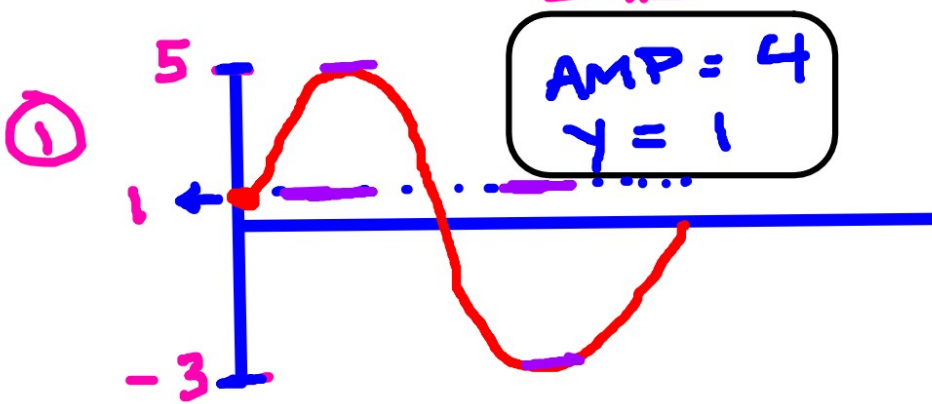


$$\frac{5 + (-3)}{2} = \frac{2}{2} = 1 \text{ DRILL}$$



What is the amplitude & the equation of the midline?

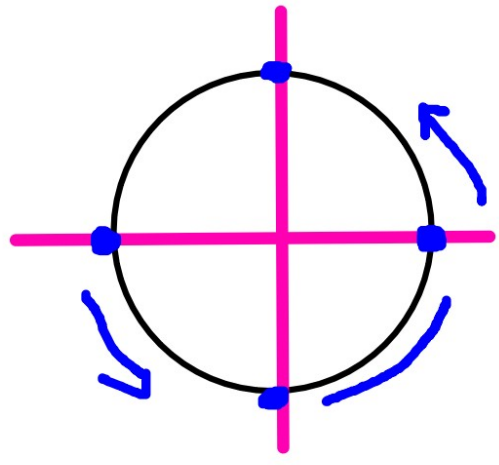
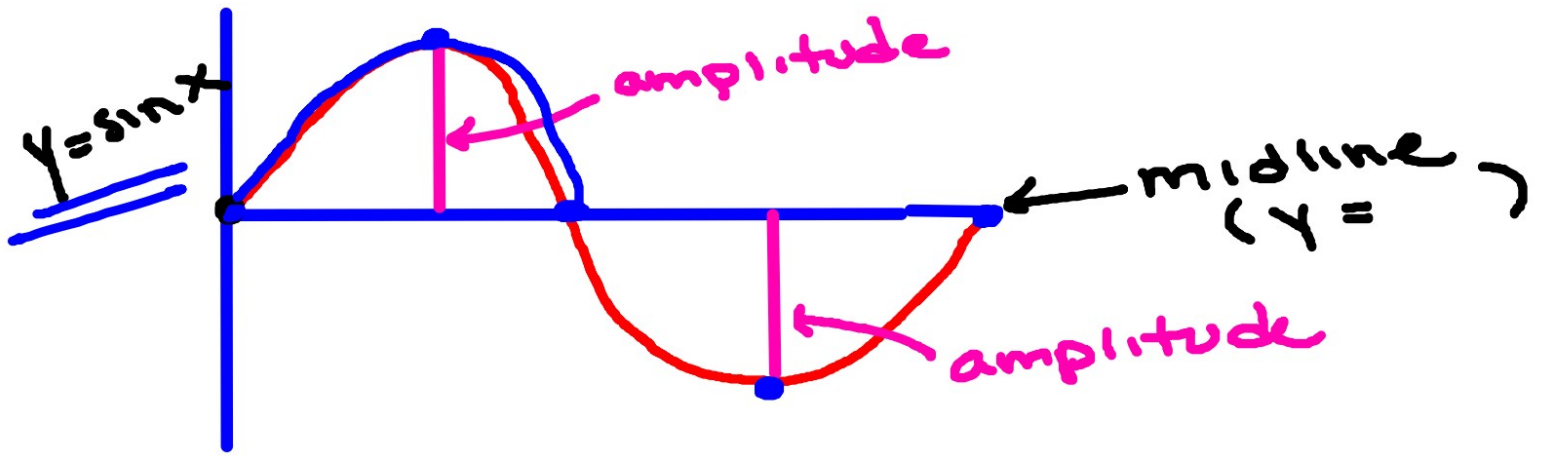
②

