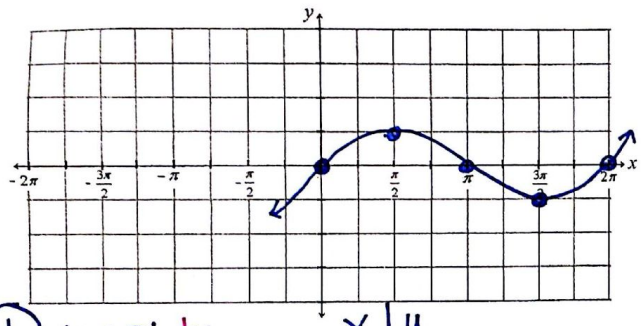
$y = a \cdot \sin[b(x-c)] + d$

$y = a \cdot \cos[b(x-c)] + d$

$|a|$ = amplitude

$\frac{2\pi}{b}$ = period

$+c$ left
$-c$ right
$+d$ up
$-d$ down



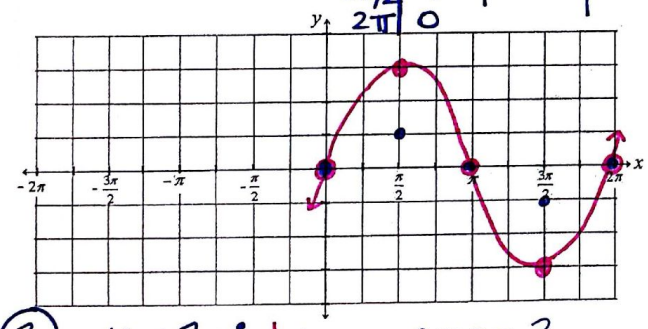
① $y = \sin x$

SOIL

x	y
0	0
π/2	1
π	0
3π/2	-1
2π	0

amp = 1

per = $\frac{2\pi}{1}$

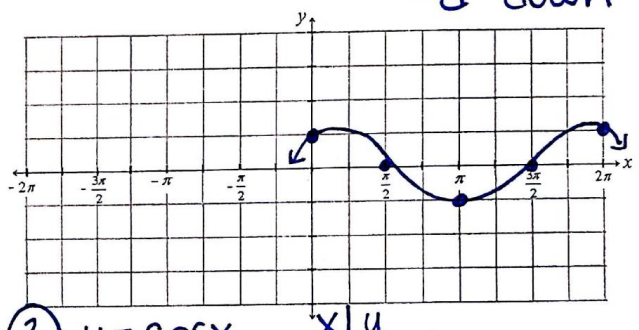


③ $y = 3\sin x$

MathBits.com

amp = 3

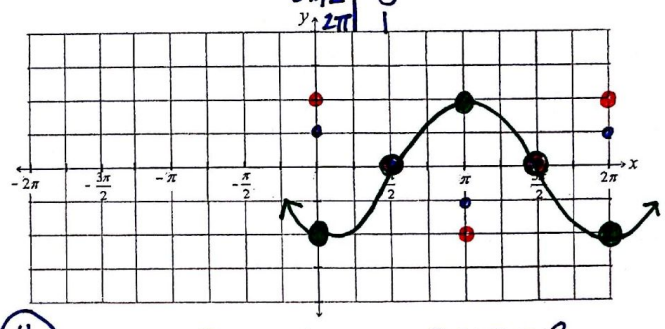
per = $\frac{2\pi}{1} = 2\pi$



② $y = \cos x$

clouds

x	y
0	1
π/2	0
π	-1
3π/2	0
2π	1



④ $y = -2\cos x$

MathBits.com

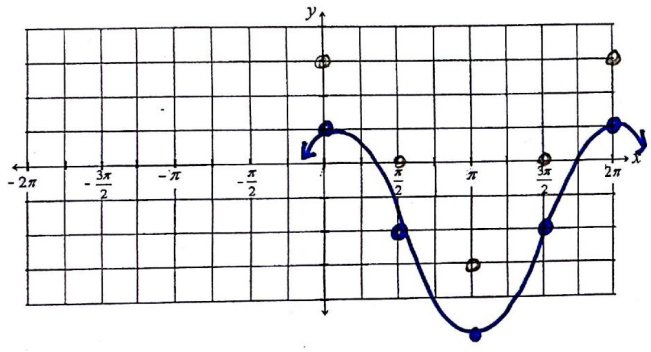
amp = 2

per = $\frac{2\pi}{1} = 2\pi$

reflects x-axis

