office hours

M, F 11-12

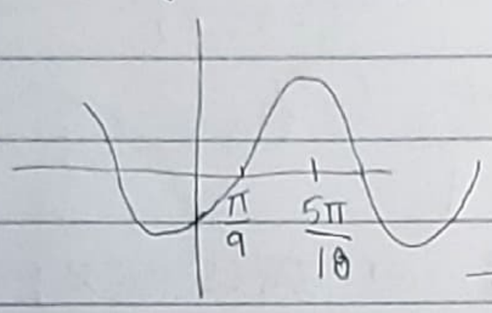
T, T 2-3

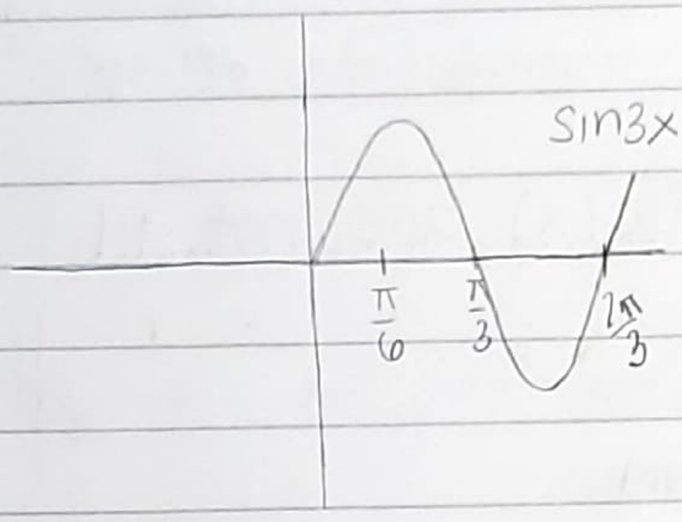
$f(x) = A\sin(\omega x - \phi)$

amplitude | angle of freq. | phase shift

(ex) $f(x) = 2\sin\left(3x - \frac{\pi}{3}\right)$

$= 2\sin\left(3\left(x - \frac{\pi}{9}\right)\right)$

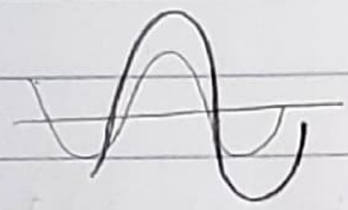




→ period is the same after the shift ($\frac{2\pi}{3}$)

just the starting place is different

then scale by 2 →



→ $2\sin\left(3x - \frac{\pi}{3}\right)$

$f(x) = 2\sin x + 5\cos x$

$A = \sqrt{2^2+5^2} = \sqrt{29}$

$f(x) = \sqrt{29}\left(\frac{2}{\sqrt{29}}\sin x + \frac{5}{\sqrt{29}}\cos x\right)$

use calculator to find ϕ: → $\sin^{-1}$ $\cos^{-1}$

$\sin\phi = \frac{2}{\sqrt{29}}$, $\cos\phi = \frac{5}{\sqrt{29}}$

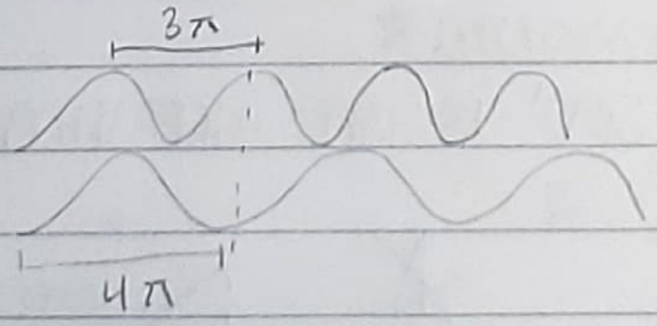
$\sqrt{29}(\sin\phi\sin x + \cos\phi\cos x) = \sqrt{29}(\cos x - \phi)$

period of sum

15 May 2023

$f(x) + g(x)$ what's the period. → 12π, have to find the common multiple

3π 4π



inverse trig func

Recall:

A func has an inverse if it's 1:1 ($1y \to 1x$)

