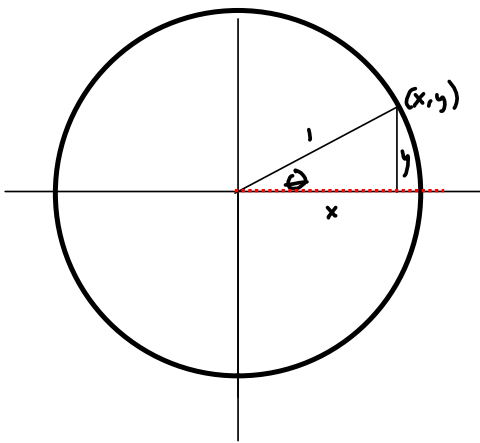
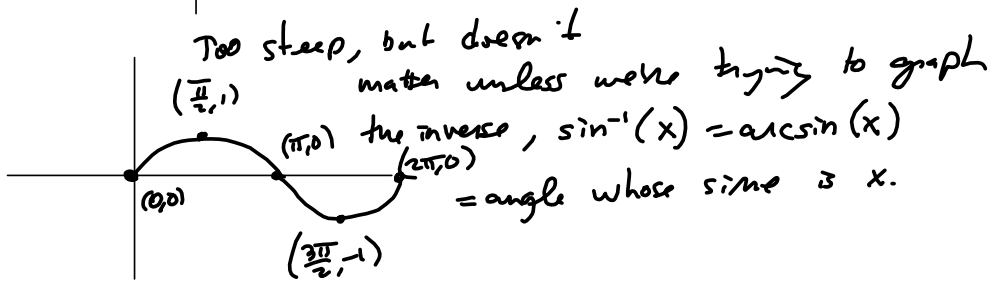
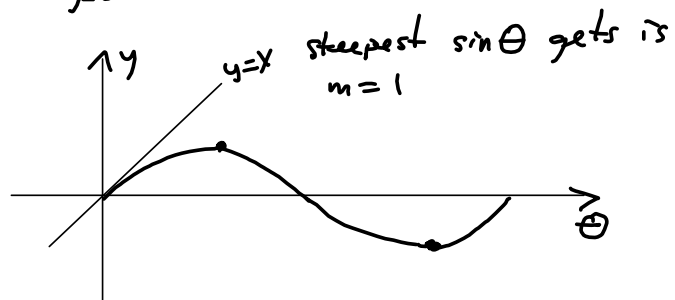


S1.6-1.8 This week.
 week 3 written due tonight



$$x = \cos \theta$$

$$y = \sin \theta$$



The period of sine is $2\pi = 360^\circ$

Other versions:

$$f(x) = a \sin(b(x-c)) + d$$

$$= 71 \sin\left(\frac{\pi}{6}x + \frac{11\pi}{3}\right) - 80$$

$$= 71 \sin\left(\frac{\pi}{6}(x+22)\right) - 80$$

$$\frac{\frac{11\pi}{3}}{\frac{\pi}{6}} = \frac{11\pi}{3} \cdot \frac{6}{\pi} = 22$$

Period of $\sin(x)$ is 2π

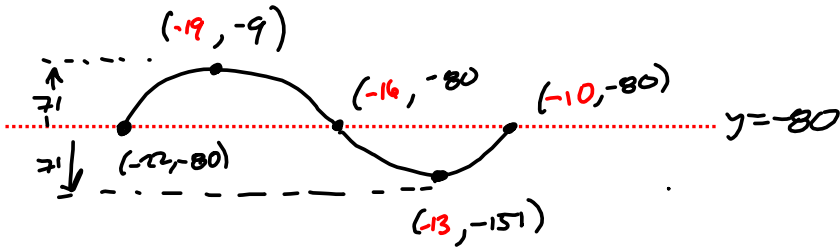
Period of $\sin\left(\frac{\pi}{6}x\right)$ is period of $\sin\left(\frac{\pi}{6}(x+22)\right)$

