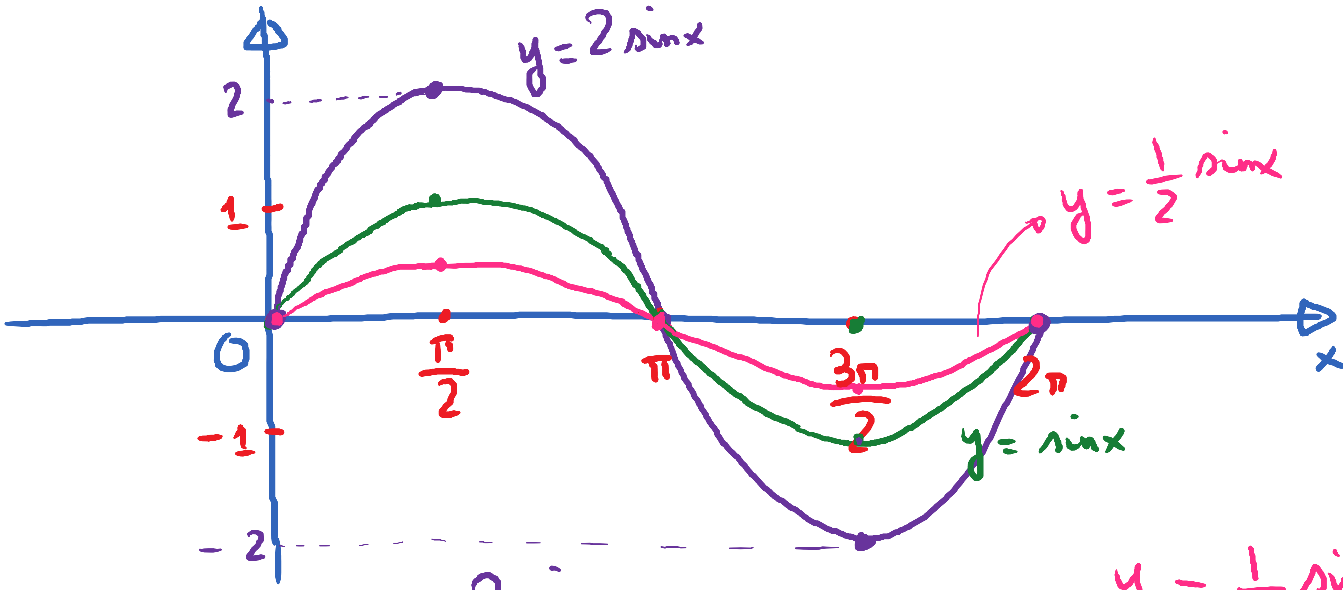
Graphs of functions of the form $y = a\sin x$



$y = 2\sin x$

$y = \frac{1}{2}\sin x$

x	$y = \sin x$
0	0
$\frac{\pi}{2}$	1
π	0
$\frac{3\pi}{2}$	-1
2π	0

x	$y = 2\sin x$
0	0
$\frac{\pi}{2}$	2
π	0
$\frac{3\pi}{2}$	-2
2π	0

x	$y = \frac{1}{2}\sin x$
0	0
$\frac{\pi}{2}$	$\frac{1}{2}$
π	0
$\frac{3\pi}{2}$	$-\frac{1}{2}$
2π	0

The amplitude of a periodic function is half the difference between the maximum and the minimum values of the function

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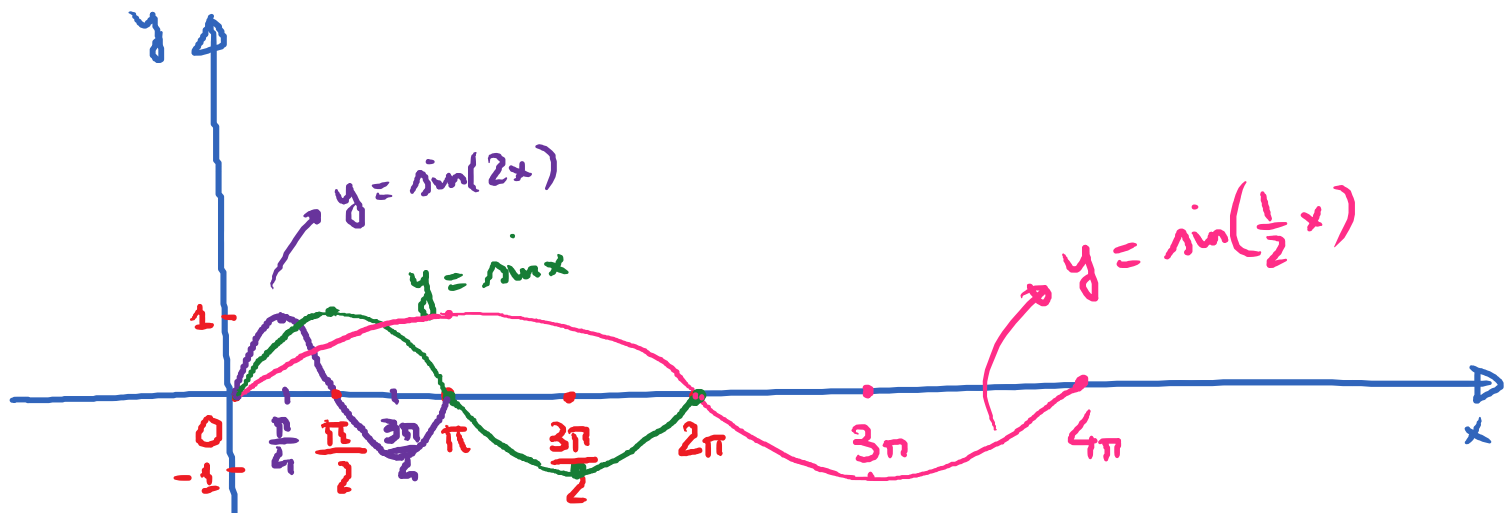
In general, the amplitude of $y = a\sin x$ or $y = a\cos x$ is $|a|$.

