

Vertical Shift - the vertical displacement in a graph. This movement is either up (+) or down (-).

Period - the number of degrees or radians it takes to complete one cycle. To find the period, divide 360 by B (degrees) or 2π by B (radians)

Interval - can be found by dividing the result by 4

$$y = C + A \sin B(\theta \pm D)$$

Amplitude - the distance from the axis (horizontal center) of the graph to a high or low point. Find this distance by taking the absolute value of A.

Reflection - if A is negative, then the parent has been reflected over the x-axis.

Phase Shift - the horizontal displacement in a graph. This movement is either left (+) or right (-)

Any Trig Function

$$y = C + A \sin B(\theta \pm D)$$

Steps to Graph:

1. C: Vertical Shift: Draw a new horizontal line through C.
2. A: Amplitude: From C go up and down A units, placing marks on the y-axis.
3. D: Horizontal Shift: Place a mark on the x-axis at D from the starting point.
4. B: Determines the period, the period determines the interval. Divide the Period by 4 to find the interval. (5 marks total).

1. $y = 3 \sin(t)$

$A = 3$

$B = 1$

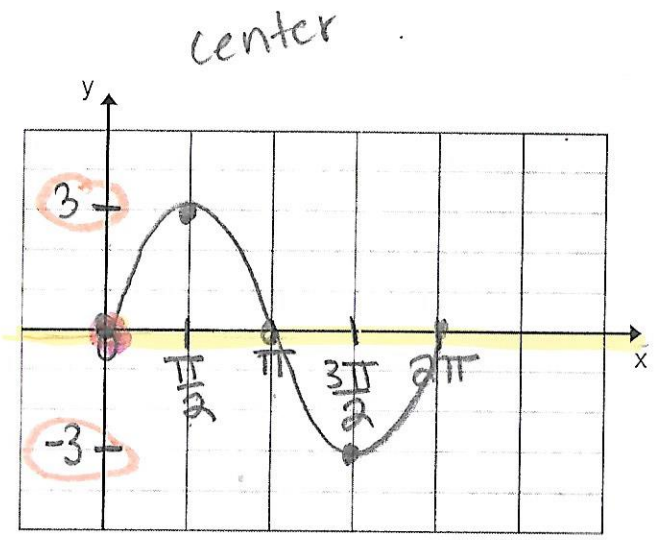
outside $C = 0$

inside $D = 0$

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

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

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



2. $y = \sin 2(t)$

$A = 1$

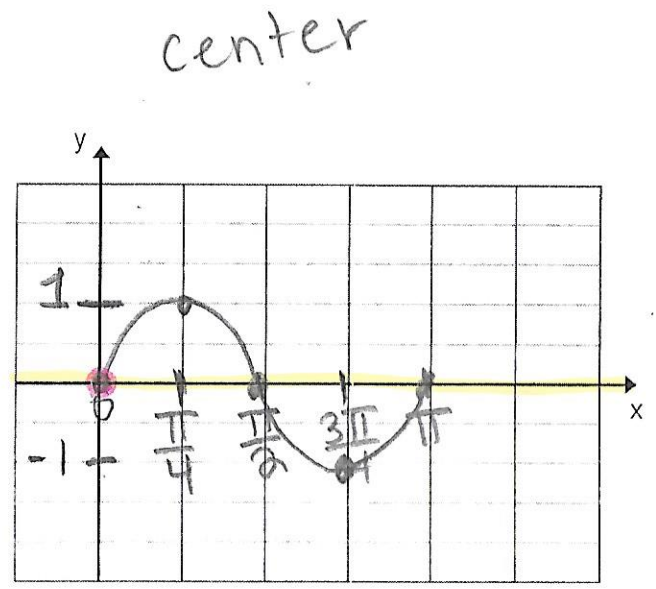
$B = 2$

$C = 0$

$D = 0$

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

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



