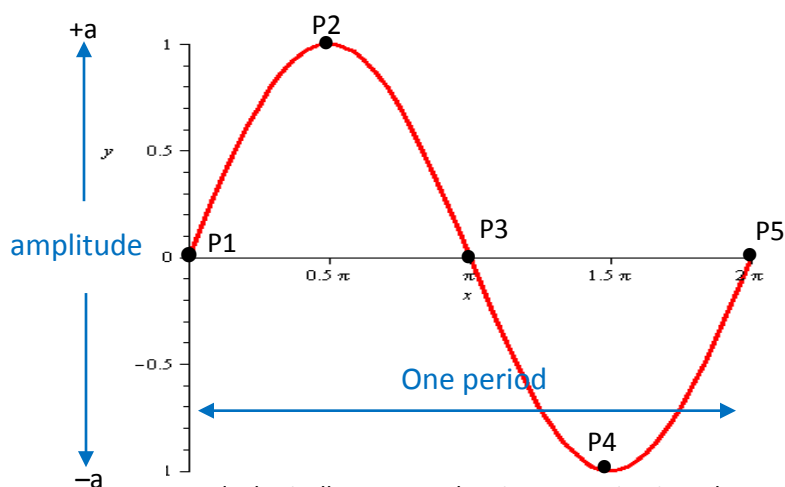


SINE GRAPH



General Form:

$$y = a \sin b(x - h) + k$$

Amplitude: $|a|$

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

Horizontal shift: $h\pi$

Vertical shift: k

1: Algebraically, arrange the given equation into the general simplified form: $y = a \sin b(x)$

Or Complex form: $y = a \sin b(x - h) + k$

Step 2: By inspection, identify the amplitude (a), phase shifts ($h\pi$), period (b), and vertical shift (k).

Step 3: Plot the following five points:

Point 1: (h, k)

Point 2: $(h + \frac{\pi}{2b}, a + k)$

Point 3: $(h + \frac{\pi}{b}, k)$

Point 4: $(h + \frac{3\pi}{2b}, -a + k)$

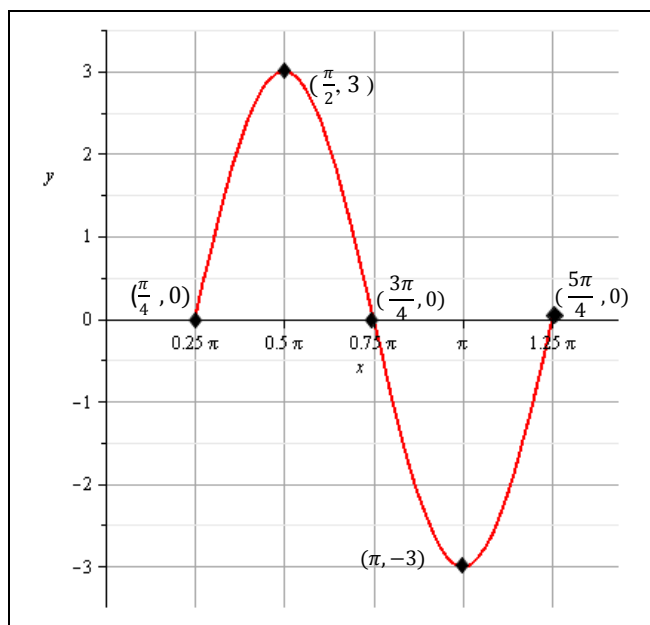
Point 5: $(h + \frac{2\pi}{b}, k)$

EXAMPLE: Given $y = 3 \sin(2x - \frac{2\pi}{4})$, graph the sine function.

Step 1: By factoring out a 2 within the $\sin(_)$, we get an equation in the general form: $y = 3 \sin 2(x - \frac{\pi}{4})$

Step 2: By inspection: $a = 3$; $b = 2$;
 $h = \frac{\pi}{4}$; $k = 0$;

$$\text{Period} = \frac{2\pi}{b} = \frac{2\pi}{2} = \pi$$



Step 3: Plot P1: $(\frac{\pi}{4}, 0)$ P2: $(\frac{\pi}{2}, 3)$ P3: $(\frac{3\pi}{4}, 0)$ P4: $(\pi, -3)$ P5: $(\frac{5\pi}{4}, 0)$