

Basic Sine and Cosine Curves (Section 4.5)

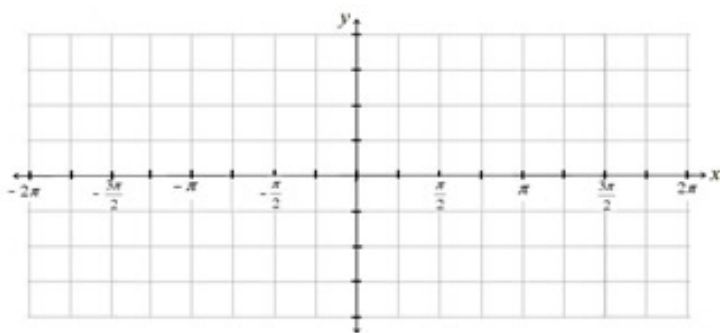
Warm-up: Using the unit circle, fill in values for the table below.

x	0	$\pi/2$	π	$3\pi/2$	2π
sinx					
cosx					

Parent Graphs for Sine and Cosine Curves

Critical Points (for parent graphs): _____

Sine Curve

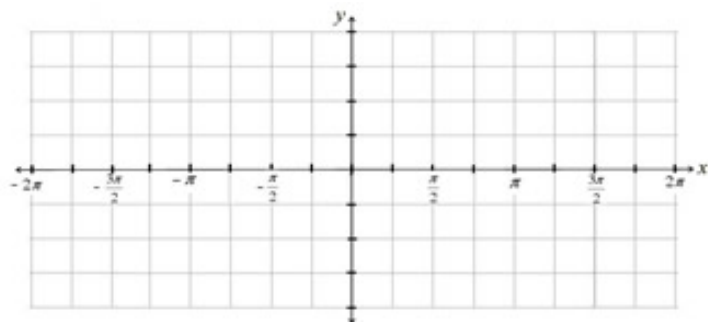


Domain: _____ x-intercepts: _____

Range: _____ y-intercepts: _____

Period: (one complete cycle) _____ Oscillation Line _____

Cosine Curve



Domain: _____ x-intercepts: _____

Range: _____ y-intercepts: _____

Basic Sine and Cosine Curves (Section 4.5)

Period: (one complete cycle) _____ Oscillation Line _____

Transformations of the Sine and Cosine Curves

Consider the general equations: $y = d + a \sin(bx - c)$ and $y = d + a \cos(bx - c)$

Amplitude and Period (For equations with $d = 0$ and $c = 0$)

The constant factor a acts as _____.

Amplitude = $|a| =$ _____.

	Curve	Amplitude	Range	Critical Points	Shape (circle)	Vertical (circle)
a	$y = 3 \cos x$				Normal/Reverse	Stretch/Shrink
b	$y = -2 \sin x$				Normal/Reverse	Stretch/Shrink
c	$y = 7 \sin x$				Normal/Reverse	Stretch/Shrink
d	$y = -\pi \cos x$				Normal/Reverse	Stretch/Shrink

The period of $y = a \sin(bx - c)$ and $y = a \cos(bx - c)$ is given by _____.

	Curve	Amplitude	Period	Critical Points	Shape (circle)	Vertical Stretch (circle)	Horizontal Stretch (circle)
a	$y = 2 \sin x$				Normal Reversed	Stretched Shrunk	Compressed Elongated
b	$y = \sin 2x$				Normal Reversed	Stretched Shrunk	Compressed Elongated
c	$y = 2 \sin 2x$				Normal Reversed	Stretched Shrunk	Compressed Elongated
d	$y = 4 \cos 3x$				Normal Reversed	Stretched Shrunk	Compressed Elongated
e	$y = -3 \cos 6x$				Normal Reversed	Stretched Shrunk	Compressed Elongated

Basic Sine and Cosine Curves (Section 4.5)

f	$y = \frac{1}{2} \sin \frac{1}{2} x$				Normal Reversed	Stretched Shrunk	Compressed Elongated
g	$y = \sin \frac{4}{3} x$				Normal Reversed	Stretched Shrunk	Compressed Elongated
h	$y = -\frac{3}{4} \sin \frac{3}{4} x$				Normal Reversed	Stretched Shrunk	Compressed Elongated

Steps to Determine Critical Points

1. _____
2. _____
3. _____
4. _____

Horizontal Translation (Phase Shift) and Vertical Translation

Phase Shift = _____

Vertical Shifts = _____

When there is a vertical shift, the graph oscillates about the line _____.

