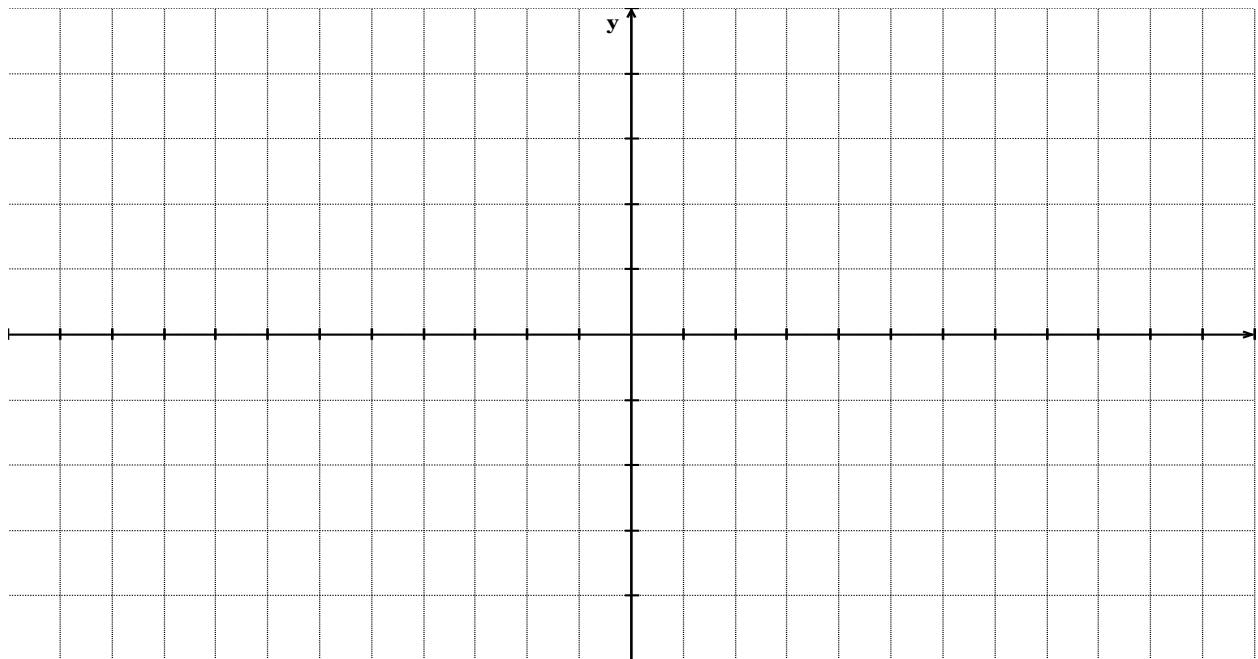


## Combining Transformations of Sinusoidal Functions

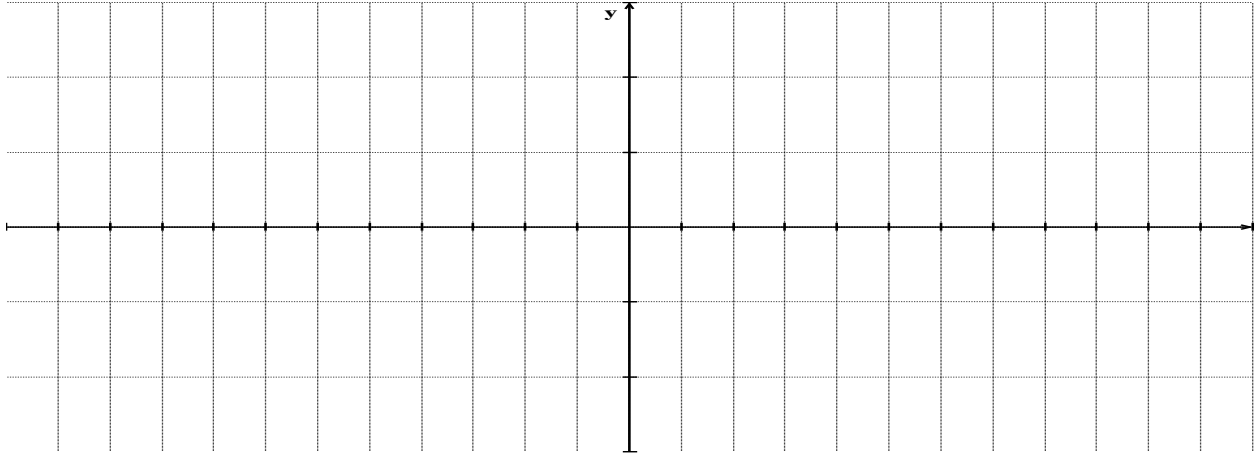
We will apply the box method as follows:

- Use the  $c$  value to sketch the horizontal axis for the function
- Use the amplitude to sketch the location of the top and bottom of the “box”
- Use the  $d$  value (phase shift) to sketch the location of the left side of the box
- Use the  $k$  value to find the period and then sketch the right side of the box
- Complete the pattern of the first cycle of the graph within the box
- Extend the pattern left and/or right to complete the graph

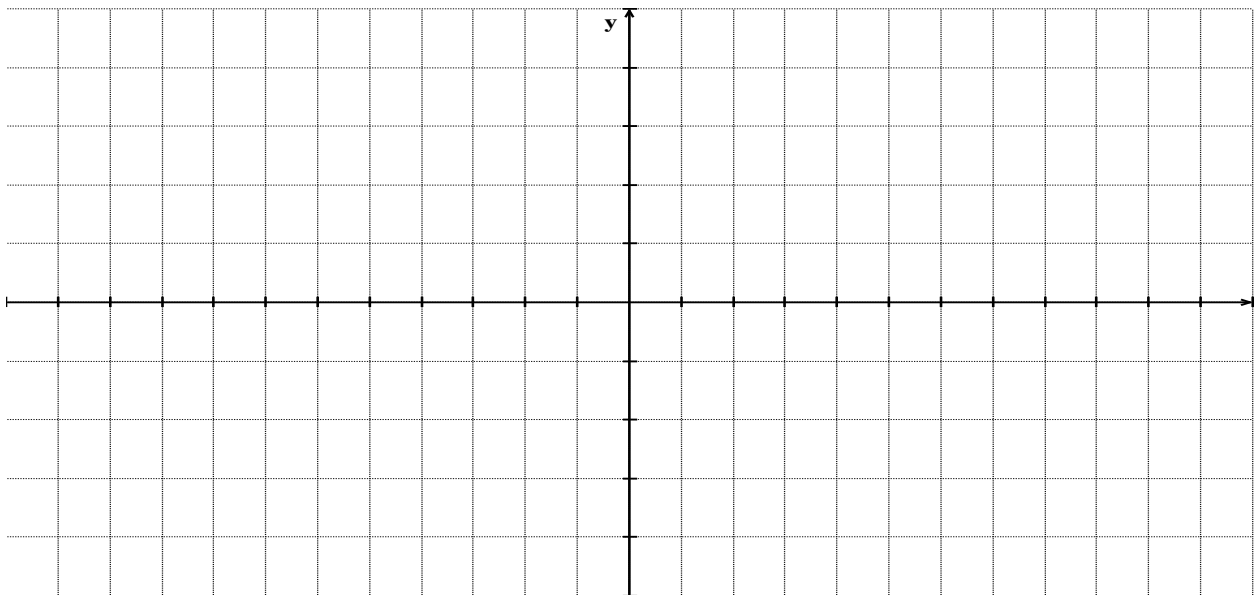
**Example 1** Graph the function  $y = -4 \cos(2x) + 1$ .



**Example 2** Graph the function  $y = 0.5\sin(2x - 180^\circ)$ .



**Example 3** Graph the function  $y = 3\cos\frac{1}{4}(x + 120^\circ) - 2$ .



**Example 4** Graph two cycles for the function  $y = -1.5 \sin 3(x - 45^\circ) + 1$ .