$x \rightarrow x-22$
Left 22

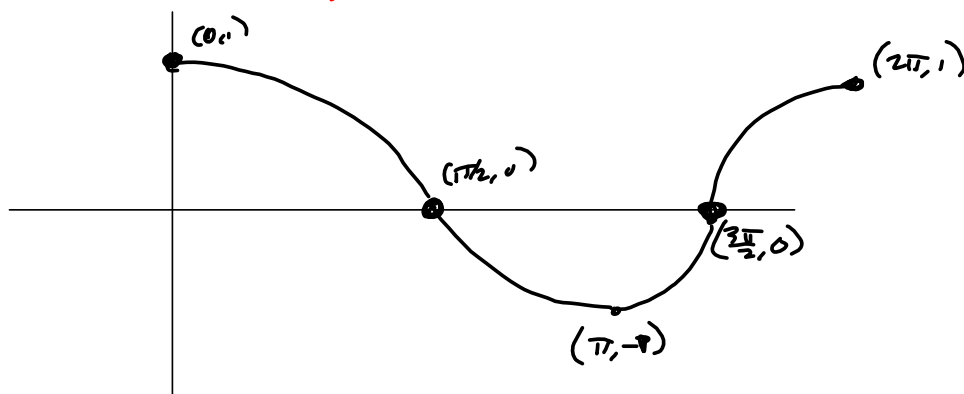
When is $\frac{\pi}{6}x = 2\pi$?

When $x = (2\pi) \left(\frac{6}{\pi}\right) = \boxed{12 = \text{PERIOD}}$

$= 71 \sin\left(\frac{\pi}{6}(x+22)\right) - 80$
 $y \rightarrow 71y$ (Amplitude)
 Period is 12
 $y \rightarrow y-80$ ($y = -80$ is midline)
 left 22
 $x \rightarrow x-22$



Model hours of daylight with a cosine function:



Period = 365 days

High point: June 21st Summer Solstice.

Low point: Dec 21st

$$bx = 2\pi \text{ when } x = 365$$

$$365b = 2\pi$$

$$b = \frac{2\pi}{365}$$

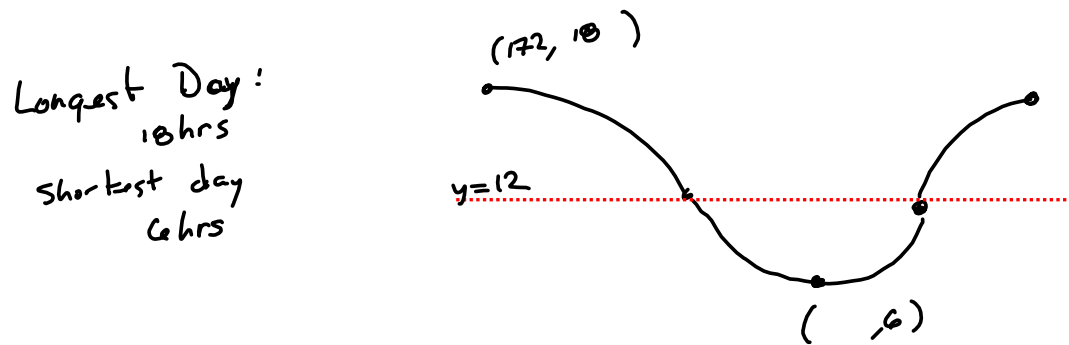
$$2 \cos\left(\frac{2\pi}{365}x\right) + d$$

J F M A M J

31 28 31 30 31 21

$$J_{21} \approx x = 172$$

$$2 \cos\left(\frac{2\pi}{365}(x-172)\right) + d$$



$$\frac{18+6}{2} = \frac{24}{2} = 12$$

$$y = a \cos\left(\frac{2\pi}{365}(x-172)\right) + 12$$

$$y = 6 \cos\left(\frac{2\pi}{365}(x-172)\right) + 12$$

For a SINE, it starts @ the midline
midline @ Equinox:

Mon 21st OR SEPTEMBER 21st

Notes for INVERSE FUNCTIONS (Theory)

