Math 119 – Chapter 10.1 (Graphs of $y = a\sin x$ *and* $y = a\cos x$)

Objectives:

- Find the amplitude for a sine function and a cosine function
- Graph the sine and cosine function

Graphs of the trigonometric functions are useful in applications which involve periodic values, values which repeat on a regular basis. These graphs are useful in many technical applications including filtering electronic signals in communications, sound, light, ocean waves and tides, alternating current, sound cancelation technology etc.

Graph: $y = f(x) = \sin x$

x	x	f(x)
$0°$	0	
$30°$	$\frac{\pi}{6}$	
$60°$	$\frac{\pi}{3}$	
$90°$	$\frac{\pi}{2}$	
$120°$	$\frac{2\pi}{3}$	
$150°$	$\frac{5\pi}{6}$	
$180°$	π	
$210°$	$\frac{7\pi}{6}$	
$240°$	$\frac{4\pi}{3}$	
$270°$	$\frac{3\pi}{2}$	
$300°$	$\frac{5\pi}{3}$	
$330°$	$\frac{11\pi}{6}$	
$360°$	2π	

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Graph: $y = f(x) = \cos x$

x	x	f(x)
$0°$	0	
$30°$	$\frac{\pi}{6}$	
$60°$	$\frac{\pi}{3}$	
$90°$	$\frac{\pi}{2}$	
$120°$	$\frac{2\pi}{3}$	
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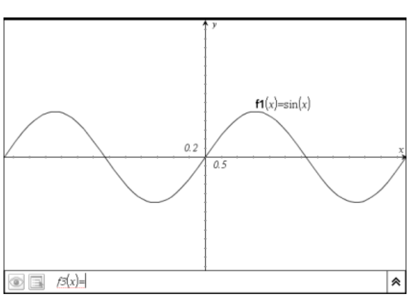
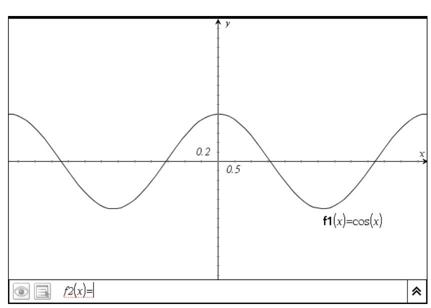
$300°$	$\frac{5\pi}{3}$	
$330°$	$\frac{11\pi}{6}$	
$360°$	2π	

Since the basic shapes of the sine and cosine curve remain the same it is important to understand:

1. The shape of the sine and cosine curves
2. Where the graphs cross the x-axis
3. Where they reach their highest and lowest values
4. They continue indefinitely in either directions





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Let's graph $y = a\sin x$ *and* $y = a\cos x$

$y = f(x) = 3\sin x$

x	$\sin x$	$f(x) = 3\sin x$
0		
$\frac{\pi}{6}$		
$\frac{\pi}{3}$		
$\frac{\pi}{2}$		
$\frac{2\pi}{3}$		
$\frac{5\pi}{6}$		
π		
$\frac{7\pi}{6}$		
$\frac{4\pi}{3}$		
$\frac{3\pi}{2}$		
$\frac{5\pi}{3}$		
$\frac{11\pi}{6}$		
2π		

Let's let the calculator show us the following:

$y = 2\cos x$

$y = -2\cos x$

$y = 1/4\sin x$

$y = -1/4\sin x$

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Sketch the following functions:

1. $y = 3\sin x$

2. $y = 2\cos x$

3. $y = -5\sin x$

4. $y = -\frac{1}{3}\cos x$

Let's play "What's My Function"?