

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

(a) Period = $\frac{2\pi}{b}$ so ... $\frac{2\pi}{\frac{1}{2}} = \underline{\underline{4\pi}}$

(b) Equation of the sinusoidal axis $y = d$
 $y = -2$

(c) amplitude a 2

(d) Range $\min \leq y \leq \max$

(e) Phase shift c $\frac{1}{2}\pi \leftarrow$

$\begin{matrix} \min & & \max \\ -2-2 & & -2+2 \\ -4 \leq y \leq & & 0 \end{matrix}$

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

amp = 2

Range $-4 \leq y \leq 0$

P.S. $\frac{\pi}{2}$

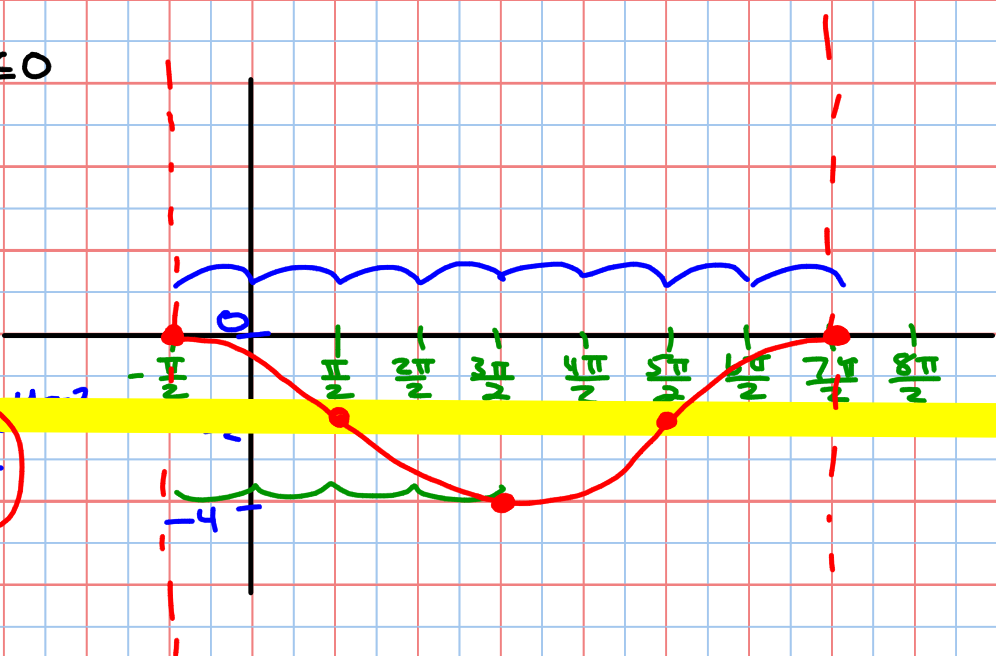
Period 4π

S.A. $y = -2$

P.S. $\frac{\pi}{2}$

Period 4π

$\frac{8\pi}{2}$



$$y = 3 \sin 2(x - \frac{\pi}{6}) + \underline{\underline{5}} \begin{matrix} \uparrow 3 \\ \downarrow 3 \end{matrix}$$

