

## Keeper #16: graphing trig functions

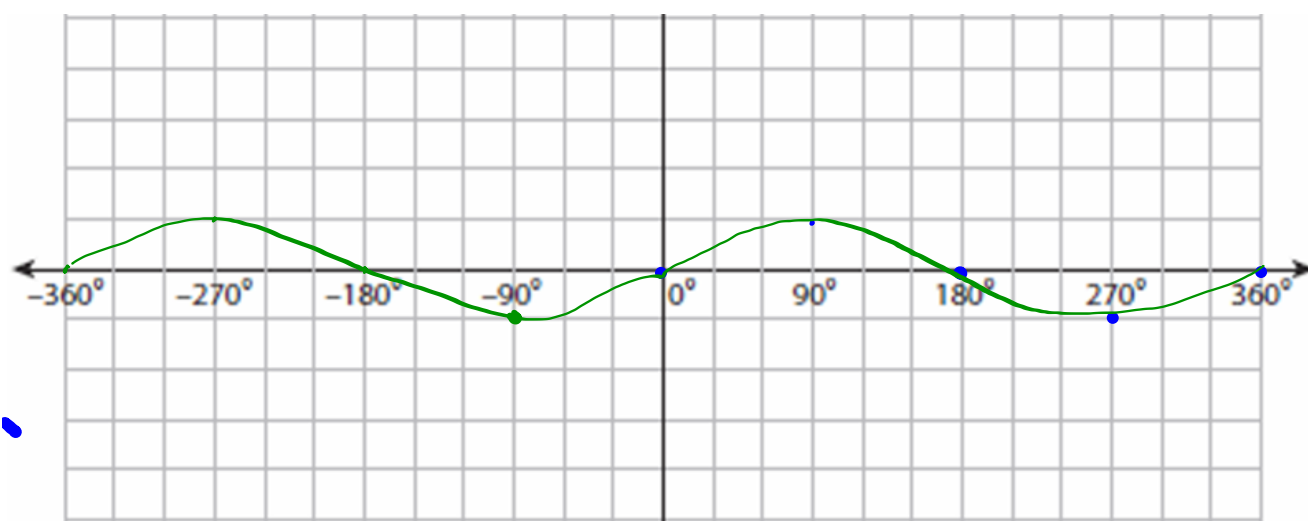
$$f(x) = a \cdot \sin b(x - c) + d$$

Diagram illustrating the components of the trigonometric function  $f(x) = a \cdot \sin b(x - c) + d$ :

- Amplitude:** Indicated by a blue arrow pointing to  $a$ . A small graph shows a sine wave with a vertical bracket labeled  $a$  from the horizontal axis to the peak, and another labeled  $a$  from the horizontal axis to the trough.
- Period:** Indicated by a green arrow pointing to  $b$ . The period is labeled as  $\frac{2\pi}{b}$ .
- Phase Shift:** Indicated by a red arrow pointing to  $c$ . A red double-headed arrow below it represents the horizontal shift.
- Vertical Shift:** Indicated by a blue arrow pointing to  $d$ .

