TRIGONOMETRIC GRAPHS: SINE AND COSINE

$y = A \sin B(x - h) + k$ or $y = A \cos B(x - h) + k$

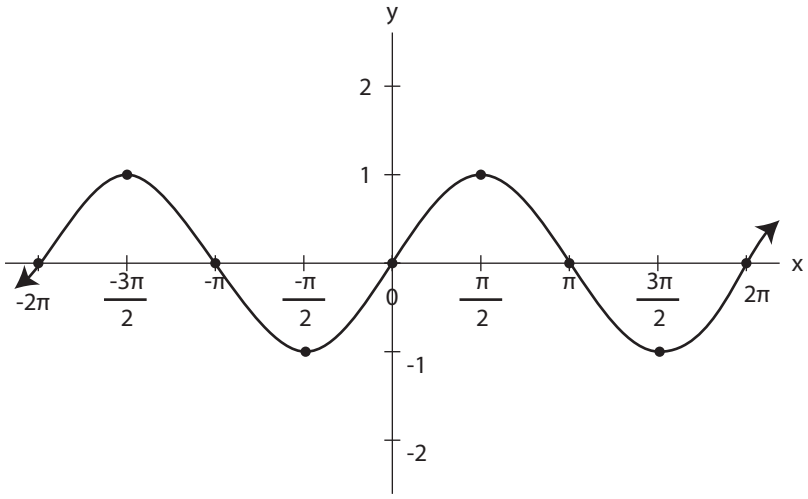
A = amplitute
B = effects the perior (length of one complete wave)

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

x = h: phase shift (horizontal shift)
y = k: center line (vertical shift) ; half the wave is above this line and half is below

1. $y = \sin x$

A = 1
B = 1
Period = 2π
x = h: x = 0
y = k: y = 0



2. $y = -3 \sin 2\left(x - \frac{\pi}{4}\right) + 1$

A = 3
B = 2

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

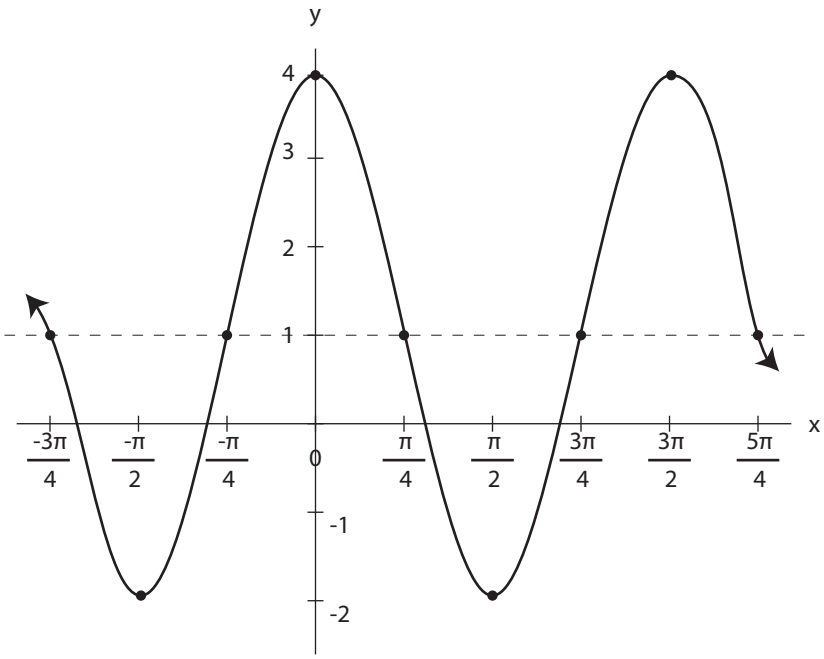
$$x = h: x = \frac{\pi}{4}$$

y = k: y = 1

Graphing Window:
- period ≤ (x - h) ≤ period

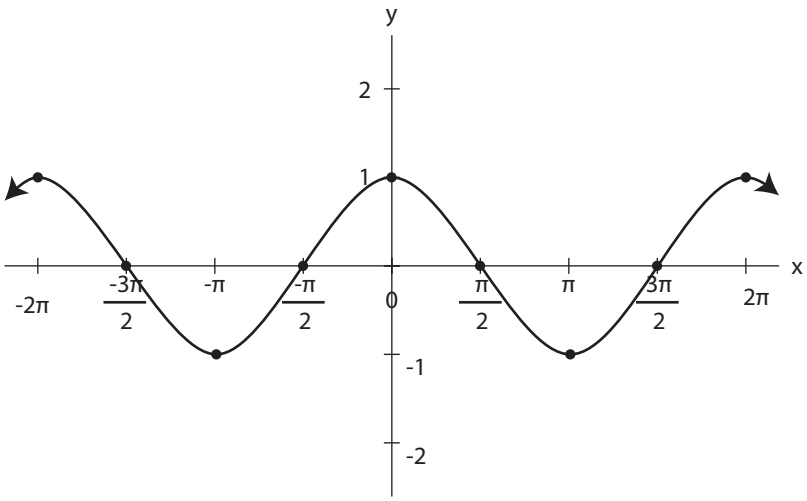
$$-\pi \le x - \frac{\pi}{4} \le \pi$$

$$-\frac{3\pi}{4} \le x \le \frac{5\pi}{4}$$



3. $y = \cos x$

A = 1
B = 1
Period = 2π
x = h: x = 0
y = k: y = 0



2. $y = 2 \cos 3 \left(x + \frac{\pi}{6}\right) - 1$

A = 2
B = 3

Period = $\frac{2\pi}{3}$

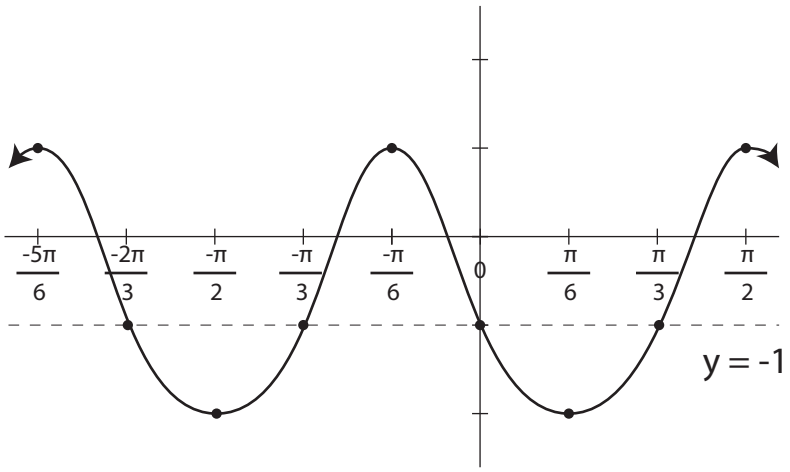
x = h: x = $-\frac{\pi}{6}$

y = k: y = -1

Graphing Window:
- period ≤ (x - h) ≤ period

$-\frac{2\pi}{3} \leq x + \frac{\pi}{6} \leq \frac{2\pi}{3}$

$-\frac{5\pi}{6} \leq x \leq \frac{\pi}{2}$



Note: to find x-axis values, just take the average :)