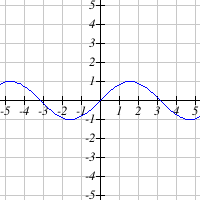
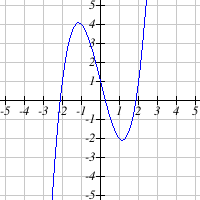
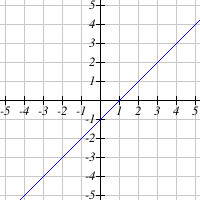
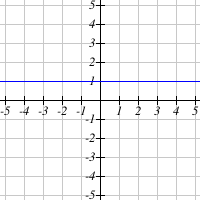
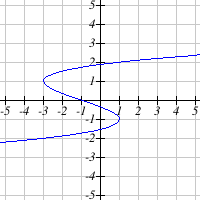
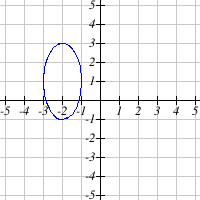
**Business Math Week 1 Additional Notes/Notation**

**Definition:** A function is a relationship (x,y) so that for every value of x there can be only one value of y. On a graph we call this the vertical line test.

These are all functions.

These two graphs are not functions (because they fail the vertical line test).

Given a table of (x,y) values, we can tell if a relationship is a function, and then also is it “one-to-one” if each “x” value appears once and each “y” value also only appears once!

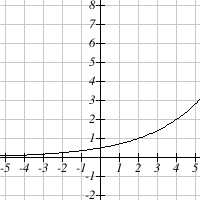
|  |  |  |  |
| --- | --- | --- | --- |
|  | 3 | 10 | 12 |
|  | 4 | 7 | 14 |
|  |  |  |  |
|  | 3 | 10 | 12 |
|  | 4 | 7 | 7 |
|  |  |  |  |
|  | 3 | 10 | 10 |
|  | 4 | 7 | 14 |

< -- here we see an example of a function that is also one-to-one

< -- here we see a function, but it is not one-to-one because 7 repeats

< -- here we see a relationship that is not a function.

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The plot below represents the function   
  
 First let’s list some (x,y) points from the graph.

We can estimate if needed.

(0, ½) is on the graph. This means we say “f(0)=1/2”

(2, 1) and (4, 2) are also on the graph.

Anything more we’d have to estimate.

When we ask “what is f(2)” we are looking for the y value when x = 2. Looking at the points we listed, we have (2, 1)  
  
 1

When asked to solve , we are looking for a point ( **?** , 2 ). In other words, it is y = 2, what is x ? Looking at points we listed above, we have ***(4, 2)***  
For f(x) = 2 , ***this is really saying*** y = 2. Therefore, the answer is:  = 4

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|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| =y | 96 | 68 | 7 | 1 | 94 | 58 | 51 | 36 | 85 | 25 |

What if we have a table?   
  
Evaluate Solve f(x) = 1 (same thing as y = 1)  
  
 = y when x is 7 = 36 x = 3 (look for an x that is paired with 1)

**Evaluate** and **Solve** (what is the difference):

When , evaluate

“Evaluate” means use the formula and calculate the value  
  
   = = 246

Given . When convenient we use “y” in place of “f(x)”.  
  
Solve “Solve” also means to calculate a value. We are “solving” for x.

which means

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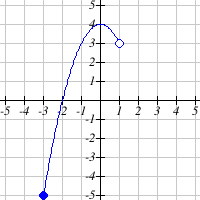
Here is another time we are asked to evaluate something.

The total cost (in dollars) to produce units of a good is given by the function:

units? Answer:   
  
Cost = $ 90,990

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**Domain/Range**

Find the domain and range of the function graphed below.  
  
Domain:

left is a [ and on the right is )...

Range:  lower and upper are both included, so [ and ]

Answer:

With practice this gets easier...

***The following will only be on the Week 1 quiz. You will not see these on the test or on future tests/quizzes. It’s only so you can have some experience with it.***

Given a split function, what does this mean?

“” means “x is negative” and “” means “x is 0 or positive”

More descriptive way of stating this function:

IF x is negative, choose the equation **y = 8x + 9**

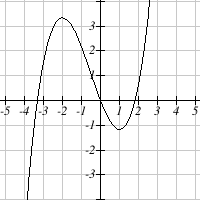
Otherwise, IF x is 0 or x is positive, choose the equation **y = 8x + 18**  
  
Some examples of how this works:  
 ? **x is**  so we choose **y = 8x + 9**.

Answer:

These two values of x are 0 and positive, so choose the equation

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**Increasing/Decreasing Always use ( )**  
  
The function graphed is:  
  
Increasing on the interval(s)    
  
 When the graph goes off the page we assume infinity, either or

Decreasing on the interval(s)  

Increasing is “going up” from left to right.

Decreasing is “going down” from left to right.