Class Work

	Curve	Phase Shift & Direction	Critical Points	Osc Line	Shape (circle)	Range [,]
a	$y = 3 - \cos x$				Normal Reversed	
b	$y = 1 + 2 \cos 2x$				Normal Reversed	
c	$y = -2 - 3 \sin 4x$				Normal Reversed	
d	$y = 5 \sin(x - 30^\circ)$				Normal Reversed	
e	$y = -1 - \cos(x + 15^\circ)$				Normal Reversed	
f	$y = 2 + \frac{1}{2} \sin(2x - 10^\circ)$				Normal Reversed	
g	$y = \frac{1}{2} - 4 \cos(3x + 15^\circ)$				Normal Reversed	

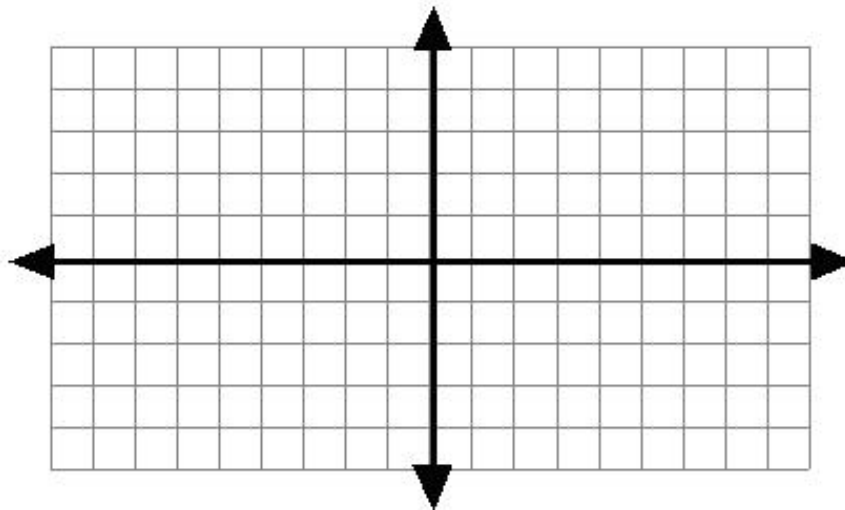
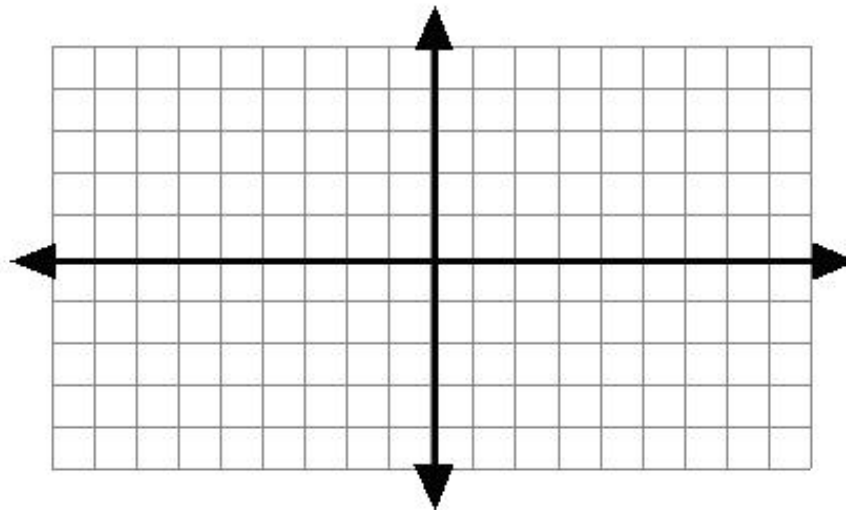
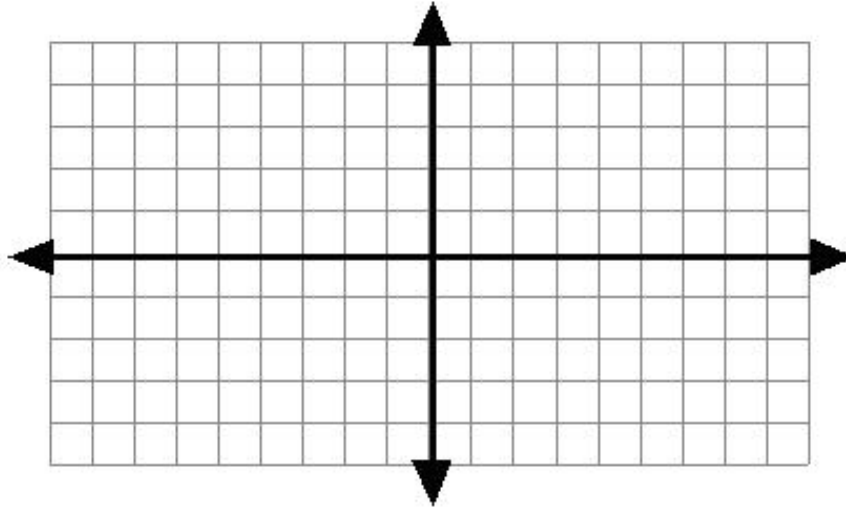
Basic Sine and Cosine Curves (Section 4.5)

h	$y = -\frac{3}{4}\sin\left(\frac{1}{2}x - 40\right)$				Normal Reversed	
i	$y = 5 + 3\sin\left(2x - \frac{\pi}{2}\right)$				Normal Reversed	

