

Name \_\_\_\_\_

Date \_\_\_\_\_

### Graphs Dealing with Sine and Cosine Problems - Guided Lesson Explanation

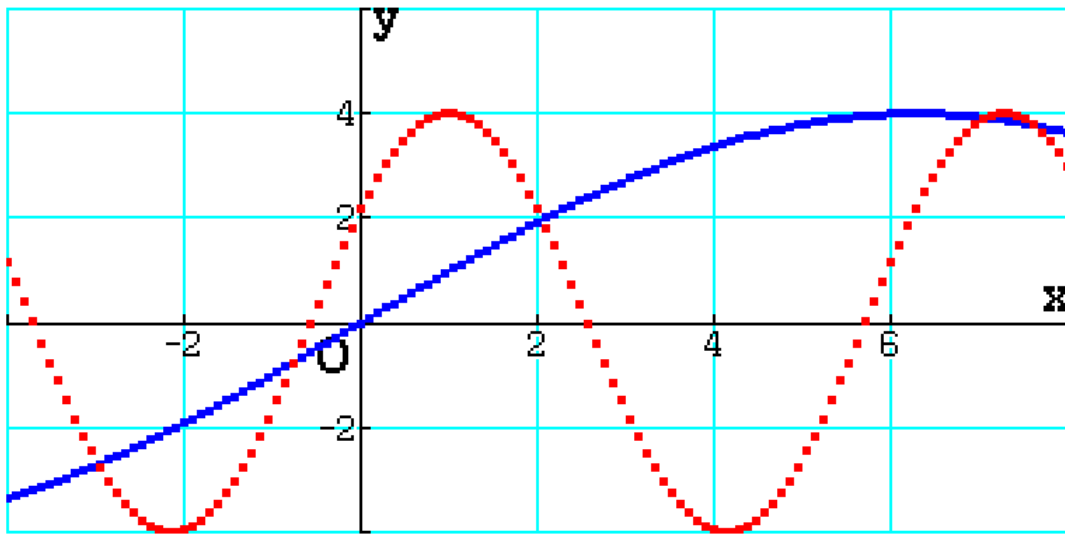
#### Explanation#1

Step 1) First we have to ask what is being asked.

"On, the same set of axis from 0 to  $2\pi$ , graph  $y = 4 \sin(1/4*x)$  and  $y = -4\cos(x-1)$ ."

Step 2) Now, we will graph the first equation.

Step 3) Then, we will graph the second equation.



Answer is: This is the required graph.



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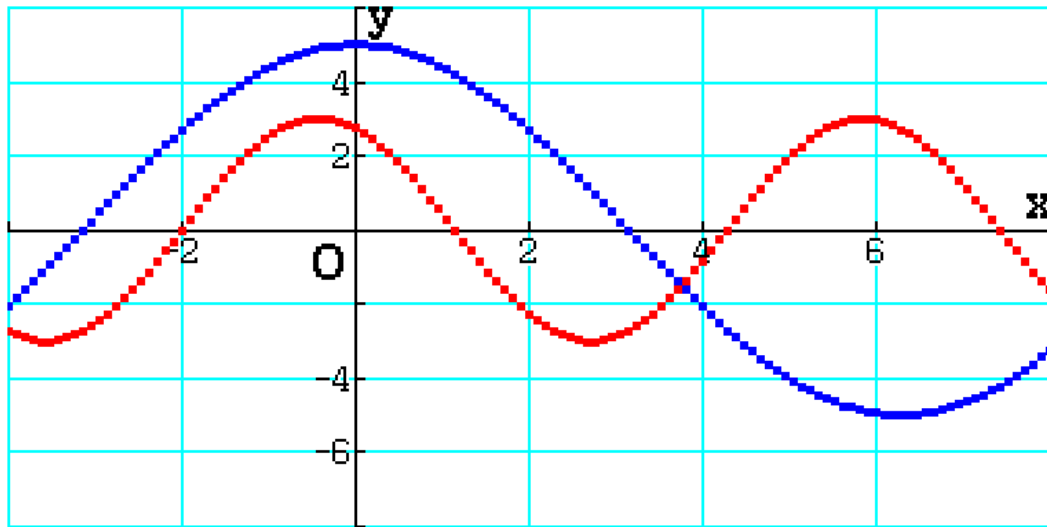
## Explanation#2

Step 1) First we have to ask what is being asked.

