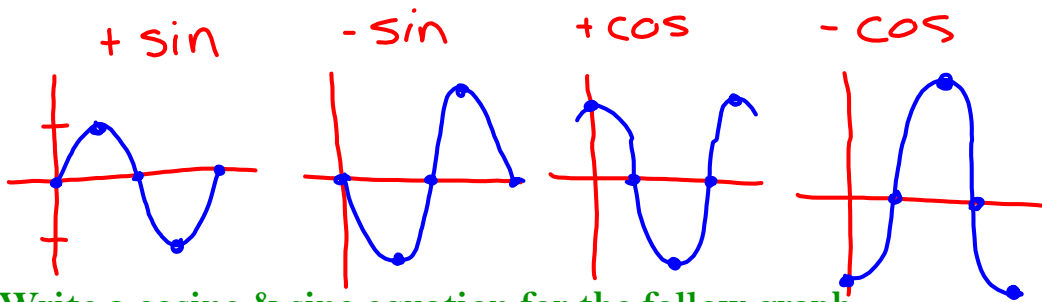
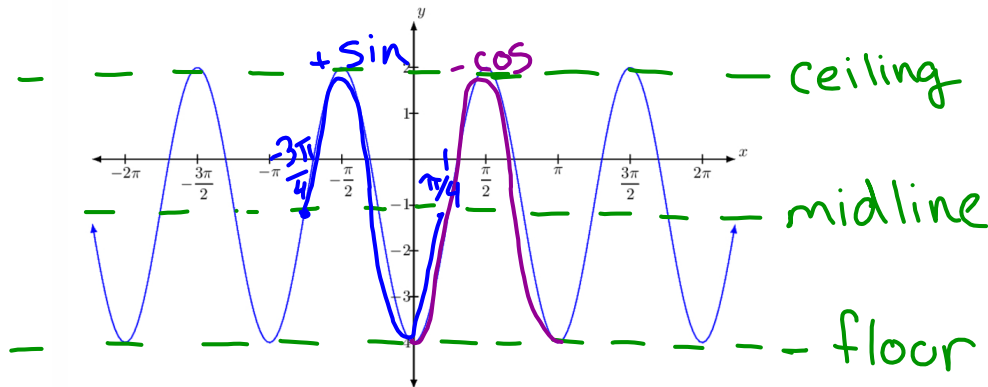


Writing Equations of Trig Graphs

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Write a cosine & sine equation for the follow graph:



1. Sketch the ceiling, floor & midline on the graph.
2. Find **d** (vertical shift). It is the new midline. $d = -1$
3. Find **a** (amplitude). It is the distance from the midline to either the height or ceiling.
4. Decide whether you are going to write an equation for sine or cosine & highlight 1 period. $a = 3$
5. The starting point on the left is **c** (phase shift). Remember to change the sign when you put it in the equation.

$$- \cos: c = 0 \qquad + \sin: c = \frac{3\pi}{4}$$

6. To find the period length subtract the end pt - start pt. Set that equal to $2\pi/b$ so you can solve for **b**.

$$\begin{aligned} \text{per} &= \text{end} - \text{beg} & \text{per} &= \pi \\ &= \frac{\pi}{4} - \left(-\frac{3\pi}{4}\right) & \frac{2\pi}{b} &= \frac{\pi}{1} \\ &= \frac{4\pi}{4} & \frac{b\pi}{\pi} &= \frac{2\pi}{\pi} \quad b=2 \end{aligned}$$

7. Plug in a, b, opposite c, & d into $y = a \text{ trig } b(x - c) + d$.

*a, b, & d will be the same no matter where you start. Only c changes.

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