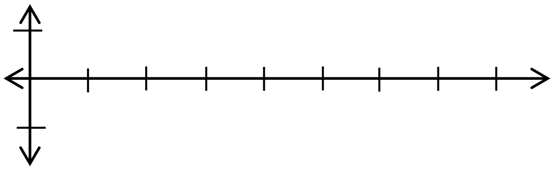
Sine and Cosine Graphs

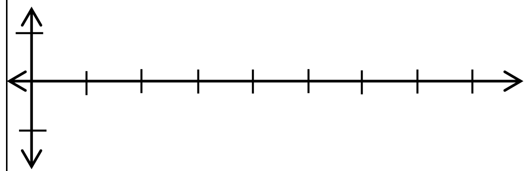
Graph $y = \sin x$

Amplitude: Period:



Graph $y = \cos x$

Amplitude: Period:



Now we will look at some transformations to these functions. *We will save horizontal translations for a later lesson.* The equations we will work with today will look like either $y = a\sin(bx) + k$ or $y = a\cos(bx) + k$. But what impact does each piece have on the graphs of sine or cosine?

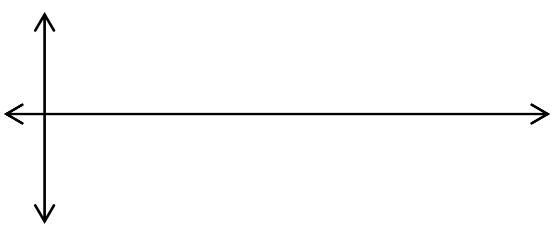
- $|a|$ is the __________________ and represents the stretch factor. The amplitude is half the vertical distance between the maximum height (_____________) and the lowest height (_____________). If a < 0, the function is reflected vertically.

- k is the vertical shift. If k is positive, the graph is translated k units _______. If k is negative, the graph is translated k units _______.

- b is the _________________ and changes the ______________ of the function (How long it takes to complete one cycle.). It takes _________ degrees for $y = \sin x$ or $y = \cos x$ to complete one cycle. Therefore $period = \dfrac{360°}{b}$ or b = $\dfrac{360°}{period}$.

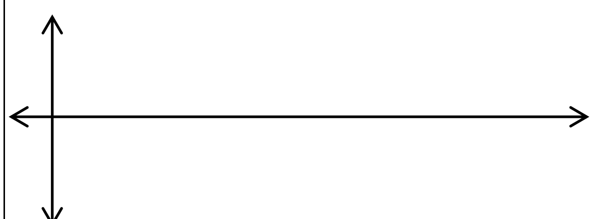
Graph $y = 3\sin(2x)$

Amplitude: Vertical shift: Period:



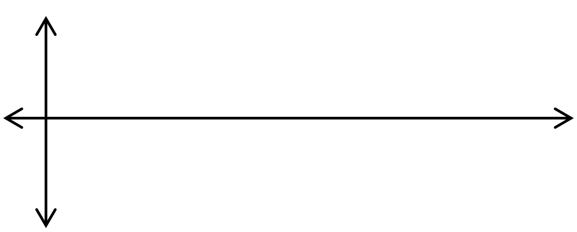
Graph $y = 2\cos x - 1$

Amplitude: Vertical shift: Period:



Graph $y = -\sin(\frac{x}{2}) + 2$

Amplitude: Vertical shift: Period:



Graph $y = \cos(4x)$

Amplitude: Vertical shift: Period: