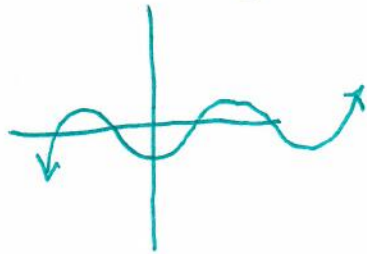


Intro to Trig Graphing

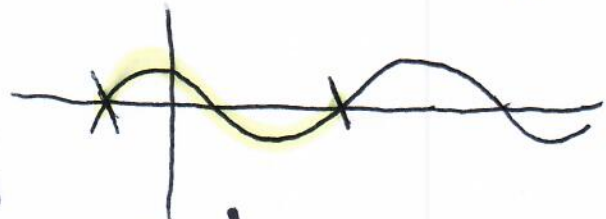
We will be graphing over a radian domain
(x-axis will be measured in radians)

Shape of graph is sinusoidal
(looks like a wave)

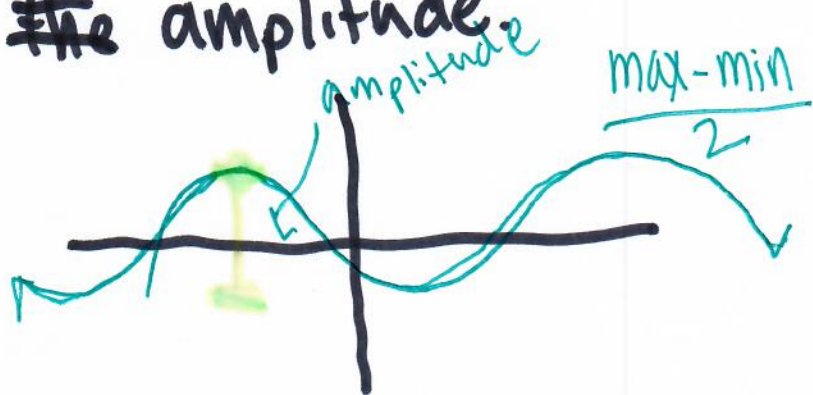


graphs are periodic

↳ period → length of one cycle



have an
graph will ~~the~~ amplitude.



Disect an equation
of a Sine and Cosine
function.

4 main parts : amplitude, period, phase shift,
Vertical Shift.

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

$a \rightarrow$ amplitude (always pos)

$b \rightarrow$ determines the period

$c \rightarrow$ ~~the~~ phase shift

$d \rightarrow$ Vertical shift

↓
horizontal
movement
↓
vertical
movement

Ex: $4 \sin(x - \pi) + 2$

a: 4 b: 1 c: π d: 2

Amp: 4

Period:

PS: right π

VS: up 2

Find amp., ps, vs

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

② $y = 6 \cos(x + 3\pi) + 1$

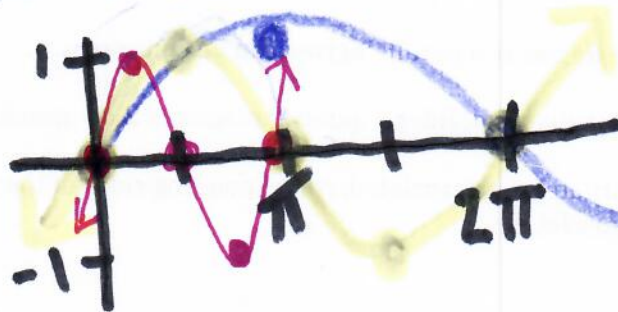
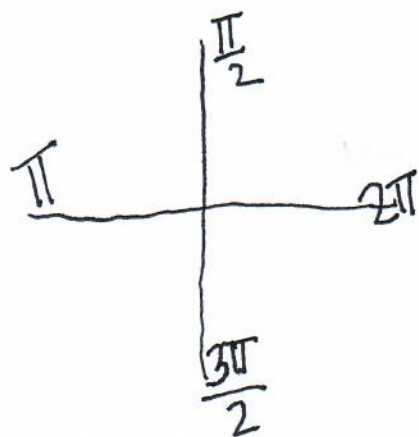
① amp: $\frac{1}{3}$ ps: left $\frac{\pi}{2}$ vs. down 4

② amp: 6 ps: left 3π vs up 1

explore the period

$y = \sin x$

period is 2π



$\sin 0 = 0$

$\sin \frac{\pi}{2} = 1$

$\sin \pi = 0$

$\sin \frac{3\pi}{2} = -1$

period π

$y = \sin 2x$

$y = \sin \frac{1}{2}x$

Find the amplitude,
period, phase shift, and
vertical shift of...

a) $\frac{1}{2} \sin(2(x-2\pi)) + 3$ Amp: $\frac{1}{2}$ p.s. right 2π
 Per: $\frac{2\pi}{2} = \pi$ v.s. V_p 3

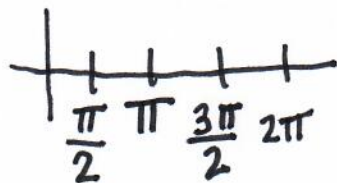
b) $4 \cos(\frac{1}{3}(x + \frac{\pi}{2})) - 4$ Amp: 4 p.s. left $\frac{\pi}{2}$
 Period: $\frac{2\pi}{1/3} = 6\pi$ v.s. down 4

Setting up the graph.

- ① determine the 4 key elements
- ② set up an ~~appropriate~~ appropriate scale for x & y axis.