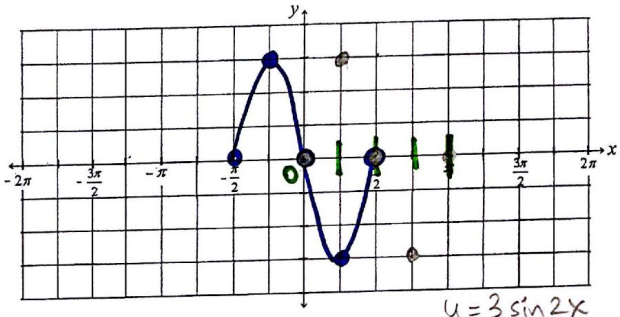
per = $\frac{2\pi}{2} = \pi$

⑦ $y = 3\cos x - 2$



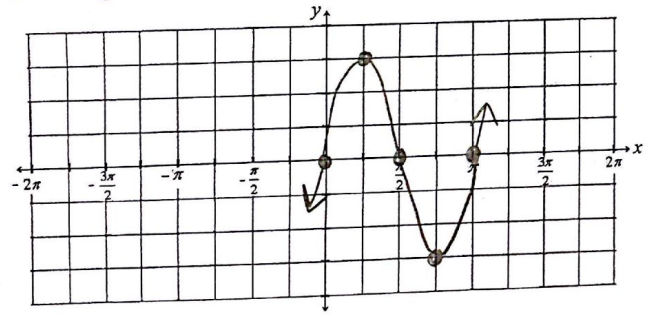
⑧ $y = 3\sin 2(x + \frac{\pi}{2})$

$y = 3\sin(2x + \pi)$



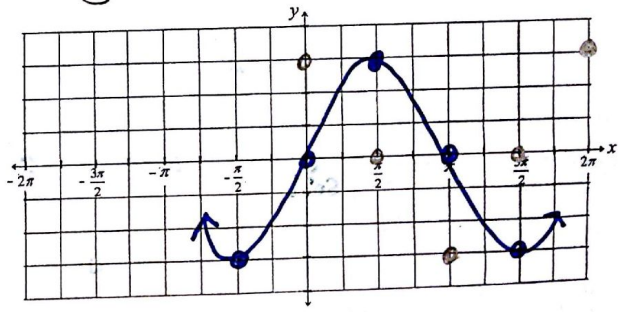
$y = 3\sin 2x$

⑤ $y = 3\sin(2x)$



per = $\frac{2\pi}{2} = \pi$

⑥ $y = 3\cos(x + \frac{\pi}{2})$



per = $\frac{2\pi}{1}$

Graphing Sine Functions -

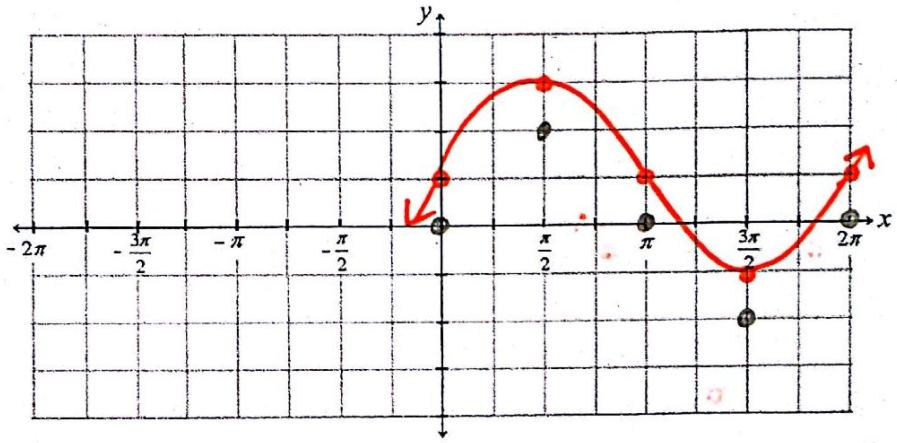
$2\sin x$

$y = 2\sin(x) + 1$

Amplitude = 2 Period = 2π Phase shift = none Vertical Shift = up 1

Find the 5 key points. Dive the period by 4 to get the quarter period. We start with the value of x where the cycle begins.