“On, the same set of axis from 0 to  $2\pi$ , graph  $y = 4 \sin (1/4*x)$  and  $y = -4\cos(x-1)$ .”

Step 2) Now, we will graph the first equation.

Step 3) Then, we will graph the second equation.



Answer is: This is the required graph.



**Explanation#3****Step 1) Identify if it is a sine or cosine graph.**

The sine curve usually starts near or close to a 0 y-intercept and increase.

The cosine curve usually starts high on the y-intercept and drops down.

Based on this graph starting high on the y-intercept and falling thereafter, we would say that this is a cosine curve.

**Step 2) Identify the equation you are working with.**

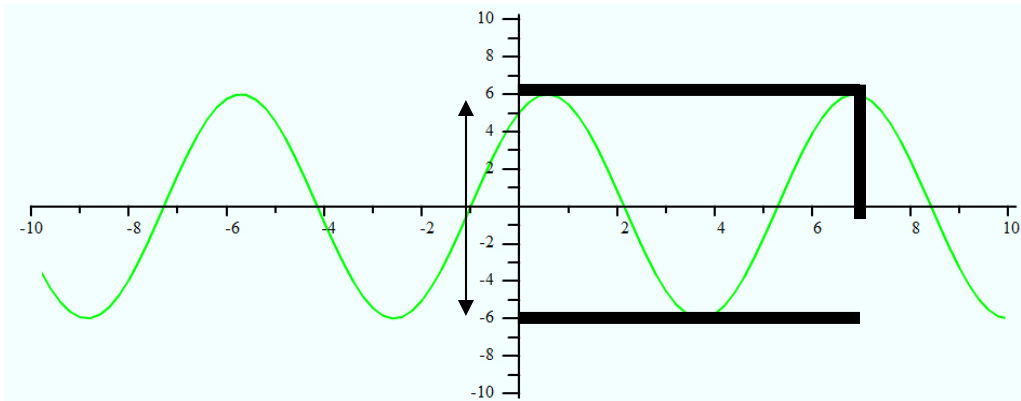
Since we are working with the cosine, it follows that this is the equation that we would be using:

$$y = A \cos (Bx)$$

At this point our question is what is A and what is B.

**Step 3) Find a point to work with and the amplitude of the wave.**

We need to identify a non-zero point on this graph clearly.



a. It looks like the point 7, 6 is clear.

b. We can also see a clear amplitude from  $y = 6$  to  $y = -6$  from a total of 6.

Our equation now looks like this:

$$Y = 6 \cos (Bx)$$



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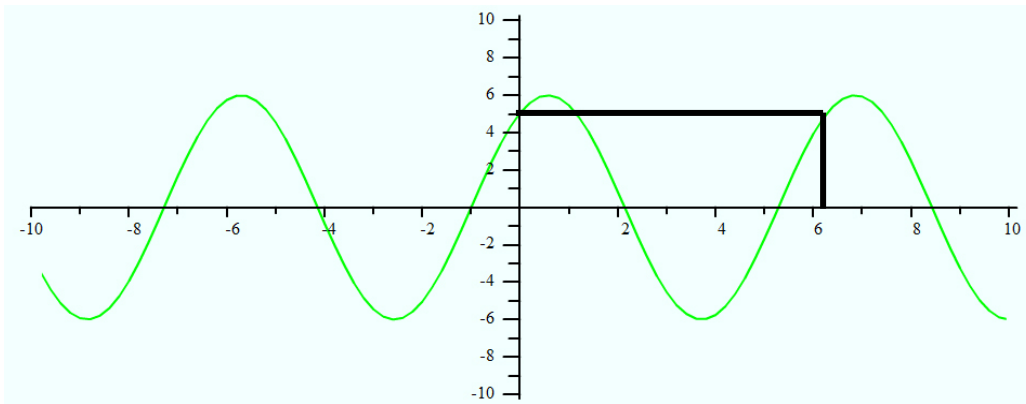
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**Step 4) Determine the period of the function.**

The period can be found by using the equation:

$$\text{Period} = \frac{2\pi}{B}$$

The period is where wave completes a full cycle. Start high on y-intercept and comes back to high.



In this case it looks like the period is about a 6.3.

Solving for B:

$$6.3 = \frac{2\pi}{B}$$

$$6.3(b) = 2\pi$$

$$b = 2\pi / 6.3$$

$$b = \sim 1$$

**Step 5) Put a and b into the equation to finalize it.**

$$Y = 6 \cos (x)$$

