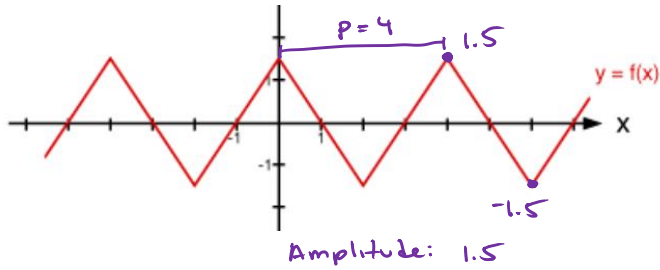


# GRAPHS OF THE SINE AND COSINE FUNCTIONS

- OBJECTIVES:** 1) Determine the amplitude and period of a function.  
2) Graph sine and cosine functions.

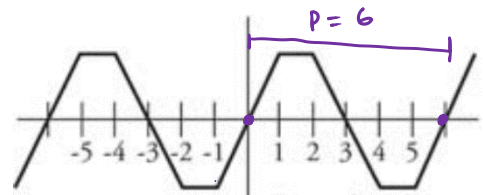
## PERIODIC FUNCTION AND ITS PERIOD:

$$f(x+p) = f(x), \text{ } p \text{ is the period}$$



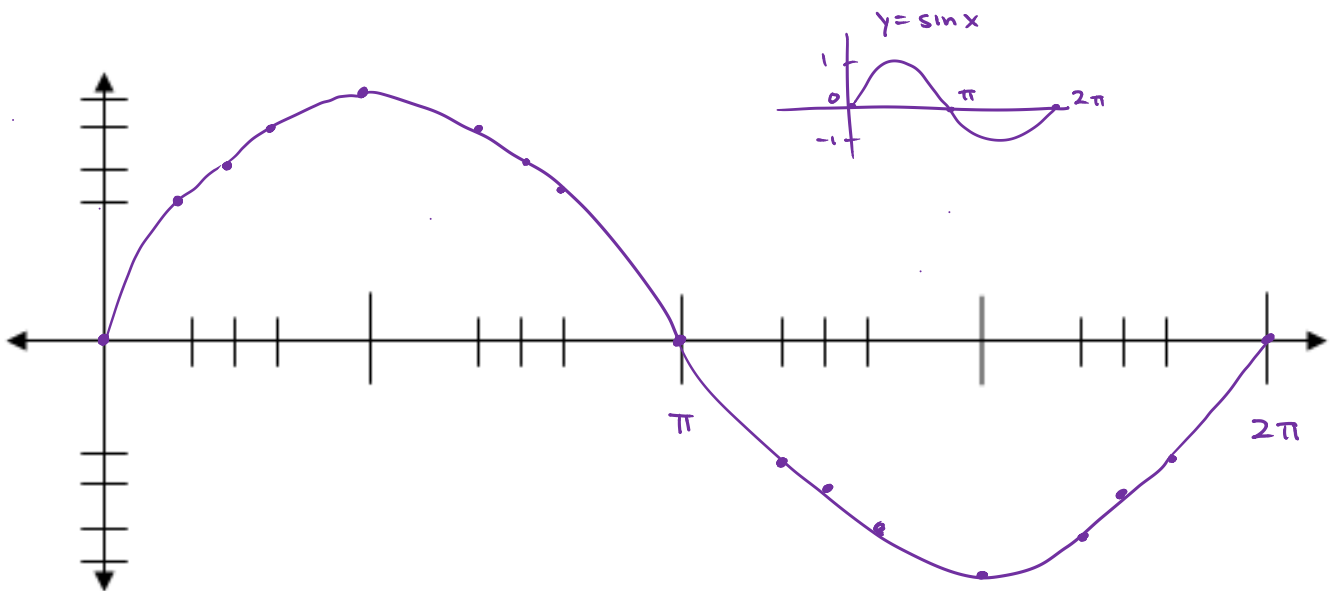
## AMPLITUDE:

$$\frac{\text{Maximum} - \text{Minimum}}{2} = \text{Amplitude}$$



## GRAPH OF SINE FUNCTION: $y = \sin x$

<b>x</b>	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	$\pi$	$\frac{7\pi}{6}$	$\frac{5\pi}{4}$	$\frac{4\pi}{3}$	$\frac{3\pi}{2}$	$\frac{5\pi}{3}$	$\frac{7\pi}{4}$	$\frac{11\pi}{6}$	$2\pi$
<b>y</b>	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	-1	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0