$x_1 = 0$	$x_2 = \pi/2$	$x_3 = \pi$	$x_4 = 3\pi/2$	$x_5 = 2\pi$
$y_1 = 0$	$y_2 = 2$	$y_3 = 0$	$y_4 = -2$	$y_5 = 0$



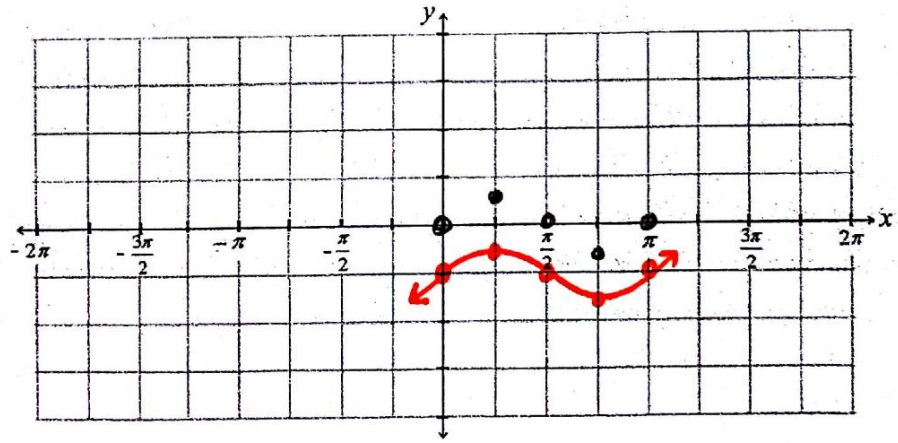
$\frac{1}{2}\sin(2x)$

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

Amplitude = 1/2 Period = π Phase shift = none Vertical Shift = down 1

Find the 5 key points. Dive the period by 4 to get the quarter period. We start with the value of x where the cycle begins.

$x_1 = 0$	$x_2 = \pi/4$	$x_3 = \pi/2$	$x_4 = 3\pi/4$	$x_5 = \pi$
$y_1 = 0$	$y_2 = 1/2$	$y_3 = 0$	$y_4 = -\frac{1}{2}$	$y_5 = 0$



Class

Graphing Sine Functions - Homework

Key

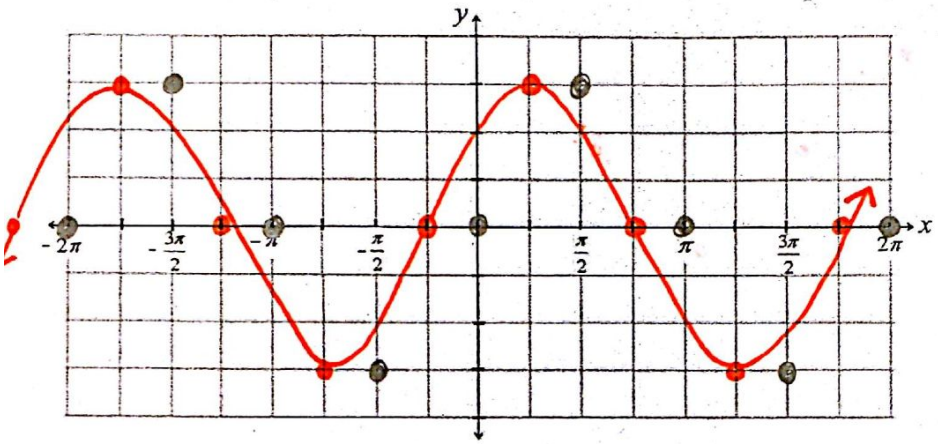
$y = 3\sin\left(x + \frac{\pi}{4}\right)$ 3sinx

Amplitude = 3 Period = 2π Phase shift = left π/4 Vertical Shift = none

Find the 5 key points. Dive the period by 4 to get the quarter period. We start with the value of x where the cycle begins.

