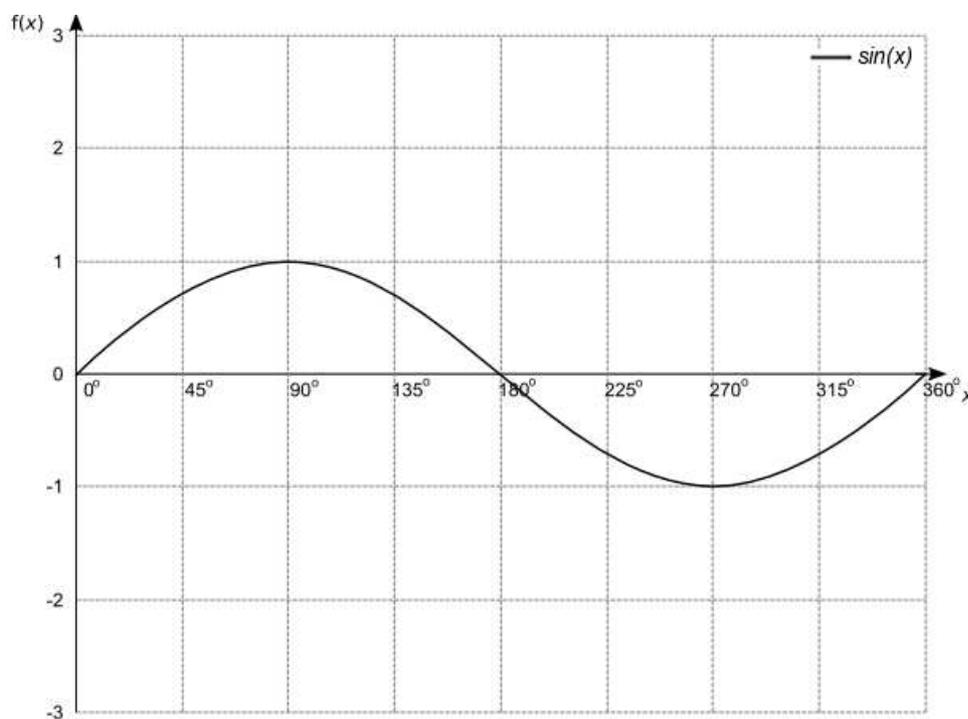


Amplitude In this section, we'll explore what happens when we vary the value of a in the sinusoidal function $a \sin(x)$. We'll set different values for a to see how it affects the function. We will set a to be $\frac{1}{2}$, 2 and 3. Fill in the corresponding values of these functions at various points along the x -axis in the table below:

x	$\sin(x)$	$\frac{1}{2} \sin(x)$	$2 \sin(x)$	$3 \sin(x)$
0°	0			
90°	1			
180°	0			
270°	-1			
360°	0			

Now we have enough information to plot the curves $\frac{1}{2} \sin(x)$, $2 \sin(x)$ and $3 \sin(x)$. Sketch in these functions in the grid below.



- What changes have you noticed? Which properties of the sinusoidal function remain the same?

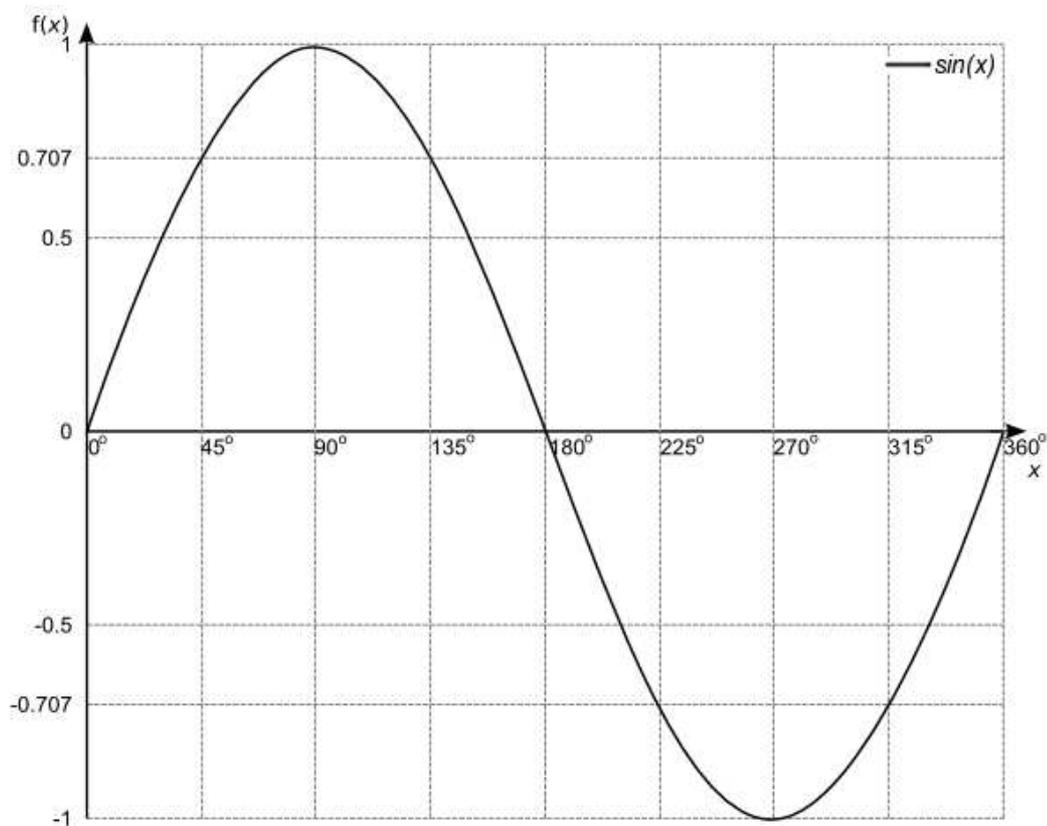
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- Can you also sketch the function $-\sin(x)$ in the grid above?

Periodicity We've seen that the value a in the sinusoidal function $a \sin(bx)$ only affects the *amplitude* of the resultant curve. Now, we'll explore what happens when we vary the value of b . We will investigate for values $b = \frac{1}{2}$ and $b = 2$.

Fill in the values of these functions at various points along the x -axis in the table below:

x	$\sin(x)$	$2x$	$\sin(2x)$	$\frac{1}{2}x$	$\sin(\frac{1}{2}x)$
0°	0	0°		0°	
45°	$\frac{1}{\sqrt{2}}$	90°			
90°	1	180°		45°	
135°	$\frac{1}{\sqrt{2}}$	270°			
180°	0	360°		90°	
225°	$-\frac{1}{\sqrt{2}}$				
270°	-1			135°	
315°	$-\frac{1}{\sqrt{2}}$				
360°	0			180°	

Now we are able to plot the functions $\sin(2x)$ and $\sin(\frac{1}{2}x)$. Plot the points you've calculated above in the grid below and sketch the graphs of the two sinusoidal functions. (Remember to plot the curves against x and not $2x$ or $\frac{1}{2}x$)



- What changes have you observed? Which properties of the sinusoidal function remain the same?

- Can you also sketch the function $\sin(\frac{3}{2}x)$ in the grid above? Where are the x -intercepts?
- Varying the values of b will affect the *periodicity* of the sinusoidal function. For $b > 1$, the period of the function will _____; it will become compressed. For $b < 1$, the period of the function will _____; it will become more spread out.