

Section 3-5 Circular Functions vs Trig Functions

In many real-world situations, the independent variable of a periodic function is time or distance, with no angle evident. (ex. Daily high temperature varies periodically with the day of the year)

Circular Functions are periodic functions whose independent variable is a real number without any units. They are identical to **Trigonometric Functions** except for their argument.

Circular functions are $\sin x$, $\cos x$, $\tan x$, $\csc x$, $\sec x$, $\cot x$ and are graphed in **radians**
Trig functions are $\sin \theta$, $\cos \theta$, $\tan \theta$, $\csc \theta$, $\sec \theta$, $\cot \theta$ and are graphed in **degrees**

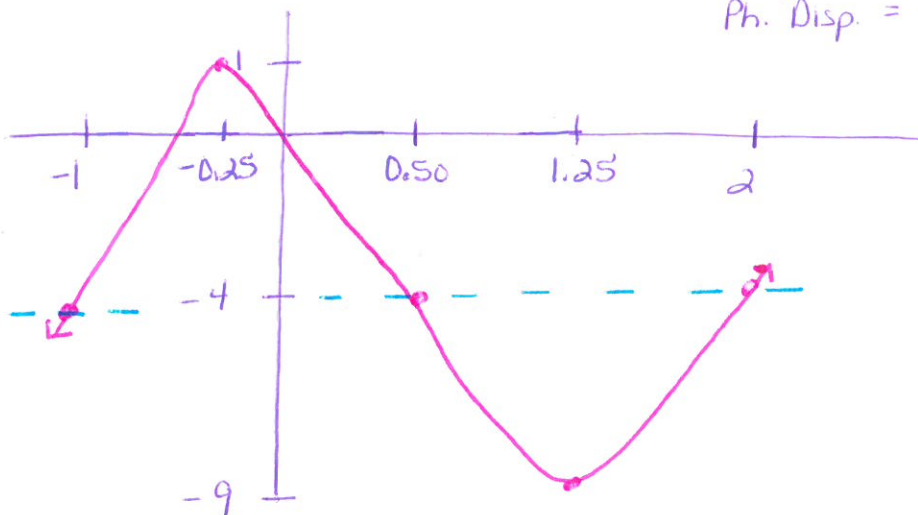
** In this class*

In other classes, x may be used to represent an angle in both deg. & radians.

Graph.

1. $y = -4 + 5\sin\frac{2\pi}{3}(x + 1)$

*S.A. = -4
 Amp = 5
 Ph. Disp. = left 1*



To find period:

$$2\pi \times \text{hd} = \text{period}$$

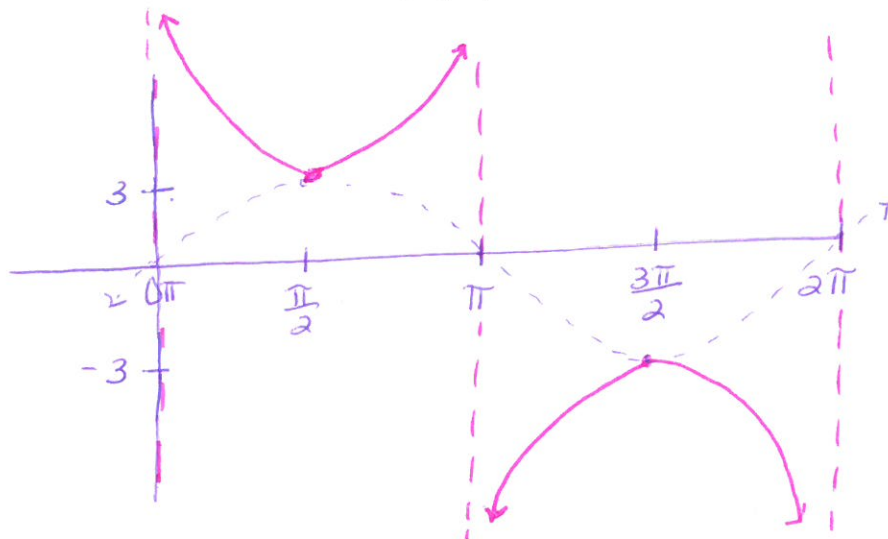
$$2\pi \times \frac{3}{2\pi} = \text{period}$$

