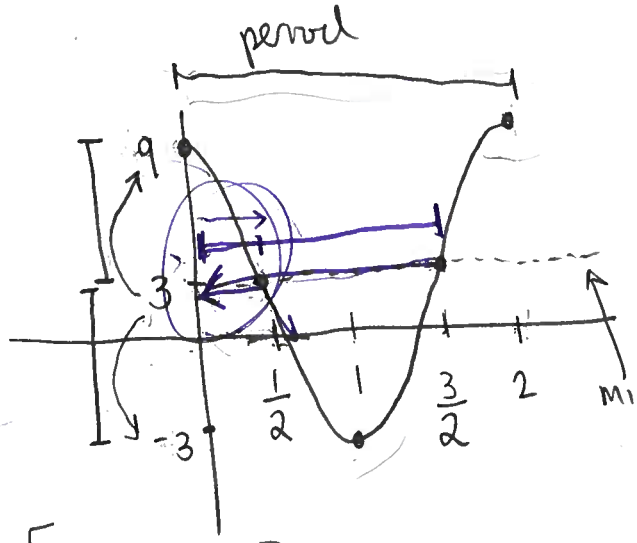
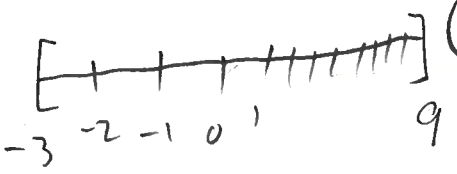
Ex:





Average of peak + valley

$= \frac{9+(-3)}{2}$

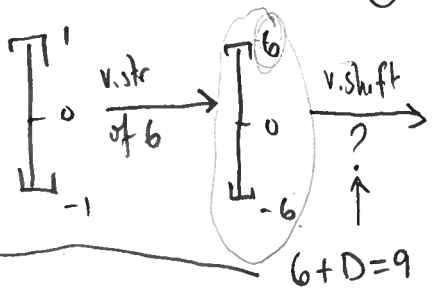
$= 3$

Amplitude

$A = 6$

V. Shift

$D = 3$



$6 + D = 9$

$D = 9 - 6$

$= 3$

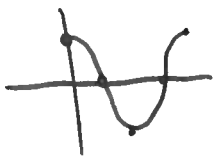
period change

"normal" per: 2π

we have period: 2

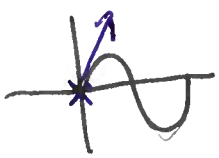
$\text{Actual Per} = \frac{2\pi}{B}$

$2 = \frac{2\pi}{B} \rightarrow \frac{1}{2} = \frac{B}{2\pi} \rightarrow \frac{2\pi}{2} = B \rightarrow \boxed{B = \pi}$



as cosine: given graph already starts at peak y-value ⇝ no ~~h shift~~ phase shift here → $\boxed{C = 0}$

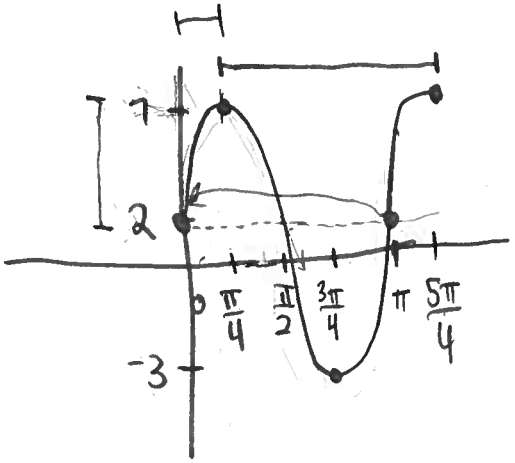
$$\boxed{6\cos(\pi x) + 3}$$



as sine: given graph needs to be phase shifted → $\boxed{C = \frac{3}{2}}$

$$\boxed{6\sin\left(\pi\left(x - \frac{3}{2}\right)\right) + 3}$$

EX:



midline

$\frac{7+(-3)}{2} = \frac{4}{2} = 2 = D$

Amplitude

$2+A=7$

$2-A=-3$

$A=5$

period

$\frac{5\pi}{4} - \frac{\pi}{4} = \frac{4\pi}{4} = \pi$

$\pi = \frac{2\pi}{B} \rightarrow \frac{1}{\pi} = \frac{B}{2\pi}$

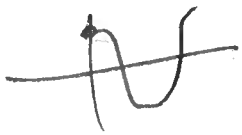
(π = actual per)