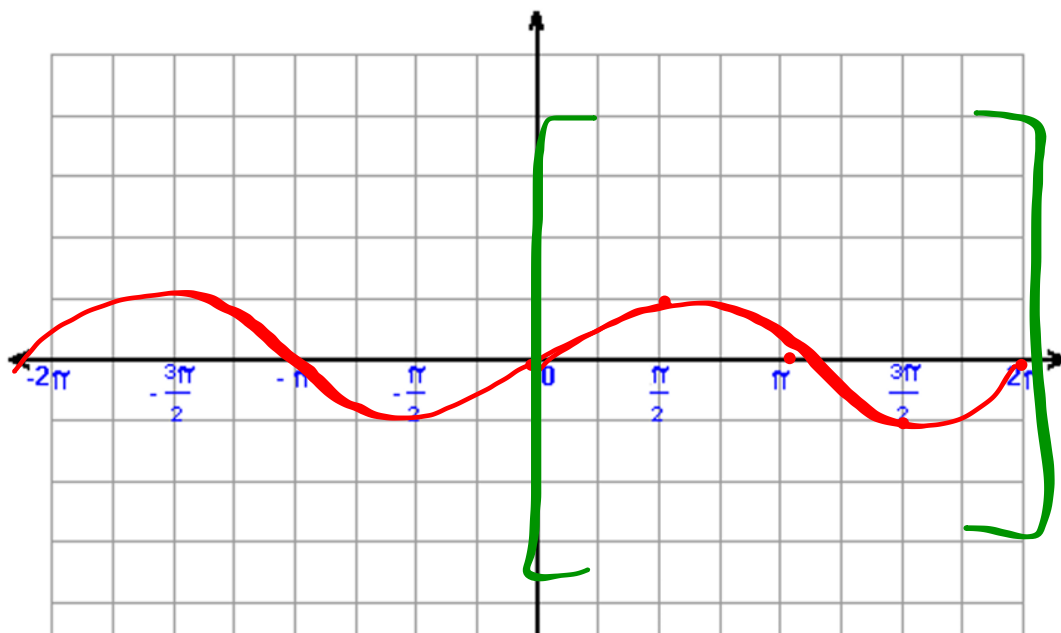
$\sin(x)$ 

X	0	90	180	270	360
Y	0	1	0	-1	0



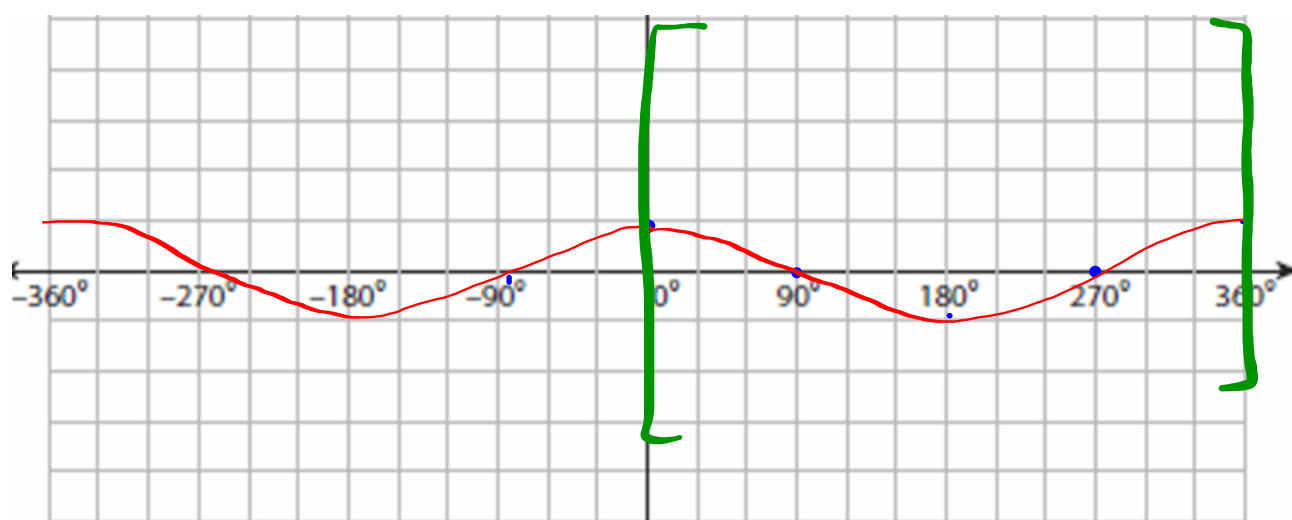
$$\sin(x)$$

X	0	$\frac{\pi}{2}$	$\pi$	$\frac{3\pi}{2}$	$2\pi$
Y	0	1	0	-1	0

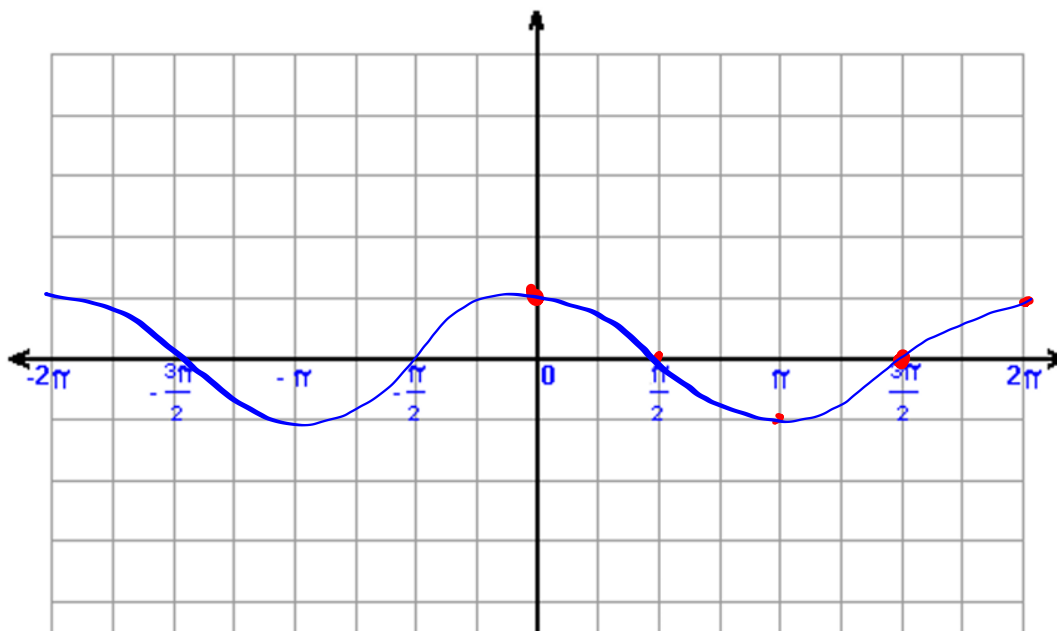


$$\cos(x)$$

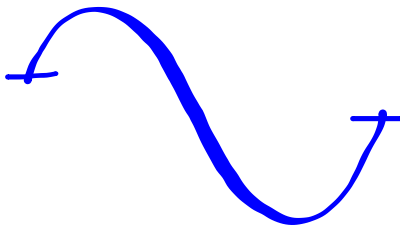
X	0	90	180	270	360
Y	1	0	-1	0	1



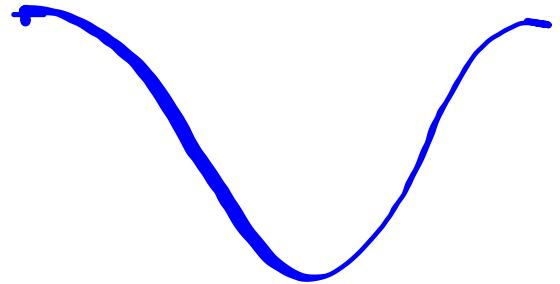
X	0	$\frac{\pi}{2}$	$\pi$	$\frac{3\pi}{2}$	$2\pi$
Y	1	0	-1	0	1



sin



cos



amp  
change - mult. to  $y$

VS -  $\pm$  to  $y$ -values

$$y = \cancel{1} + 4\sin(x) - \cancel{1}$$

a → 1      d → 1

x	0	$\frac{\pi}{2}$	$\pi$	$\frac{3\pi}{2}$	$2\pi$
y	<del>0</del>	<del>1</del>	<del>0</del>	<del>-1</del>	<del>0</del>
$4 \cdot y - 1$	-1	3	-1	-5	-1