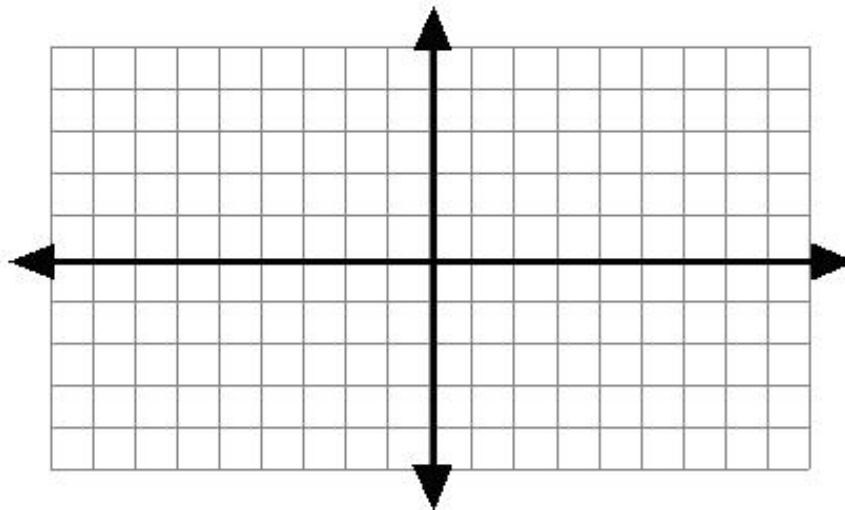
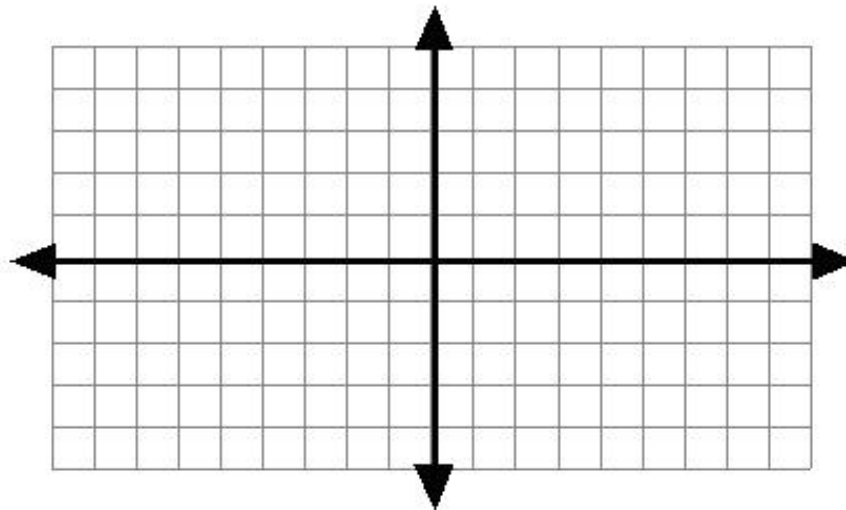
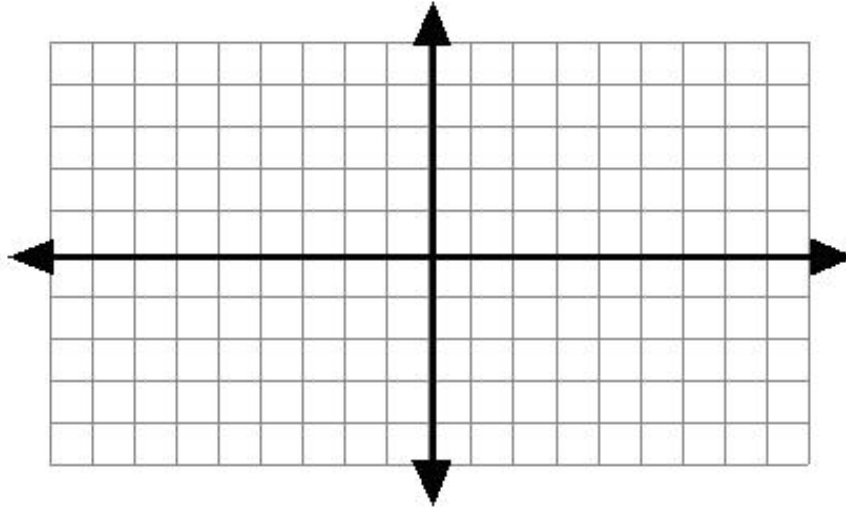
Steps for Graphing $y = d + a\sin(bx - c)$ **and** $y = d + a\cos(bx - c)$

1. _____
2. _____
3. _____
4. _____
5. _____

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