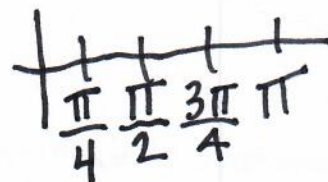
Ex) Period: 2π

$$\frac{2\pi}{4} = \frac{\pi}{2}$$



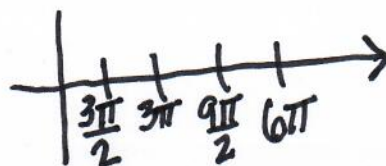
$$\frac{2\pi}{2}$$

Ex) Period π



$$\frac{2\pi}{4}$$

ex) Period: 6π



$$\frac{6\pi}{4}$$

$$\frac{3\pi}{2} + \frac{3\pi}{2} = \frac{6\pi}{2}$$

$$\frac{2\pi}{6}$$

$$\frac{2\pi}{2}$$

$$\frac{2\pi}{3}$$

~~$$y = 2(x - \frac{\pi}{2})$$~~

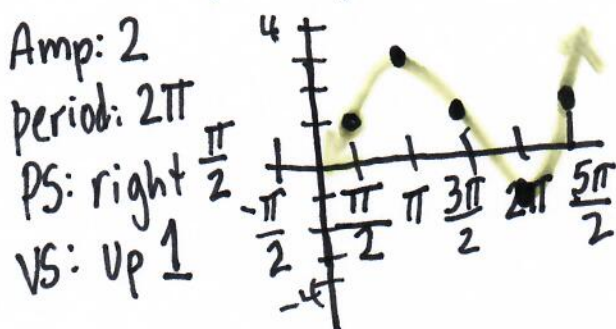
$$y = 2 \sin(x - \frac{\pi}{2}) + 1$$

Amp: 2

period: 2π

PS: right $\frac{\pi}{2}$

VS: up 1



$$\sin 0 = 0$$

$$y = \frac{1}{2} \cos\left(\frac{1}{4}(x + 6\pi)\right)$$

Amp: $\frac{1}{2}$ period: 8π

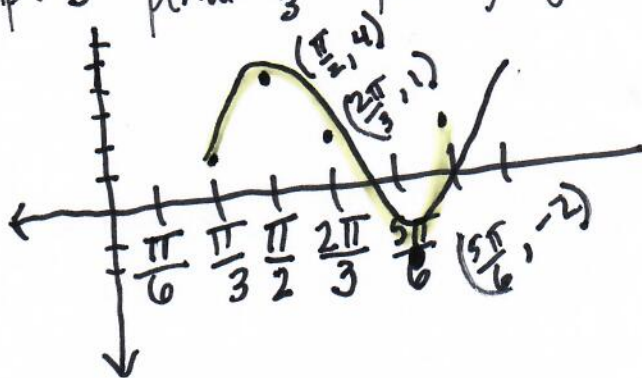
PS: left 6π



$$\cos 0 = 1$$

$$y = 3 \sin\left(3\left(x - \frac{\pi}{3}\right)\right) + 1$$

Amp: 3 period: $\frac{2\pi}{3}$ PS: right $\frac{\pi}{3}$ VS: up 1



$$\frac{2\pi}{6} = \frac{\pi}{3}$$

$$\frac{\pi}{6} + \frac{\pi}{6} = \frac{2\pi}{6}$$

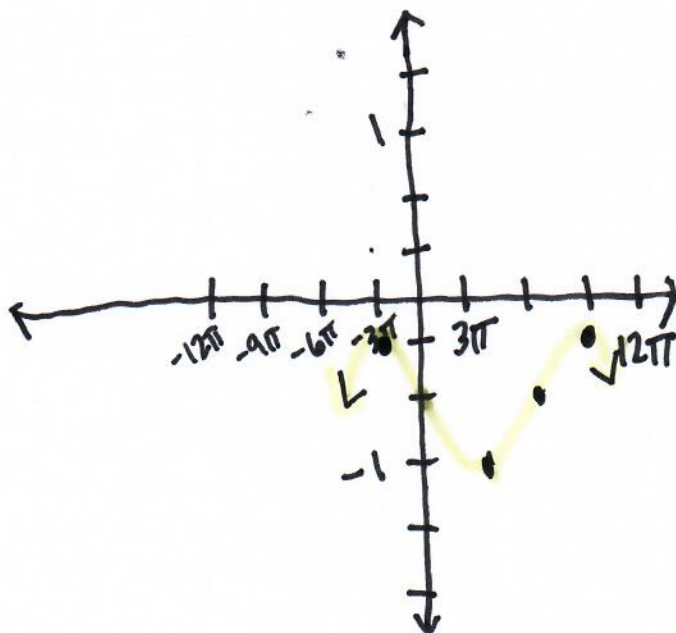
$$y = \frac{1}{3} \cos\left(\frac{1}{6}(x+3\pi)\right) - \frac{2}{3}$$

Amp: $\frac{1}{3}$

Period: 12π

ps: left 3π

vs: down $\frac{2}{3}$



5 main points

$$(-3\pi, -\frac{1}{3})$$

$$(0, -\frac{2}{3})$$

$$(3\pi, -1)$$

$$(6\pi, -\frac{2}{3})$$

$$(9\pi, -\frac{1}{3})$$

Practice: ① $y = 2\sin\left(6\left(x - \frac{\pi}{4}\right)\right)$

② $y = \cos\left(\frac{1}{8}(x+4\pi)\right) + 2$