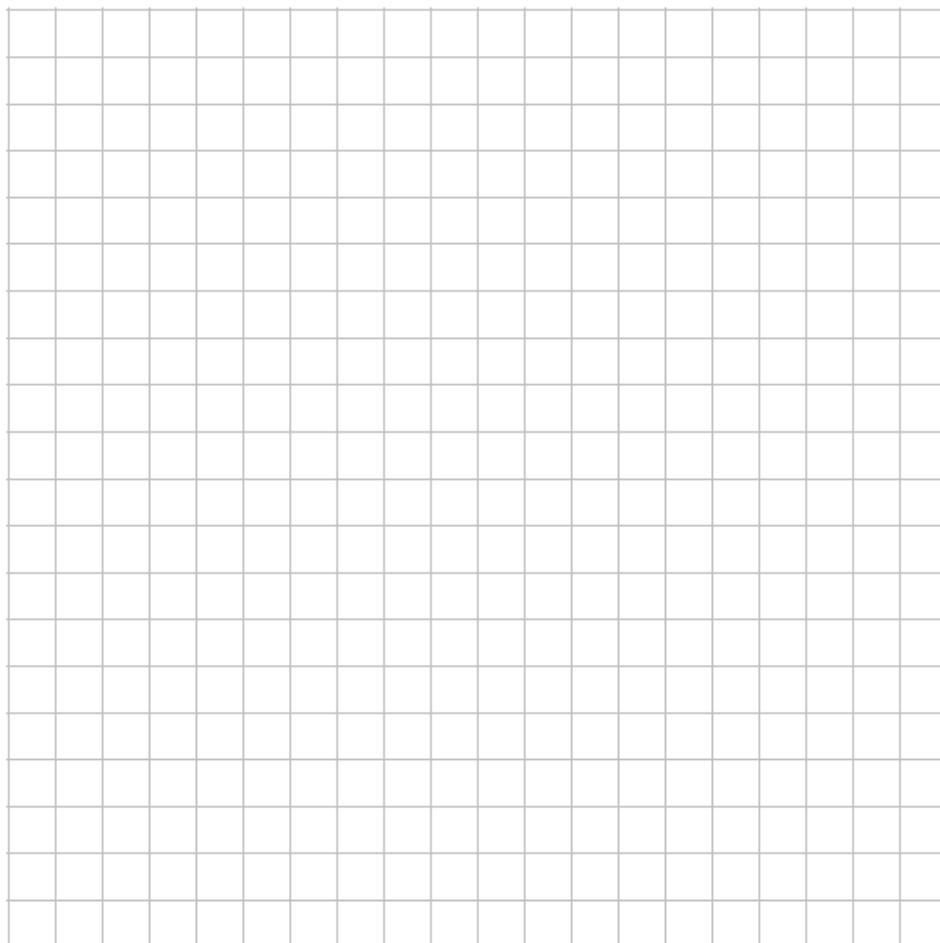


Vertical Shifts of Trigonometric Graphs

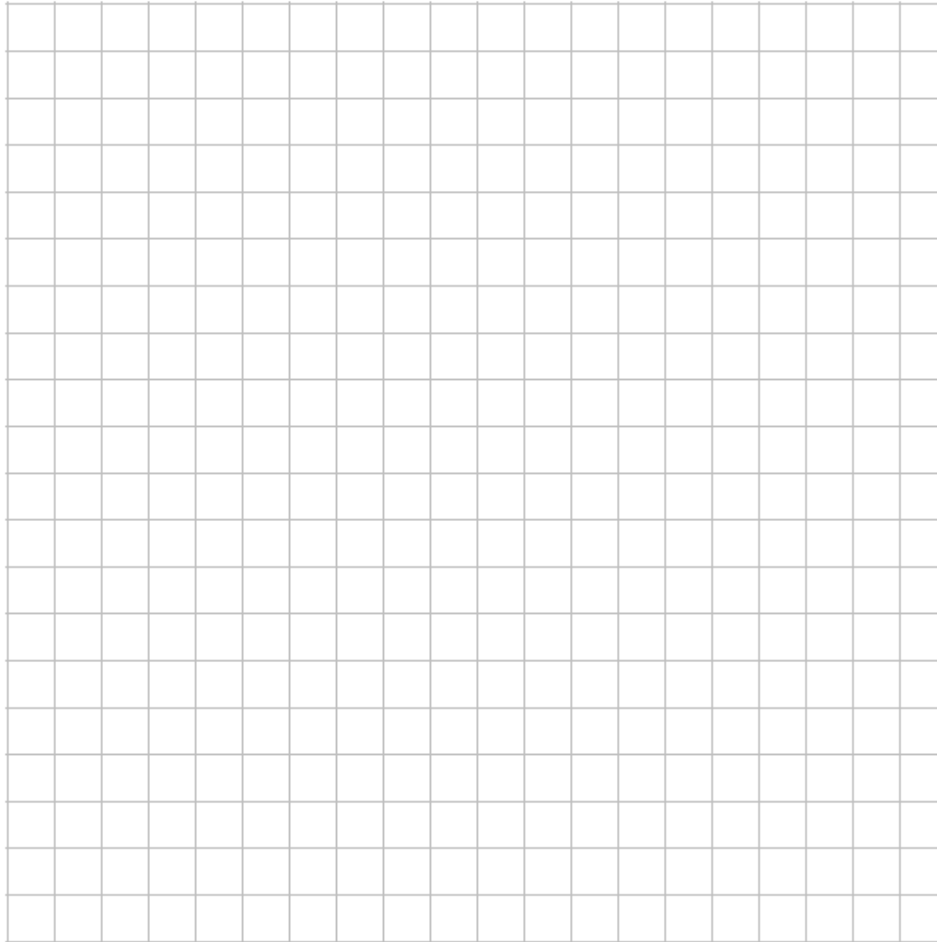
1. Complete the table:

x (radians)	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$y = \sin x$	0				
$y = \cos x$	1				
$y = 2 \sin x$					
$y = \sin x + 4$					
$y = \cos x - 5$					

2. Use the table to graph $y = 2 \sin x$, $y = \sin x + 4$, and $y = \cos x - 5$ on the same set of axes, on the interval $-2\pi \leq x \leq 2\pi$ radians.



3. Sketch the graph of $y = -3\cos\left(\frac{\pi}{4}x\right) + 5$ on the interval $-8 \leq x \leq 8$ radians.



4. A student attaches one end of a rope to a wall at a fixed point 3 feet above the ground, as shown in the accompanying diagram, and moves the other end of the rope up and down, producing a wave described by the equation $y = a \sin bx + c$. The range of the rope's height above the ground is between 1 and 5 feet. The period of the wave is 4π . Write the equation that represents this wave.

