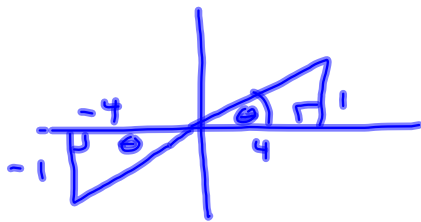
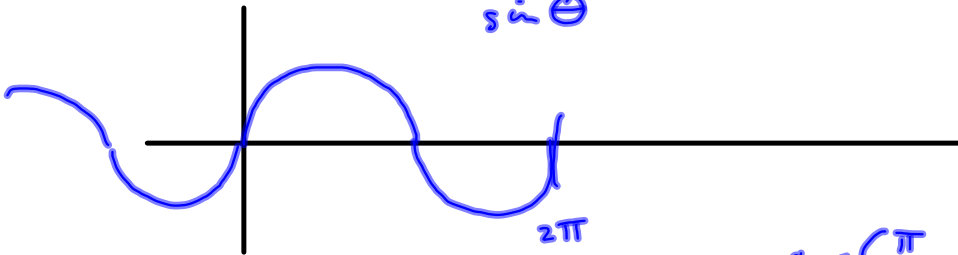


$\cot \theta = 4$ is ambiguous.

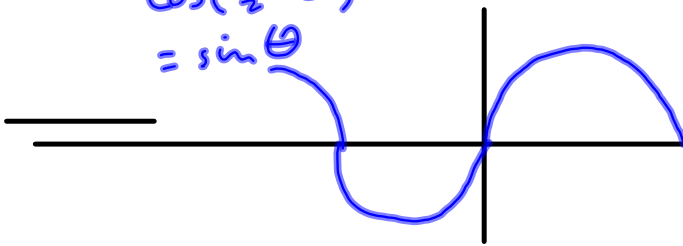


$$\cos\left(\frac{\pi}{2} - \theta\right) = \frac{\sin \theta}{\sin \theta}$$

cofunction identity



$$\cos\left(\frac{\pi}{2} - \theta\right) = \sin \theta$$



$$\begin{aligned} \cos\left(\frac{\pi}{2} - \theta\right) &= \cos(-\theta + \frac{\pi}{2}) \\ &= \cos(-(\theta - \frac{\pi}{2})) \\ &\textcircled{1} \cos(-\theta) \\ &\textcircled{2} \cos(-(\theta - \frac{\pi}{2})) \end{aligned}$$

Example 7

High @ 4am } 6 hrs from high to low.
 Low @ 10am }

Let 12am correspond to $t=0$ (and $t=24$)

Period of the tides is 24 hours.

$\sin\left(\frac{\pi}{12}x\right)$ has period 24. $\frac{2\pi}{b} = 24$

High point: 11.3 feet 4am

Low point: .1 foot 10am

$$\frac{2\pi}{24} = b = \frac{\pi}{12}$$

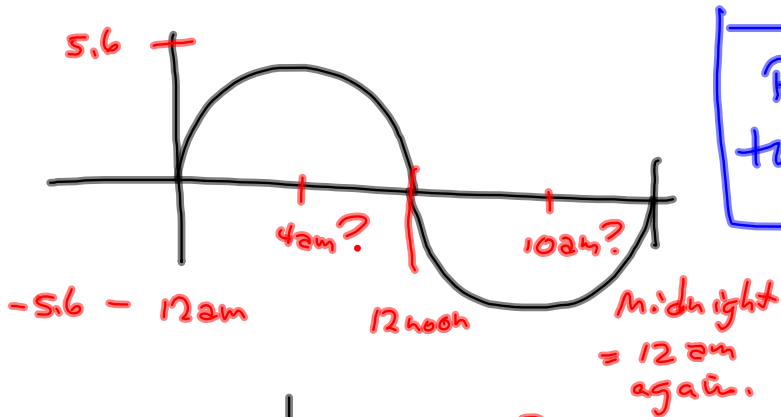
When does it reach mid-height? $\frac{10+4}{2} = 7$ am

Want midpoint @ 7 am.

When's the NEXT midpoint? 7pm (12 hrs later)

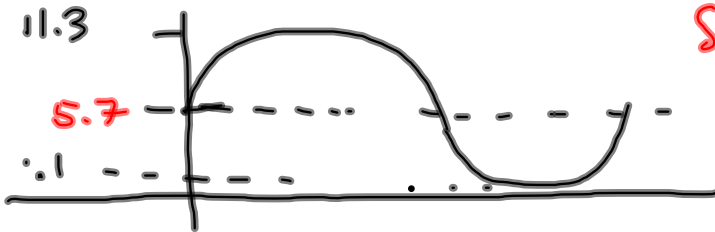
$$\text{Amplitude} = \frac{\text{High} - \text{Low}}{2} = \frac{11.3 - .1}{2} = \frac{11.2}{2} = 5.6 \text{ ft}$$

$5.6 \sin(\frac{\pi}{12}x)$ has these 2 features.



Pick up on this Monday
Quiz Wednesday.

We want
 High = 11.3
 Low = 0.1



So now, we're here:
 $5.6 \sin(\frac{\pi}{12}x) + 5.7$

5.6 is the amplitude.
 what's the middle height?

$$\frac{11.3 + 0.1}{2} = \frac{11.4}{2} = 5.7$$