Graphs of functions of the form $y = \sin(bx)$



x	$y = \sin x$
0	0
$\frac{\pi}{2}$	1
π	0
$\frac{3\pi}{2}$	-1
2π	0

$y = \sin\left(\frac{1}{2}x\right)$

x	$y = \sin\left(\frac{1}{2}x\right)$
0	0
π	1
2π	0
3π	-1
4π	0

The period of the function $y = \sin(bx)$ or $y = \cos(bx)$ is $\dfrac{2\pi}{b}$.

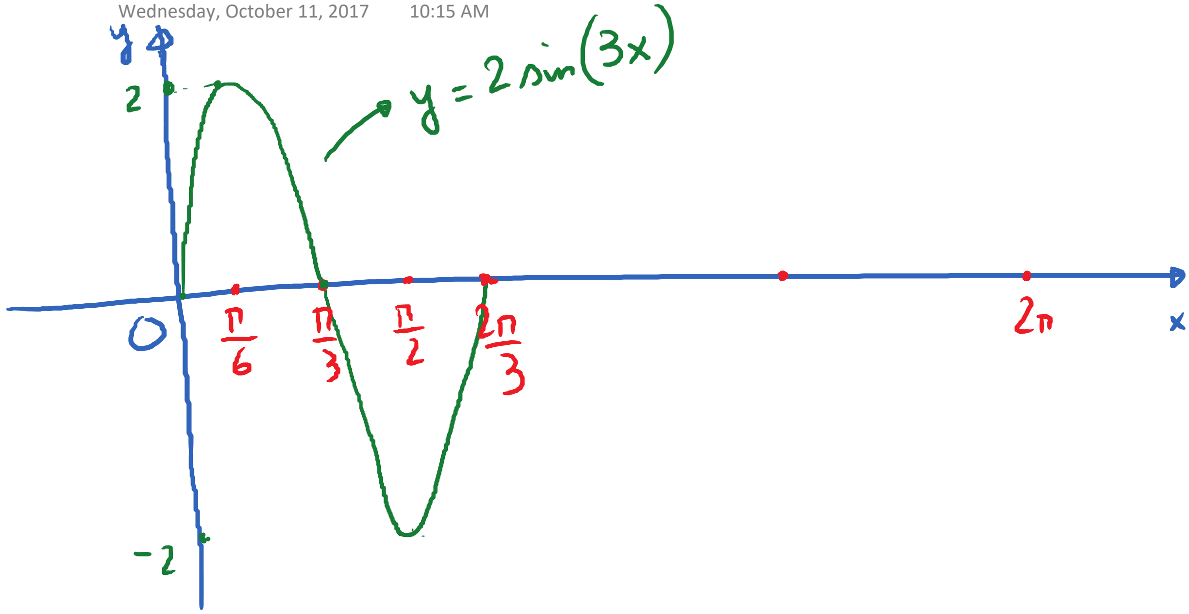
Graphs of Functions of the form $y = a\sin(bx)$

E.g. Graph the function $y = 2\sin(3x)$ in one period.

Period $= \dfrac{2\pi}{3}$; Amplitude $= 2$.

x	$y = \sin x$
0	0
$\frac{\pi}{2}$	1
π	0
$\frac{3\pi}{2}$	-1
2π	0

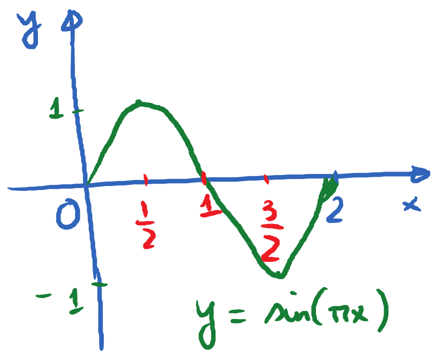
x	$y = 2\sin(3x)$
0	0
$\frac{\pi}{6}$	2
$\frac{\pi}{3}$	0
$\frac{\pi}{2}$	-2
$\frac{2\pi}{3}$	0



E.g. Graph $y = \sin(\pi x)$

x	$y = \sin x$
0	0
$\frac{\pi}{2}$	1
π	0
$\frac{3\pi}{2}$	-1
2π	0

x	$y = \sin(\pi x)$
0	0
$\frac{1}{2}$	1
1	0
$\frac{3}{2}$	-1
2	0



Ex. Graph $y = 3\cos(\pi x)$ in one period.

x	$y = \cos x$

x	$y = 3\cos(\pi x)$

Solved!