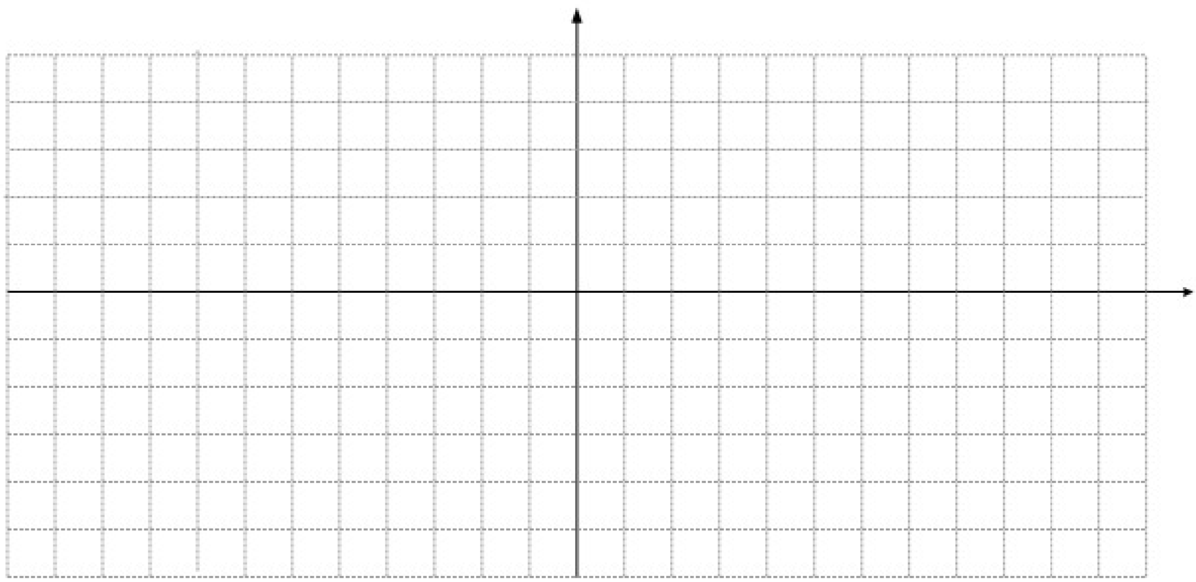
Chapter 6.4 Graphing Trigonometric Functions

Fill out the table with exact values.

x (Deg)	0	30	45	60	90	120	135	150	180	210	225	240	270	300	315	330	360
x (Rad)																	
sin(x)																	
cos(x)																	

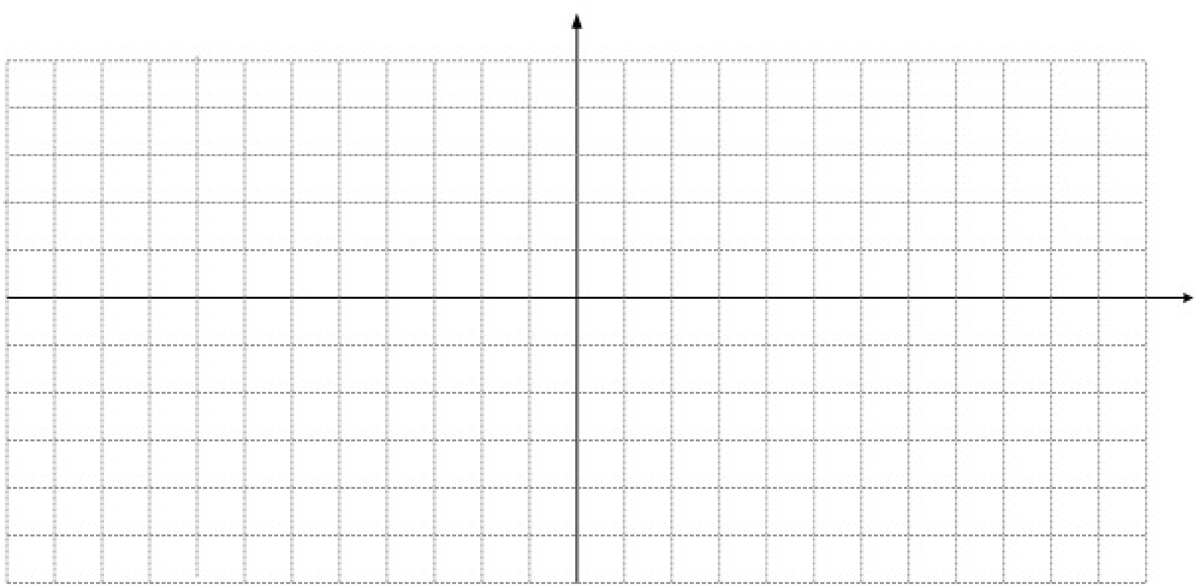
Graph the sin(x) over the interval [0, 2π]. Then use the fact that sine is odd to graph it over [-2π, 0].

f(x) = sin(x)



Graph the cos(x) over the interval [0, 2π]. Then use the fact that cosine is even to graph it over [-2π, 0].

f(x) = cos(x)



What do you notice about the graphs of sine and cosine?