$$y = 4 \sin(x) - 3$$

midline $y = -3$ \uparrow down 3

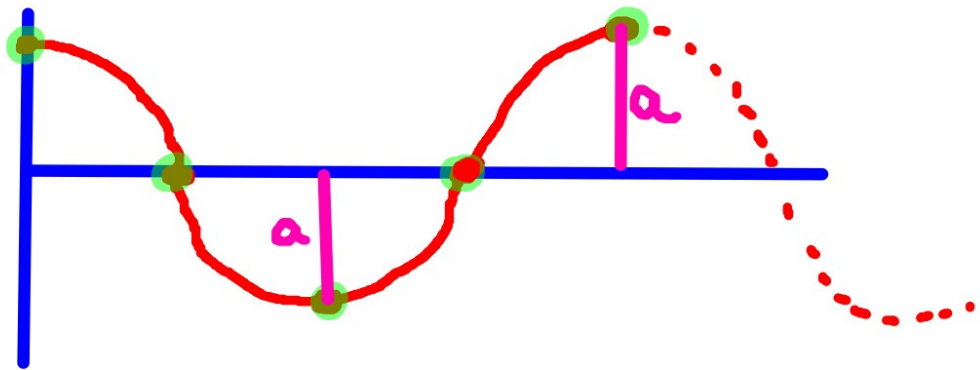
← amplitude = 4

What is the amplitude & the equation of the midline?