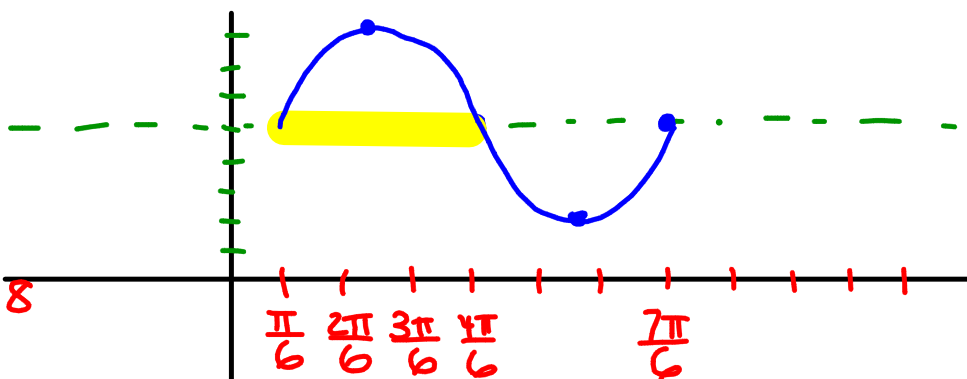
S.A. : $y = 5$

P.S. : $\frac{\pi}{6} \rightarrow$

amp: 3

Period: π

Range : $2 \leq y \leq 8$

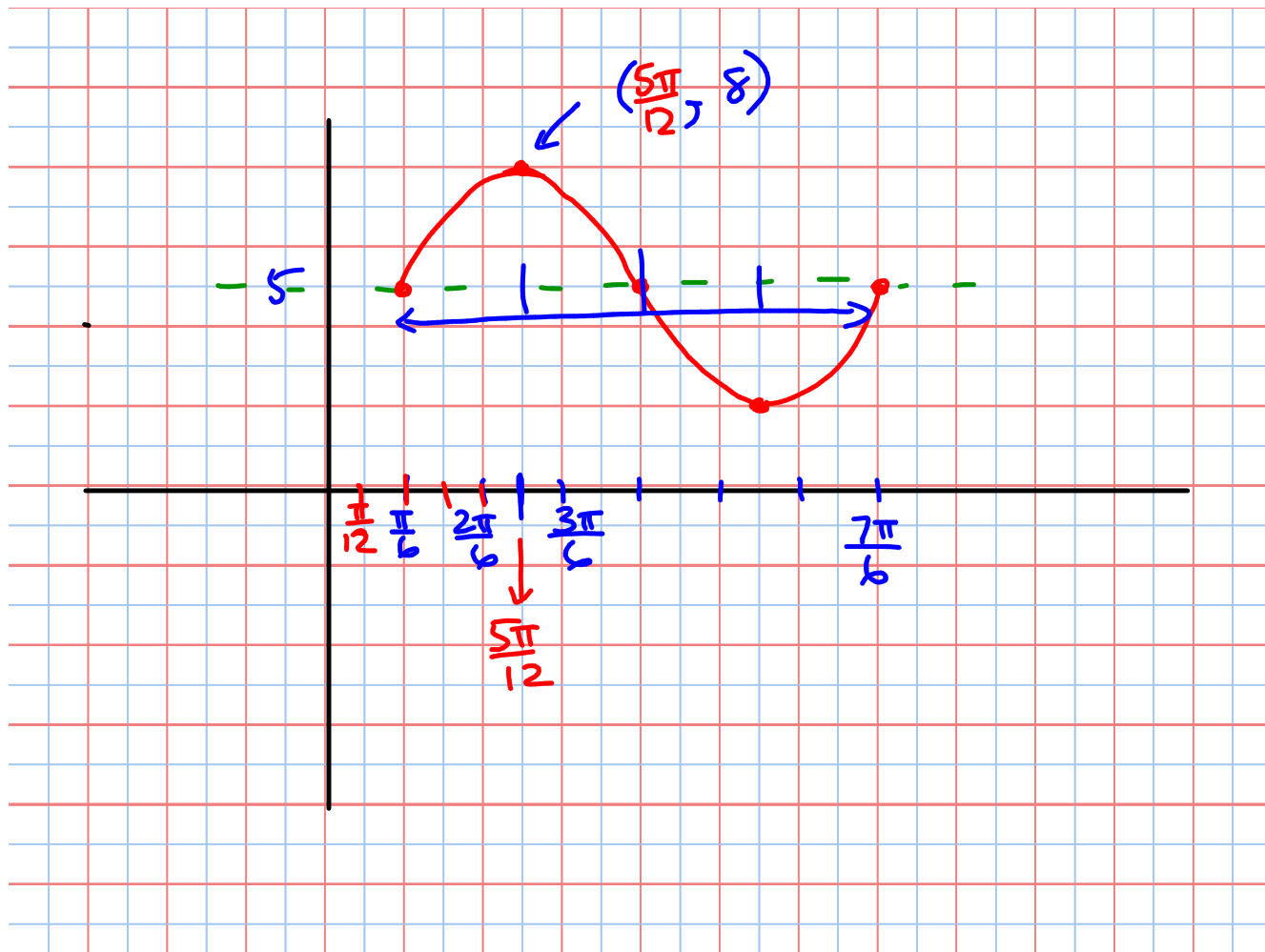


Phase Shift
 $\frac{\pi}{6}$

Period
 $\frac{6\pi}{6}$

start at $\frac{\pi}{6}$ end at $\frac{7\pi}{6}$

- STEPS
- ① Write the Phase Shift & period with the same denominator \Rightarrow figure out an easy scale
 - ② Mark the S.A.
 - ③ Mark your start & end points + fill in the rest



$$y = 3 \sin\left(\frac{\pi}{6}x\right) + 6$$

$\uparrow^3 \quad 9$
 $\downarrow_3 \quad 3$

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

$$2\pi \times \frac{6}{\pi} = 12$$

P.S.: None

Period: 12

S.A.: $y = 6$

Range: $3 \leq y \leq 9$

Amplitude: 3