$x_1 = 0$ $x_2 = \pi/2$ $x_3 = \pi$ $x_4 = 3\pi/2$ $x_5 = 2\pi$

$y_1 = 0$ $y_2 = 3$ $y_3 = 0$ $y_4 = -3$ $y_5 = 0$



y=sin(2x)

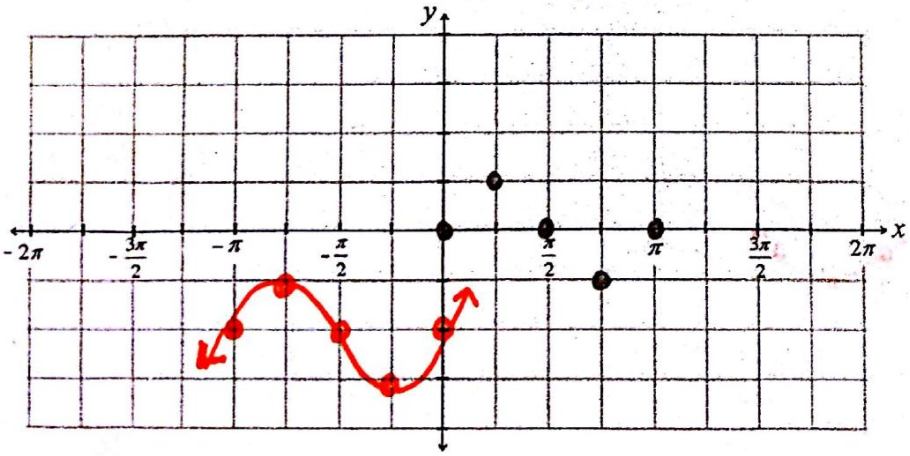
$y = \sin 2(x + \pi) - 2$

Amplitude = 1 Period = π Phase shift = left π Vertical Shift = down 2

Find the 5 key points. Dive the period by 4 to get the quarter period. We start with the value of x where the cycle begins.

$x_1 = 0$ $x_2 = \pi/4$ $x_3 = \pi/2$ $x_4 = 3\pi/4$ $x_5 = \pi$

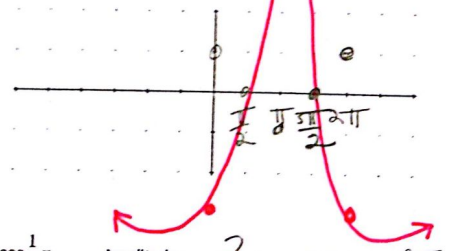
$y_1 = 0$ $y_2 = 1$ $y_3 = 0$ $y_4 = -1$ $y_5 = 0$



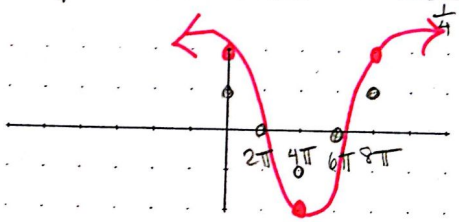
Class KEY

Graphing Cosine ~~Practice~~ work

1. $y = -3\cos x$ Amplitude: 3 Period: 2π

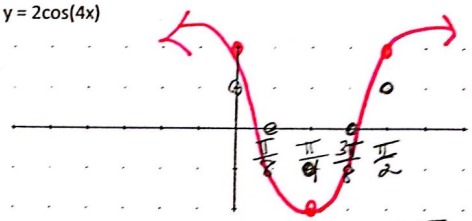


2. $y = 2\cos\frac{1}{4}x$ Amplitude: 2 Period: $\frac{2\pi}{\frac{1}{4}} = 8\pi$



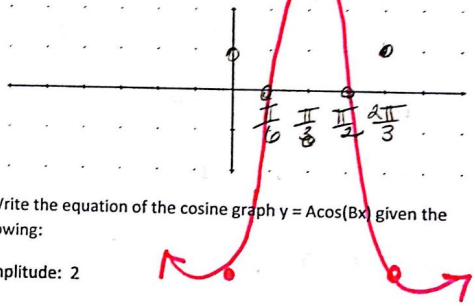
2 $\frac{2\pi}{4} = \frac{\pi}{2}$

3. y = 2cos(4x)