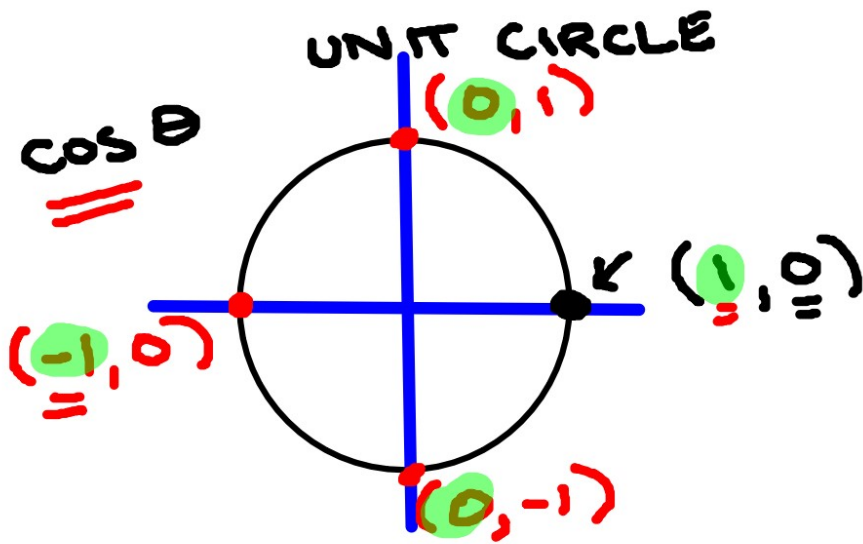


$$y = \sin x$$
$$x = \cos x$$

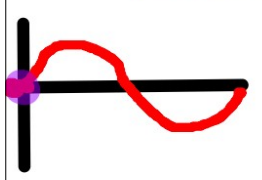
$y = \cos x$



$x = \cos \theta$

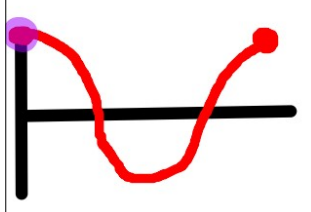


General Equations



$$y = a \sin (bx \pm d) \pm c$$

left/right up/down



$$y = a \cos (bx \pm d) \pm c$$

↑
amplitude

↑
left
right

↑
mid
line
y =

Ex: $b=2$

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

MAX: -2

* amplitude is: 3 MIN: -8

* midline is: $y = -5$

shifted left " π " units

*

$f(x) + c$	up	$f(x - c)$	right
$f(x) - c$	down	$f(x + c)$	left

* PERIOD IS: $\frac{2\pi}{2} = \pi$

Ex. * $y = \overset{\text{flips}}{\downarrow} -5 \cos(4x - \frac{\pi}{2}) + 4$

$b = 4$

Amplitude is: 5

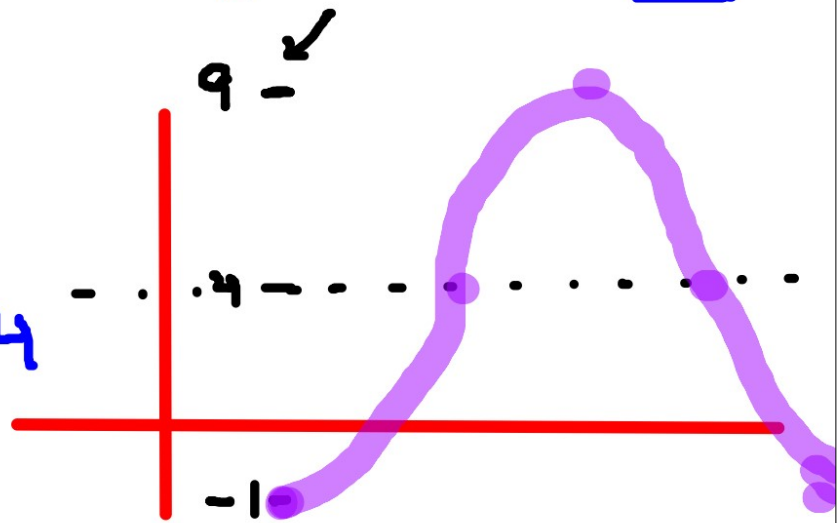
Midline is: $y = 4$

Max is: 9

Min is: -1

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

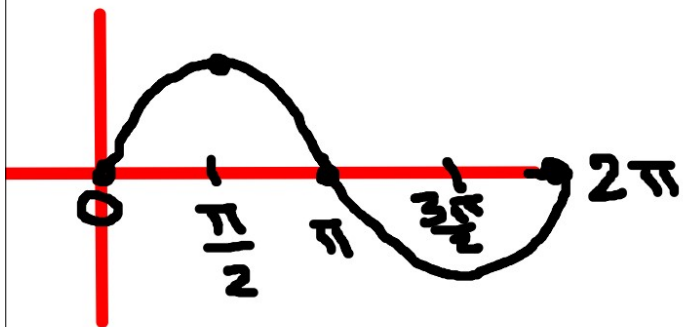
Horizontal Shift: Right $\frac{\pi}{2}$



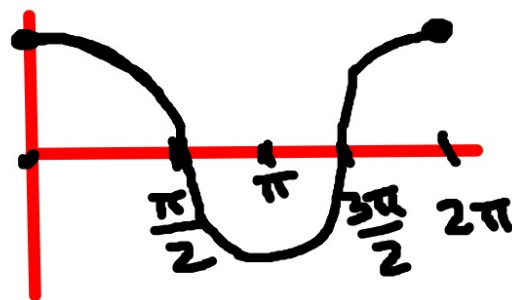
Period of a Sin or Cos graph

* In general the period is 2π .

(Length of one cycle)



$$y = \sin x$$



$$y = \cos x$$

The **period** for **$\sin x$ & $\cos x$** functions

is:

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

$$y = a \sin(bx + d)$$

$$y = a \cos(bx + d)$$