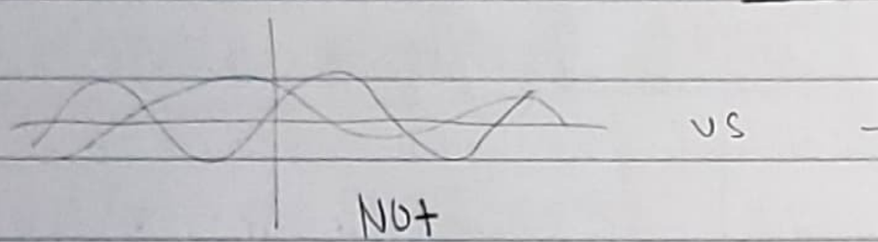
$y = f(x)$

$x = f^{-1}(y)$ ⟶ inverse func of y

$y = x^2$ and $x = \sqrt{y}$

inverse

$\sin(x)$ and $\cos(x)$ are <u>not</u> 1:1



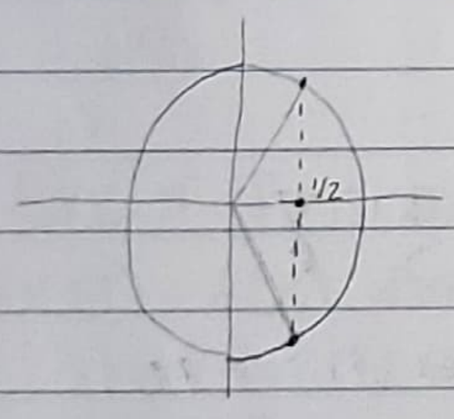
$\sin^{-1} x$ or $\arcsin(x)$

↳ defined $[-1, 1]$

inverse trig cont...

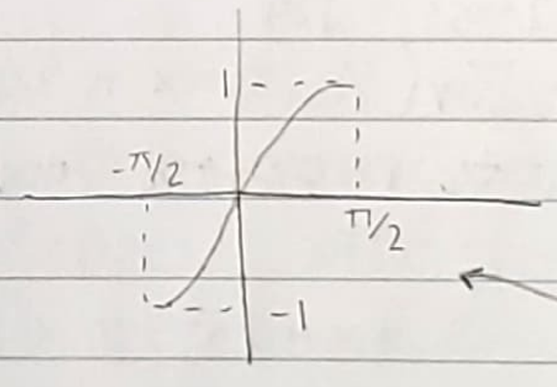
16 may 2023

If $\cos\theta = 1/2$, what's θ? ⟶ why we need inverses



$\cos\left(\frac{\pi}{3}\right) = \frac{1}{2}$

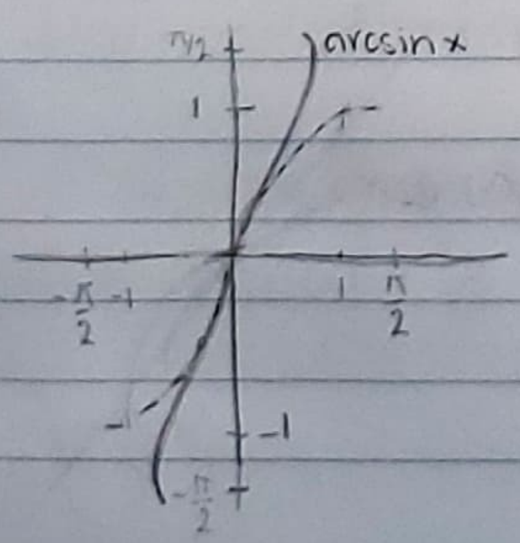
$\cos\left(-\frac{\pi}{3}\right) = \frac{1}{2}$



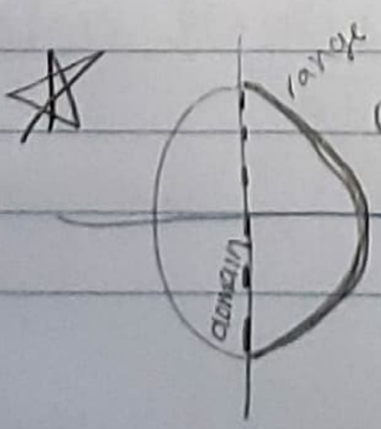
arcsin x is the inverse of sinx

- $\arcsin(x)$
  - has a domain of $[-1, 1]$
  - has a range of $[-\pi/2, \frac{\pi}{2}]$

} opposite of $\sin(x)$ (restricted)



$\sin^{-1}$ is an increasing function



arcsin only takes values from the right side of the unit circle