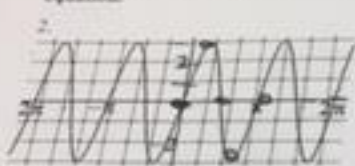


Part 1: Given the equation find the amplitude, period, vertical shift and phase shift.

1)  $y = 2 \sin 4(x - \frac{\pi}{4}) + 3$       Amplitude: 2  
 Period:  $\frac{2\pi}{4} = \frac{\pi}{2}$       Phase Shift:  $R + \frac{\pi}{4}$       Vertical Shift: up 3

Part 2: Given the graph find the amplitude, period, vertical shift and phase shift. Then write the equation.



Amplitude: 3      Phase shift: None  
 Vertical shift: None      Period: ~~pi~~  $2\pi$

Sine Equation:  $y = 3 \sin 2x$

3. The table shows the height of a spring in cm after x seconds.

seconds	0	2	5	8	10	12	15	16	18	20	21	23
Height	1.0	3.2	6.2	10.4	9.5	6.8	3.4	1.2	3.6	6.5	8.4	10.0

- a) Find a sine equation for that gives height as a function of time.  $y = 4.2 \sin(.41x + 1.89) + 6.17$
- b) What is the period for this function?  $\frac{2\pi}{.41} \rightarrow 15.32$
- c) Use your equation to predict what the height will be in 1 minute. 3.39
- d) What is the average height of the spring? 6.17
- e) What is the max and min height of the spring?  

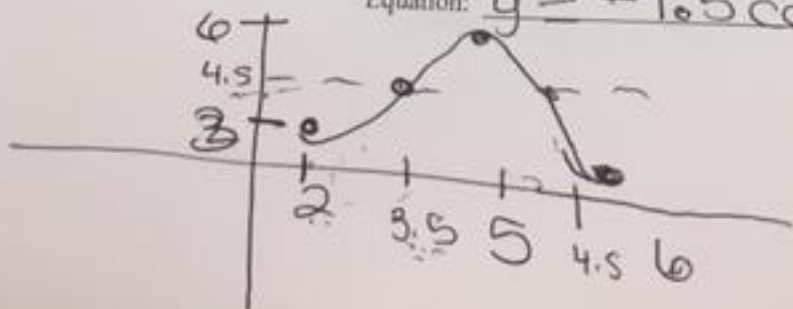
$$\begin{array}{r} 6.17 \\ + 4.21 \\ \hline 10.38 \end{array} \quad \begin{array}{r} 6.17 \\ - 4.21 \\ \hline 1.96 \end{array}$$

4. The zebra on the carousel has a minimum height of 3 feet at 2 minutes and 6 feet at 5 minutes. Find:

$(2, 3)$   $(5, 6)$

Amplitude: 1.5      Vert. Shift: up 4.5      Period: 4      Phase Shift:  $R + 2$

Equation:  $y = -1.5 \cos \frac{\pi}{2}(x-2) + 4.5$



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