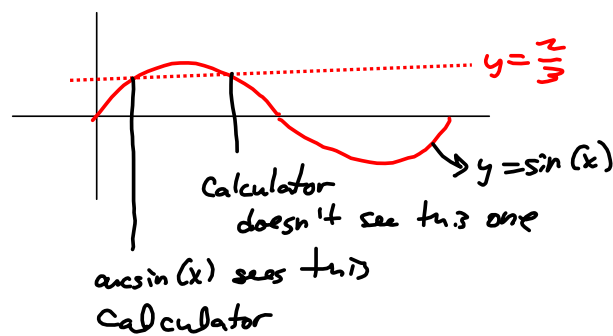
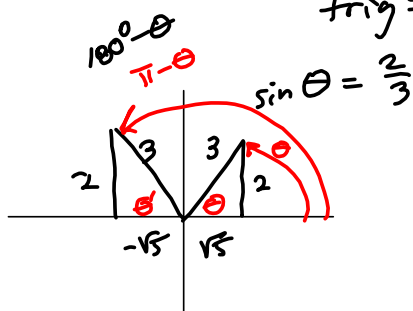
https://harryzaims.com/public_html/122/videos/chapter-01/1-7/1-7-notes.pdf

CLICK HERE FOR S1.7 videos

The 00a.mp4, 00b.mp4, etc., give a decent general talk on inverse functions.

The issue with inverse functions is they only spit out one angle, when

$\text{trig} = \frac{2}{3}$ always has 2 pictures/angles

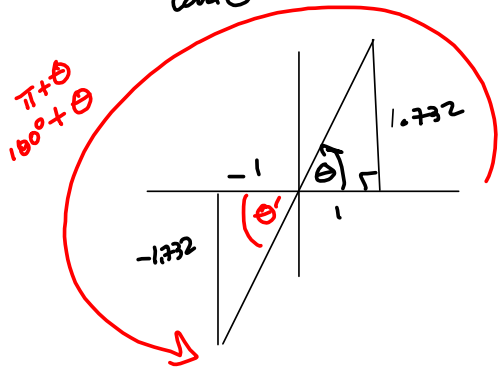


Desmos says $\sin^{-1}\left(\frac{2}{3}\right) = \arcsin\left(\frac{2}{3}\right) \approx 41.8103148958^\circ$

The other solution is $180^\circ - 41.8103148958^\circ \approx 138.189685104^\circ$

What about decimal trig ratios, like...

$\tan \theta = 1.732$

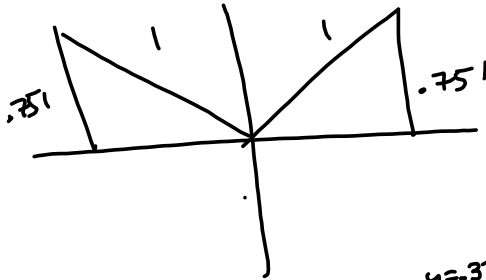


sin

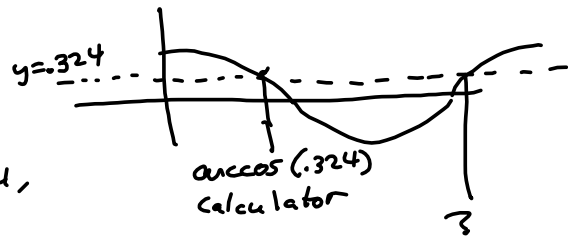
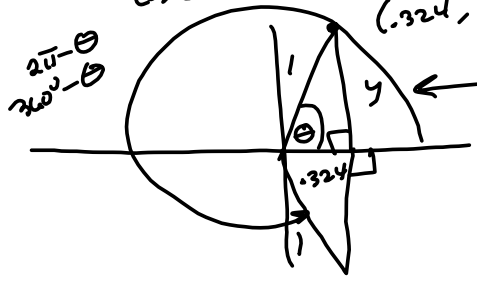
arctan(1.732) and $180^\circ + \arctan(1.732)$

($\sin(\theta) = 1.732 > 1$?! NEVER!)

$\sin \theta = .751$



$\cos \theta = .324$



$\sqrt{1^2 - .324^2} = y = \sin \theta$