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

a ⟶ Amplitude - Vert strecth or shrink

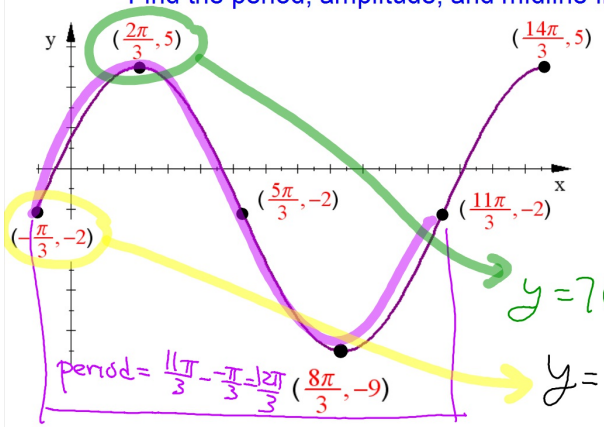
b ⟶ Leads to the Period = 2π/b - Horiz stretch or shrink

h ⟶ Phase Shift - Horiz translation - gives the "new" starting point

k ⟶ Equation of the Midline - Vert translation

Write the equation of this graph as both a Sine and a Cosine Function

Find the period, amplitude, and midline first



Amp = 7

Period $\frac{12\pi}{3} = 4\pi$

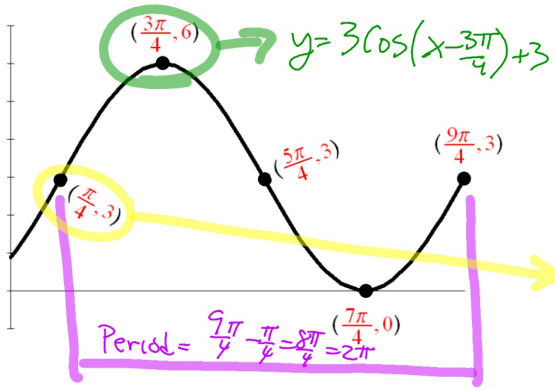
$b = \frac{2\pi}{4\pi} = \frac{1}{2}$

midline $y = -2$

$y = 7\cos(\frac{1}{2}(x - \frac{2\pi}{3})) - 2$

$y = 7\sin(\frac{1}{2}(x + \frac{\pi}{3})) - 2$

Write both a Sin and a Cos equation for this graph.



$y = 3\cos(x - \frac{3\pi}{4}) + 3$

Amp = 3

midline $y = 3$

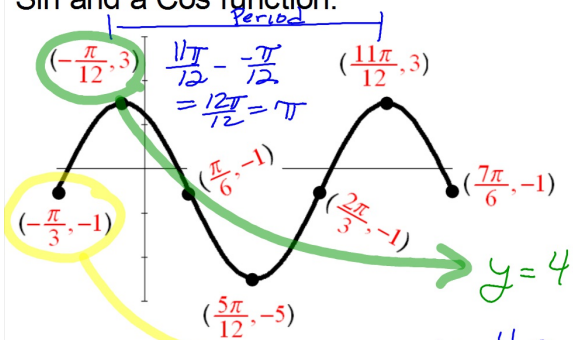
period $= 2\pi$

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

midline $y = 3$

$y = 3\sin(x - \frac{\pi}{4}) + 3$

Write the equation of this graph as both a Sin and a Cos function.



Amp = 4

midline $y = -1$

period $= \pi$

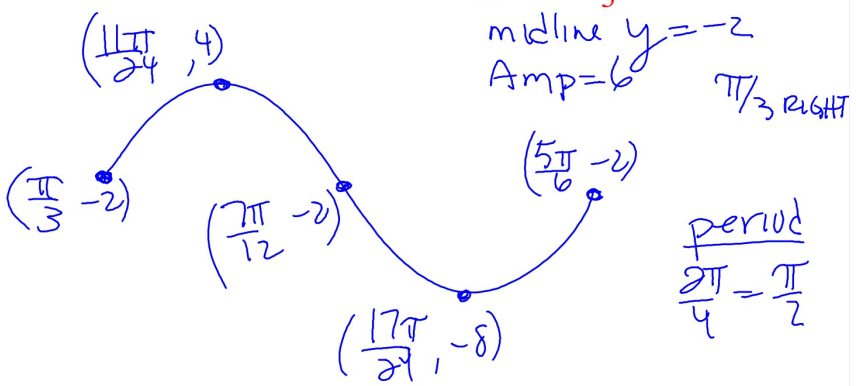
$b = \frac{2\pi}{\pi} = 2$

$y = 4\cos(2(x + \frac{\pi}{12})) - 1$

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

Graph one period of this function. Label the coordinates of the maximums, minimums, and x-intercepts (zeros).

$y = 6\text{Sin}(4(x - \frac{\pi}{3})) - 2$



Graph one period of this function. Label the coordinates of the maximums, minimums, and x-intercepts (zeros).

$y = -5\text{Cos}(6(x + \frac{\pi}{4})) + 11$