Sinusoidal Axis – The horizontal line on which the graph "hangs". For f(x) = sin(x) and g(x) = cos(x), the sinusoidal axis is y = 0. Just like in algebra, f(x) + D shifts the graph vertically D units.

Graph the following:

a(x) = sin(x) + 3 c(x) = cos(x) + 7

b(x) = sin(x) -4 d(x) = cos(x) -5

Each of the following was of the form f(x) = sin(x) + D and g(x) = cos(x) + D. In general how do you find the sinusoidal axis from the equation?

Graphs of sine and cosine rise to a maximum then descend to a minimum.

Amplitude – The maximum distance the graph gets from the sinusoidal axis (not the distance between the maximum and minimum).

y = -f(x) is reflection of f(x) over the x axis.

Graph the following. Pay attention to the amplitude and if the graph heads uphill or downhill from (0,0).

y = 3sin(x) y = -2cos(x) - 3

y = 4sin(x) + 3 y = -5cos(x) + 1

Each of the functions was of the form y = Asin(x) + D and y = Acos(x) + D. What does the value of A tell you about the graph?

How can you find the y-value of the maximum and minimum of the graph in terms of A and D?

Period – The subset of the domain in which the range cycles before it repeats. y = sin(x) and y = cos(x) have a period of what?

Just like you can vertically stretch the graph of f(x) = Asin(Bx) + D by increasing the amplitude, you can horizontally stretch the graph of f(x) by making the value of B closer to zero. The period of a trigonometric function depends on the coefficient in front of x, B. The **period** of f(x) is **2π/B**.

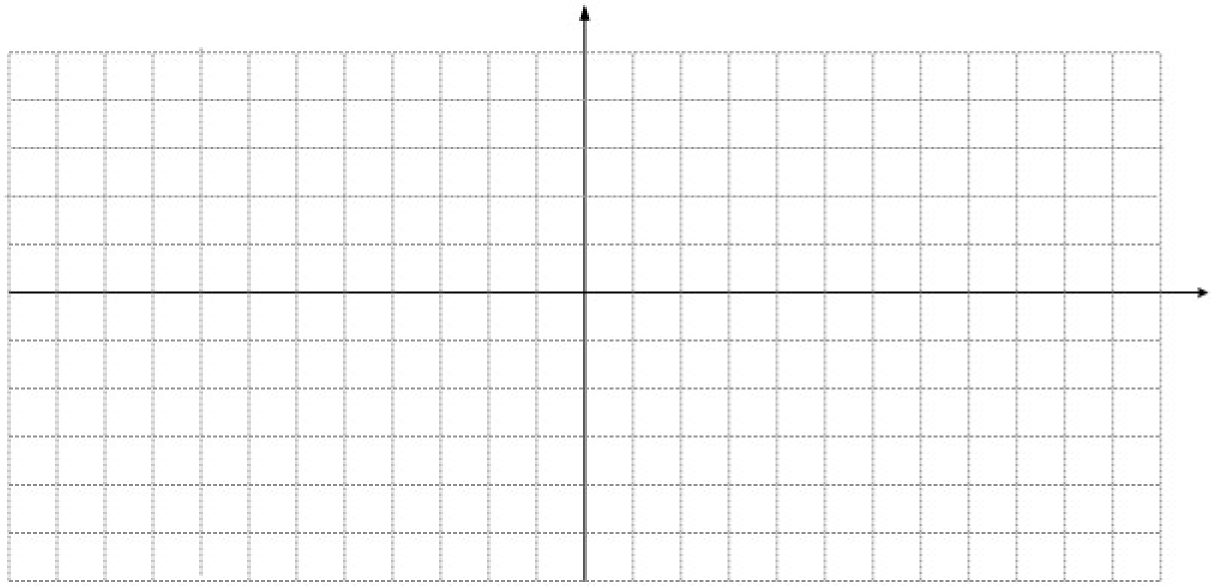
Graph the following.