$$3 = \text{period}$$

Intervals: $\frac{\text{period}}{4} = \frac{3}{4}$

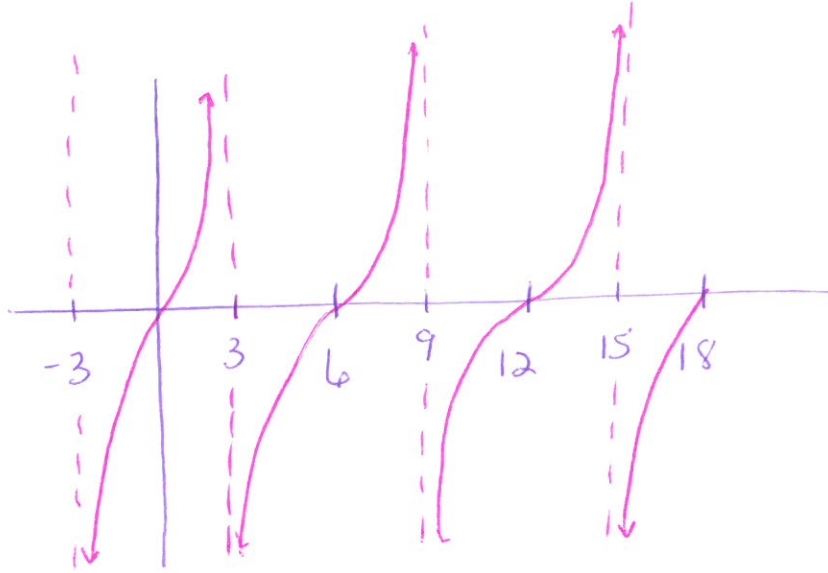
2. $y = 3 \csc x$

**graph $y = 3\sin x$ first and then use reciprocals!*



** wherever $\sin x = 0$, $\csc x$ is undefined.*

3. $y = \tan \frac{\pi}{6}x$

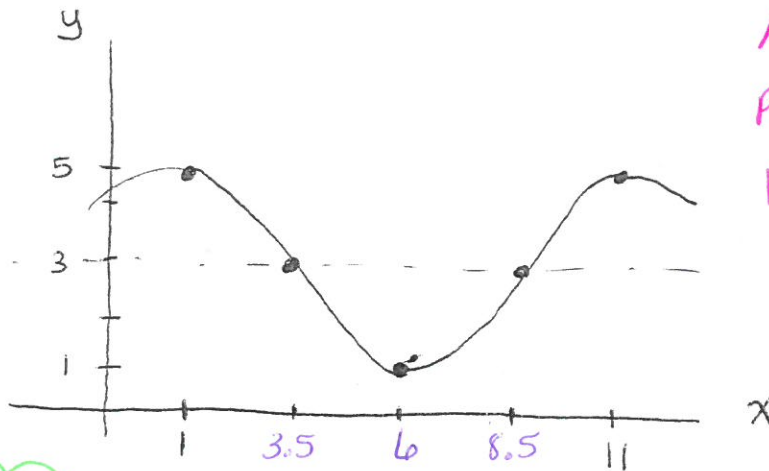


Period: $\pi * hd = \text{period}$

$\pi * \frac{6}{\pi} = \text{per.}$

$6 = \text{period}$

4. write an equation



S.A. = 3

Amp = 2

Ph. Disp = 1

H.D $\Rightarrow 2\pi * hd = \text{period}$

$2\pi * hd = 10$

$hd = \frac{10}{2\pi} \approx \frac{5}{\pi}$

$y = 3 + 2 \cos \frac{\pi}{5} (x-1)$

$y = 3 - 2 \cos \frac{\pi}{5} (x-6)$

$y = 3 + 2 \sin \frac{\pi}{5} (x-8.5)$

$y = 3 - 2 \sin \frac{\pi}{5} (x-3.5)$

Only things that change are the name of the function and the phase disp.

* Must be able to write ALL 4 for any graph.