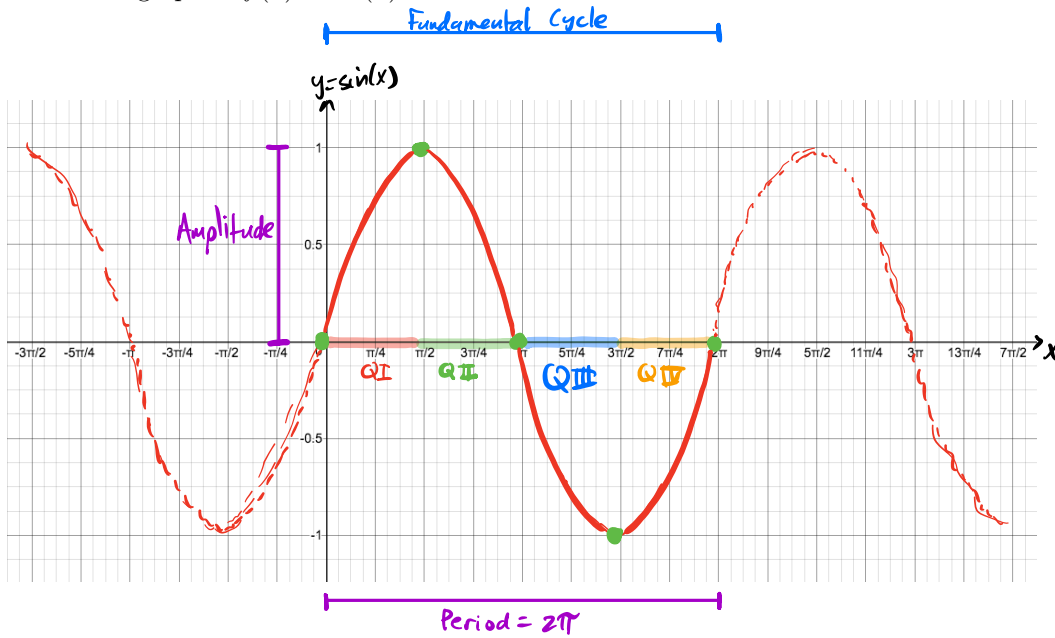


§1.5 (part 1): Graphs of Sine & Cosine

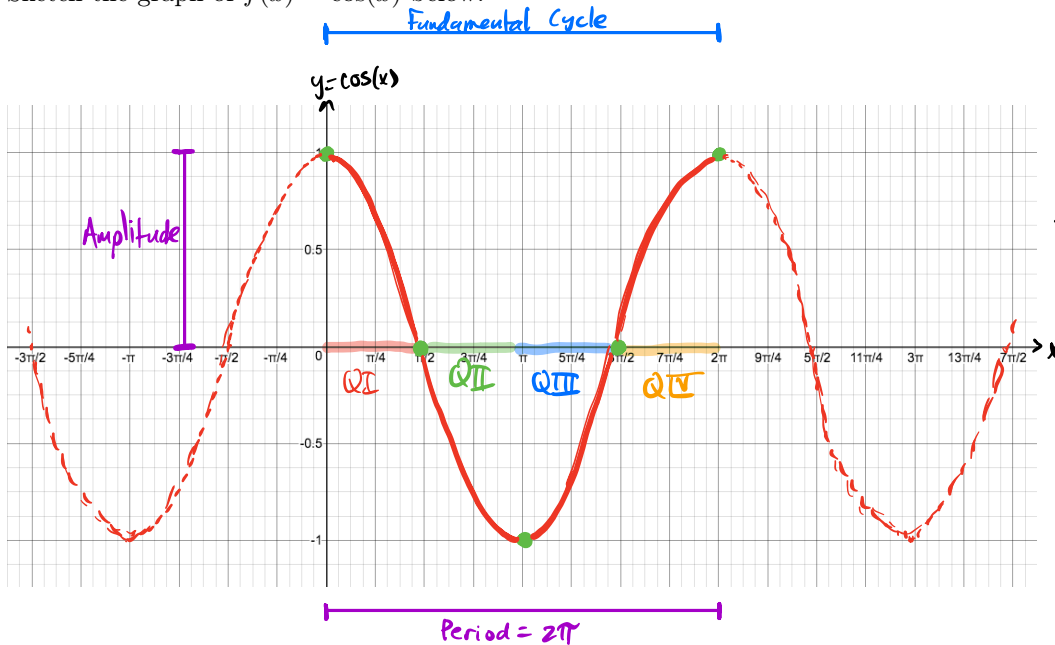
1.] Sketch the graph of $f(x) = \sin(x)$ below:



Domain: $(-\infty, \infty)$
 Range: $[-1, 1]$

Five key Points: $(0, 0)$ $(\pi/2, 1)$ $(\pi, 0)$ $(3\pi/2, -1)$ $(2\pi, 0)$

2.] Sketch the graph of $f(x) = \cos(x)$ below:



Domain: $(-\infty, \infty)$
 Range: $[-1, 1]$

Five key Points: $(0, 1)$ $(\pi/2, 0)$ $(\pi, -1)$ $(3\pi/2, 0)$ $(2\pi, 1)$

3.] Sketch the graph of $f(x) = \sin(x - \frac{\pi}{3})$

$a=1$

$b=1$

$C = \frac{\pi}{3}$

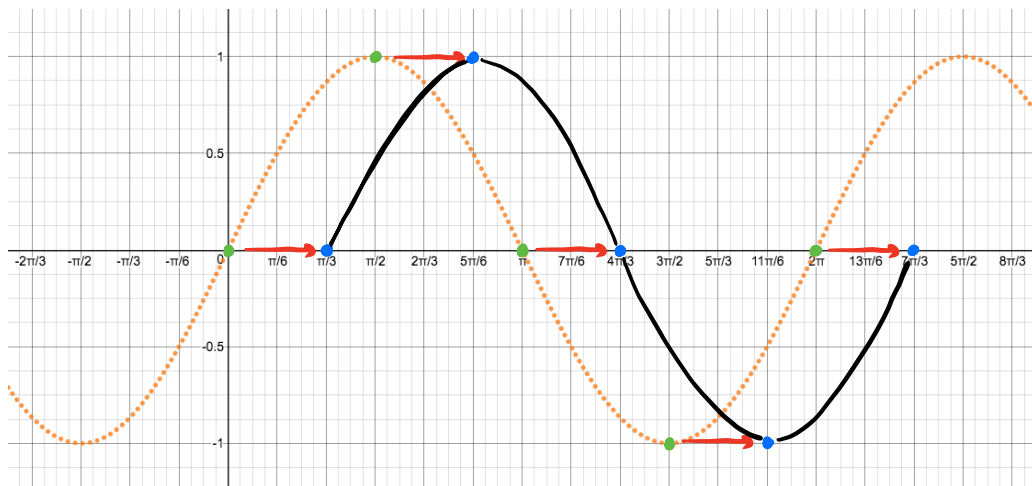
$d=0$

Amplitude = $|a| = |1| = 1$

Period = $\frac{2\pi}{b} = \frac{2\pi}{1} = 2\pi$

Phase Shift: Right shift

No Vertical Shift



Fundamental Cycle → starts at $x = \frac{c}{b} = \frac{\pi/3}{1} = \pi/3$

↳ Ends at $x = \frac{2\pi + c}{b} = \frac{2\pi + \pi/3}{1} = \frac{6\pi}{3} + \frac{\pi}{3} = \frac{7\pi}{3}$

4.] Sketch the graph of $f(x) = 2 \cos(\pi x + \frac{\pi}{2})$

$a=2$

$b=\pi$

$C = -\pi/2$

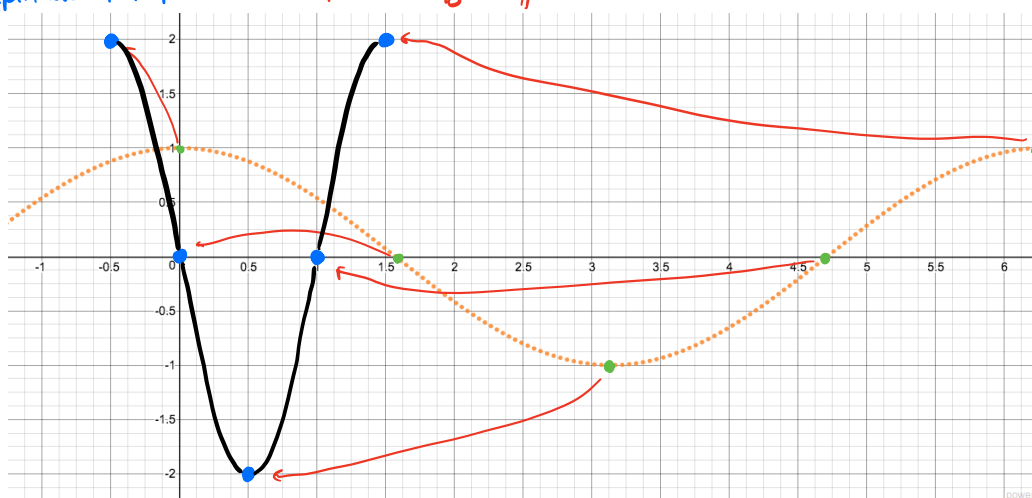
$d=0$

Amplitude = $|a| = |2| = 2$

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

Phase Shift: Left shift

No Vertical Shift



Fundamental Cycle → starts at $x = \frac{c}{b} = \frac{-\pi/2}{\pi} = -\frac{\pi}{2} \cdot \frac{1}{\pi} = -\frac{1}{2} \rightarrow$ first key point: $(-\frac{1}{2}, 2)$

↳ ends at $x = \frac{2\pi + c}{b} = \frac{2\pi + (-\pi/2)}{\pi} = \frac{2\pi - \pi/2}{\pi} = \frac{4\pi - \pi}{2\pi} = \frac{3\pi}{2\pi} = \frac{3}{2} \rightarrow$ Last key point $(\frac{3}{2}, 2)$