3. $y = 3 - 2\cos(t)$

$A = -2$, $|A| = 2$

$B = 1$

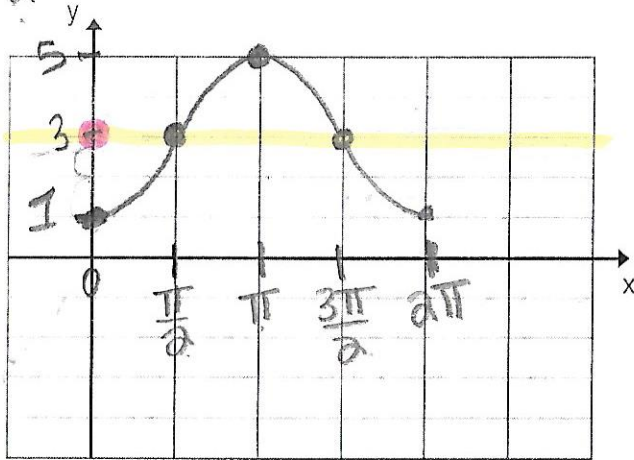
$C = +3$

$D = 0$

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

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

max/min



center

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

$A = +1$

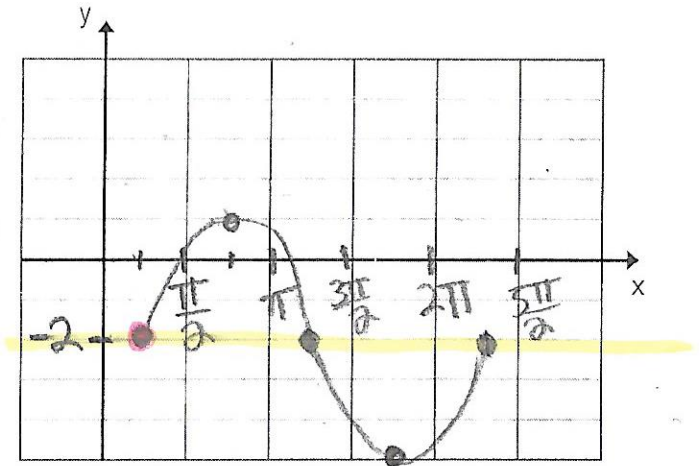
$B = 1$

$C = -2$

$D = -\frac{\pi}{4}$ R

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

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



4. $y = \cos(t - \frac{\pi}{2})$

$A = 1$

$B = 1$

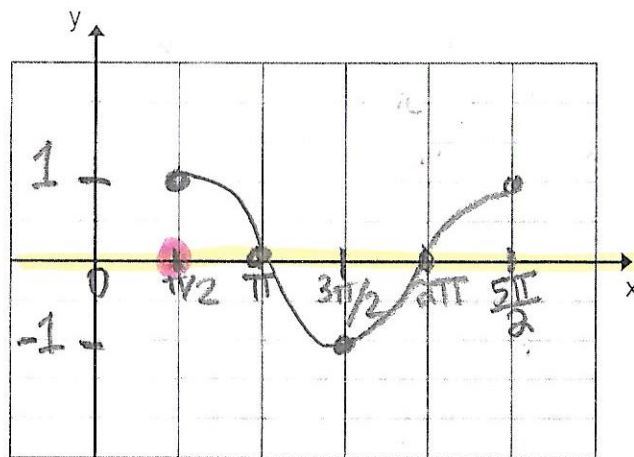
$C = 0$

$D = -\frac{\pi}{2}$ R

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

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

max/min



max/min

6. $y = 4\cos(\frac{1}{2}(t + \frac{\pi}{2}))$

$A = 4$

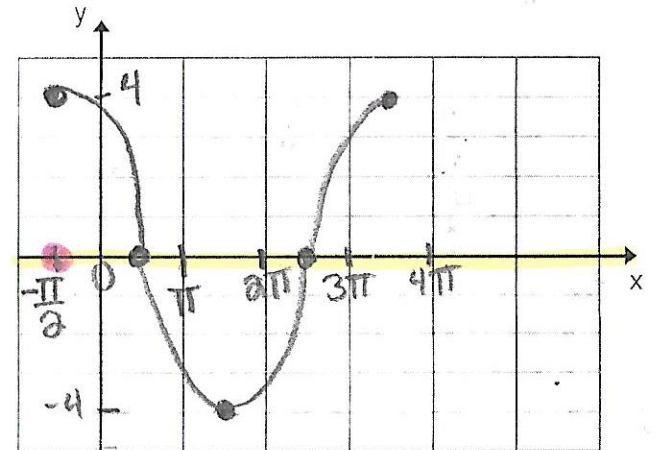
$B = 1/2$

$C = 0$

$D = +\pi/2$

Per = $\frac{4\pi}{1}$

Int = π



center

7. $y = -2 - 3 \sin 2(t - \frac{\pi}{4})$

$A = -3$

$B = 2$

$C = -2$

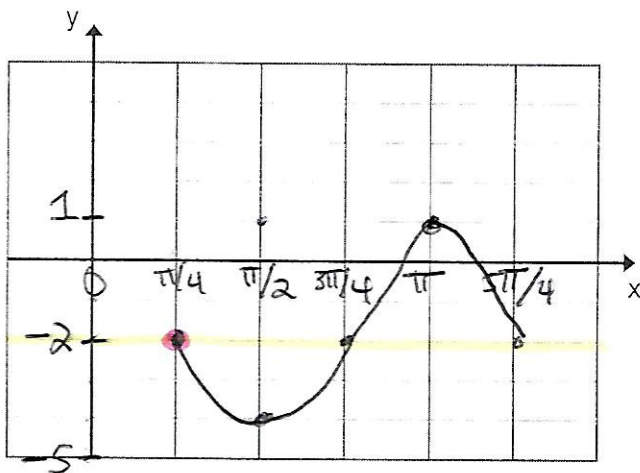
$D = -\frac{\pi}{4} R$

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

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

$\frac{\pi}{4}$

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



8. $y = 1 + 4 \cos \frac{1}{2}(t + \frac{\pi}{2})$

$A = 4$

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

$C = 1$

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

Per = 4π

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

$\frac{2\pi}{5 \cdot 1/2}$

