

$\frac{1}{3} + \frac{\sqrt{15}}{6}$

$\boxed{\dfrac{2 + \sqrt{15}}{6}}$

H.W. #5 $\tan^{-1}(-1)$ = $\boxed{-\dfrac{\pi}{4}}$
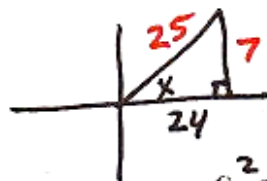

9. $\sec^{-1}(2)$

$\cos^{-1}\left(\dfrac{1}{2}\right)$ = $\boxed{\dfrac{\pi}{3}}$

21. $\cos\left(\cos^{-1}\dfrac{1}{2}\right)$ = $\boxed{\dfrac{1}{2}}$

45. $\cos\left(\sin^{-1}\dfrac{7}{25}\right)$ OPP / HYP

↑
REPRESENTS AN ANGLE

$\boxed{\dfrac{24}{25}}$

$a^2 + b^2 = c^2$
$a^2 + 7^2 = 25^2$
$a^2 + 49 = 625$
$-49 \quad -49$
$\sqrt{a^2} = \sqrt{576}$
$a = 24$

TEST QUESTION   X (angle)

$\sin\left(\cos^{-1}\dfrac{12}{13}\right)$

$\boxed{\dfrac{5}{13}}$