e(x) = 3sin(x/2) – 1 f(x) = 2cos(4x) + 3

g(x) = -5sin(3x/2) h(x) = 4cos(πx) - 3

Graphing sin(x) and cos(x) Practice

1) y = 3sin(x) – 2



A = ____________

B = ____________

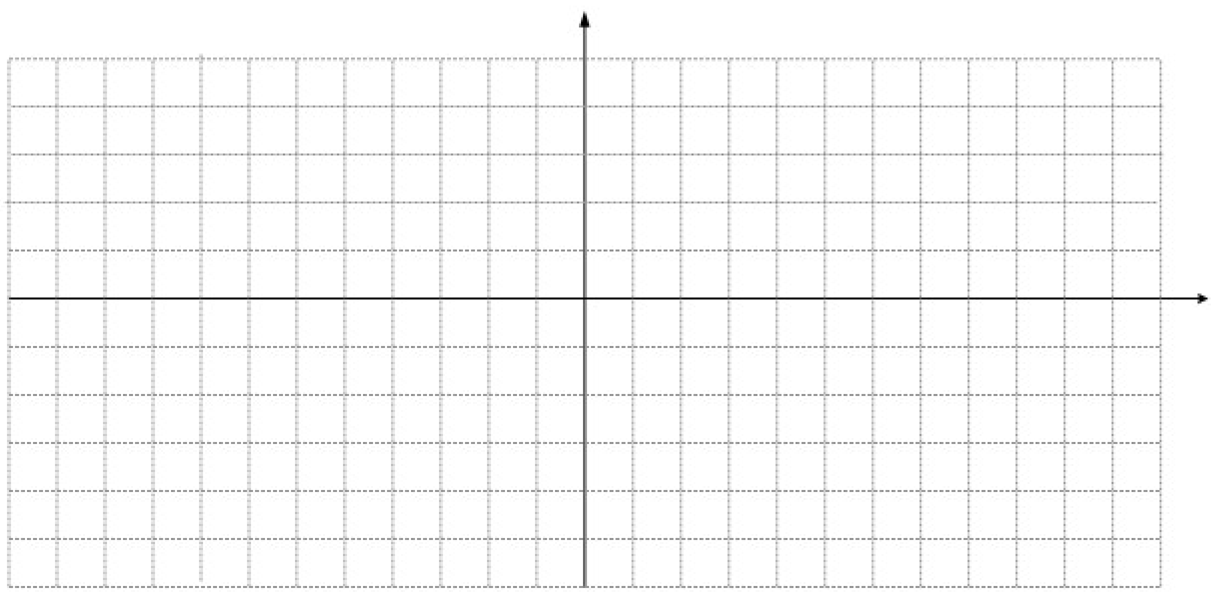
Period = ________

S.A.: y = ________

Domain: _______

Range : ________

2) f(x)= 2cos(3x)+ 1



A = ____________

B = ____________

Period = ________

S.A.: y = ________

Domain: _______

Range : ________

3) **$y = -2\sin(x/2) + 3$**

A = ____________

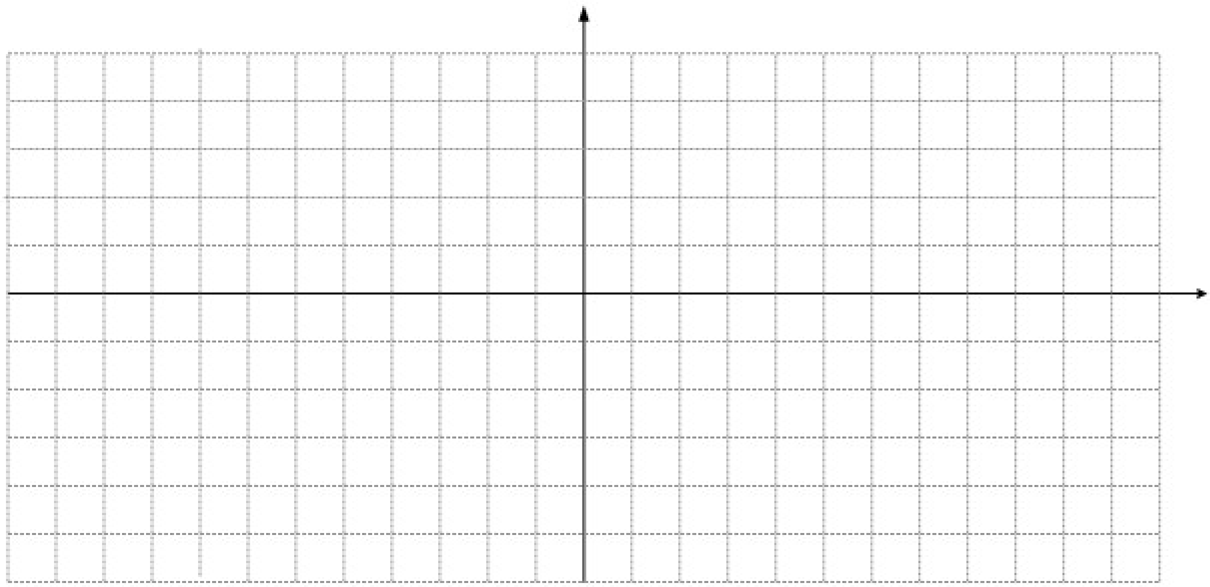
B = ____________

Period = ________

S.A.: y = ________

Domain: _______

Range : ________



4) **$g(x) = 3\cos(2x) + 1$**

A = ____________

B = ____________

Period = ________

S.A.: y = ________

Domain: _______

Range : ________