AMPLITUDE: 1

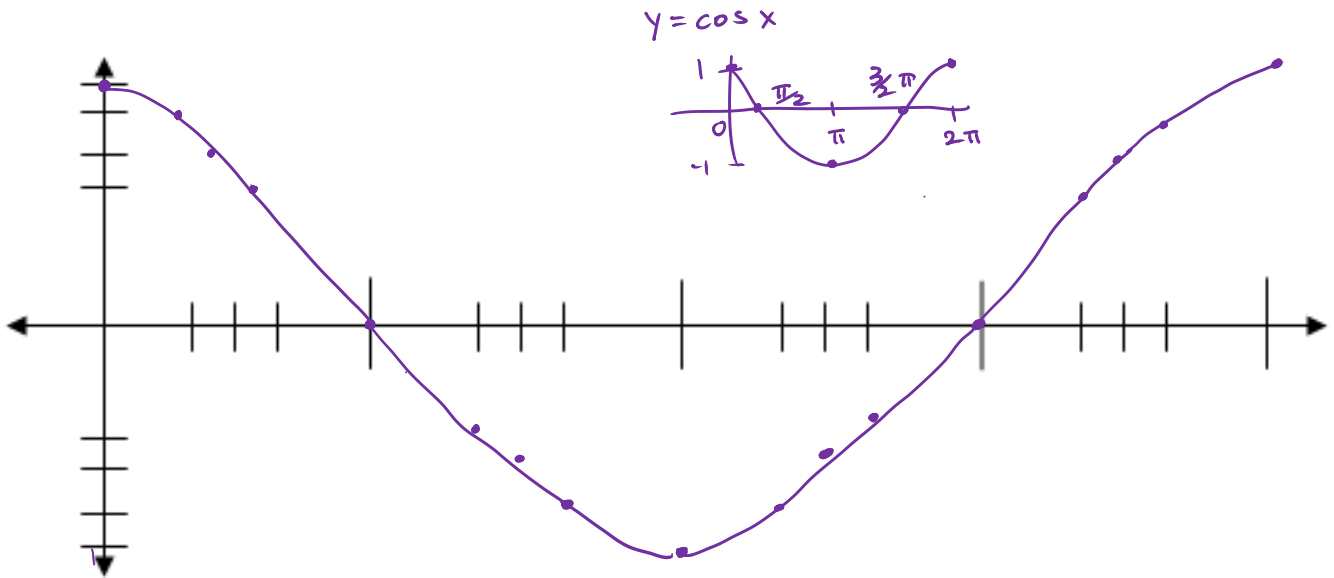
PERIOD:  $2\pi$

DOMAIN:  $\mathbb{R}$

RANGE:  $-1 \leq y \leq 1$

## GRAPH OF COSINE FUNCTION: $y = \cos x$

<b>x</b>	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	$\pi$	$\frac{7\pi}{6}$	$\frac{5\pi}{4}$	$\frac{4\pi}{3}$	$\frac{3\pi}{2}$	$\frac{5\pi}{3}$	$\frac{7\pi}{4}$	$\frac{11\pi}{6}$	$2\pi$
<b>y</b>	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	-1	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{1}{2}$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1



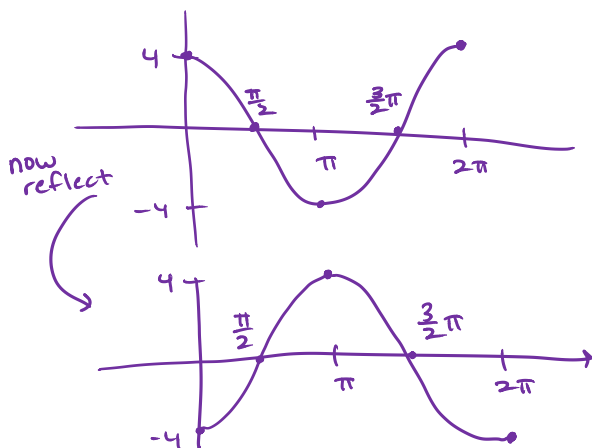
**AMPLITUDE:** 1      **PERIOD:**  $2\pi$       **DOMAIN:**  $\mathbb{R}$       **RANGE:**  $-1 \leq y \leq 1$

Sketch the graphs of each function. Find the amplitude and period of each graph.

1)  $y = -4 \cos x$

vertical stretch & reflection over the x-axis

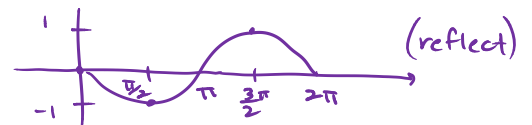
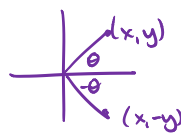
If  $x = 0 \Rightarrow y = -4(1) = -4$



2)  $y = \sin(-2x)$

horizontal compression & reflection over x-axis

$y = \sin(-2x) = -\sin(2x)$



$y = \sin(2x)$   
 $2x = 2\pi$   
 $x = \pi$

now compress