4. y = -4cos(3x)

4 $\frac{2\pi}{3}$



5. Write the equation of the cosine graph y = Acos(Bx) given the following:

Amplitude: 2

Period: $\frac{\pi}{3}$

$\frac{2\pi}{b} = \frac{\pi}{3}$

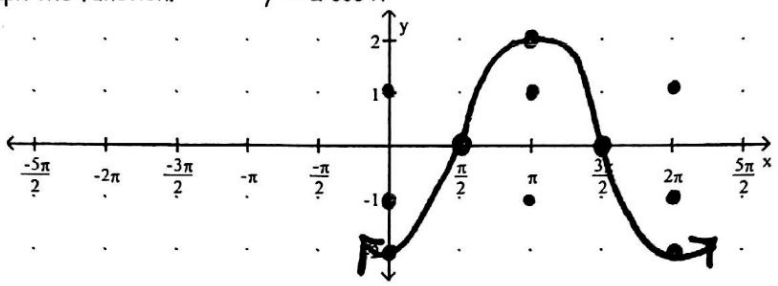
$\pi b = 6\pi$

$b = 6$

$y = 2\cos(6x)$

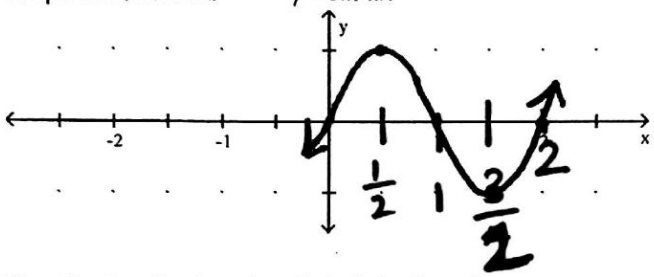
. . Graphing Sine and Cosine Function Name Key

1) Graph the function. $y = -2\cos x$



Amp: 2
Period: 2π
reflect over x-axis

2) Graph the function. $y = \sin \pi x$



Amp: 1
Period: $\frac{2\pi}{\pi} = 2$

3) Give the Amplitude and period of the function:

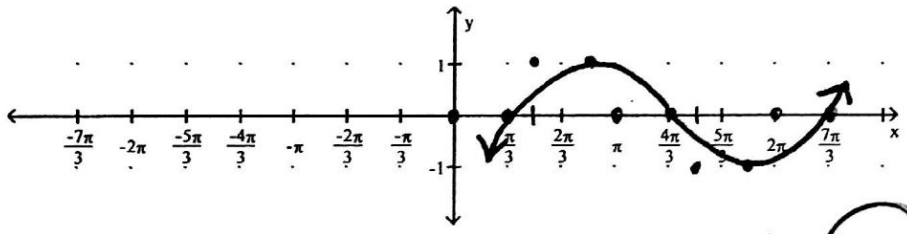
a) $y = \cos 3x$

Amp: 1 Period: $\frac{2\pi}{3}$

b) $y = 5 \sin \frac{1}{4}x$

Amp: 5
Period: 8π

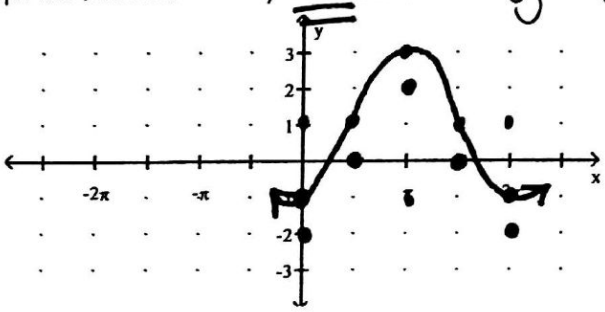
4) Graph the function. $y = \sin(x - \frac{\pi}{3})$



Amp: 1
Period: 2π
Phase shift: $\frac{\pi}{3}$

5) Graph the function. $y = 1 - 2\cos x$

$y = -2\cos x + 1$



Amp: 2
Period: 2π
Phase shift: none
vertical shift: up 1
reflect over x-axis