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

phase shift

as sine: no phase shift — graph starts at midline + goes up already — $C=0$

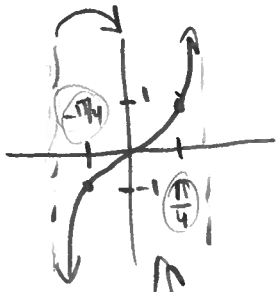
$5\sin(2(x-0))+2$

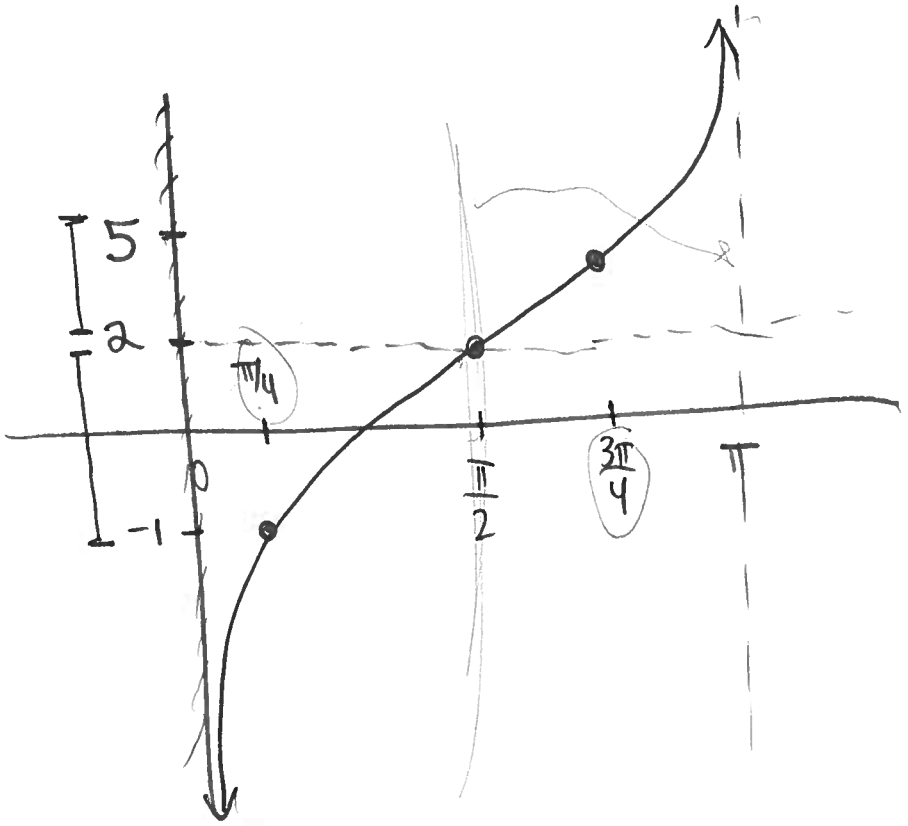


as cosine: cosine shifted right by $\frac{\pi}{4}$ to get given graph → $C=\frac{\pi}{4}$ ← phase shift

$5\cos(2(x-\frac{\pi}{4}))+2$

Ex:





Midline

$D = 2$

"Amplitude" (not really applicable term for tan)

$A = 3$

period — distance b/w asymptotes

given picture $\sim \pi$ $\sim$ usual period of tan $\rightarrow$ $\boxed{B = 1}$

"phase" shift

here the "usual" asymptote at $-\frac{\pi}{2}$ seems to have been moved right by $\frac{\pi}{2}$

$\Rightarrow \boxed{C = \frac{\pi}{2}}$

$\rightarrow 3\tan\left(x - \frac{\pi}{2}\right) + 2$