How to Shift Function Graphs: Function Transformations

Here are very helpful formulas when shifting graph functions:

1. To shift graph functions to the left:

We will be adding inside the function:

$y= f(x+b)$

2. Shift to the right:

We will be subtracting inside the function:

$y= f(x-b)$

3. To shift graph up some units:

We would be adding outside the function:

$y= f(x)+b$

4. To shift graph down some units:

We will be subtracting outside the function:

$y= f(x)-b$

Let's do an example!

We would be using the basic quadratic function of: y= x^2

1. To shift y=x^2 two units to the left:

We would be adding inside the function of y= x^2. So, y = (x+2)^2.

2. To shift y= x^2 two units to the right:

We would be subtracting inside the function of y= x^2. So, y= (x-2)^2.

3. To shift y=x^2 two units up:

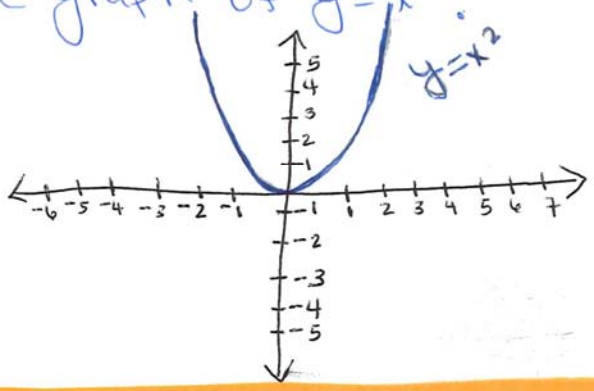
We would be adding outside the function of y=x^2. So, y= x^2 +2.

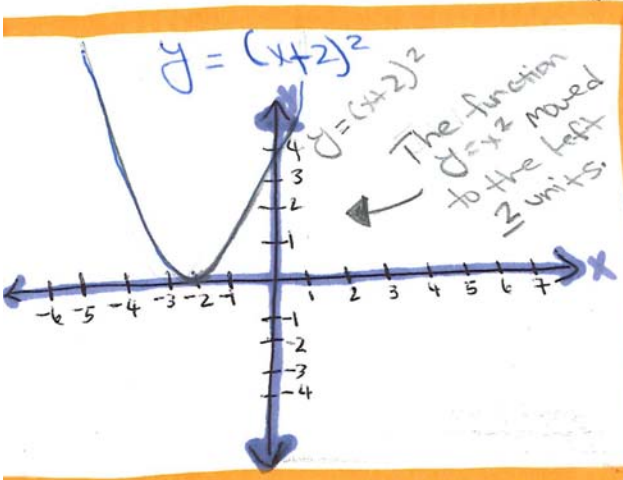
4. To shift y=x^2 two units down:

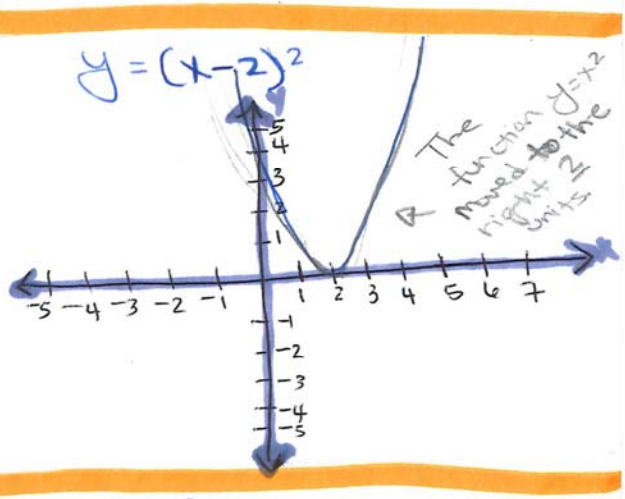
We would be subtracting outside the function of y= x^2. So, y=x^2 -2.

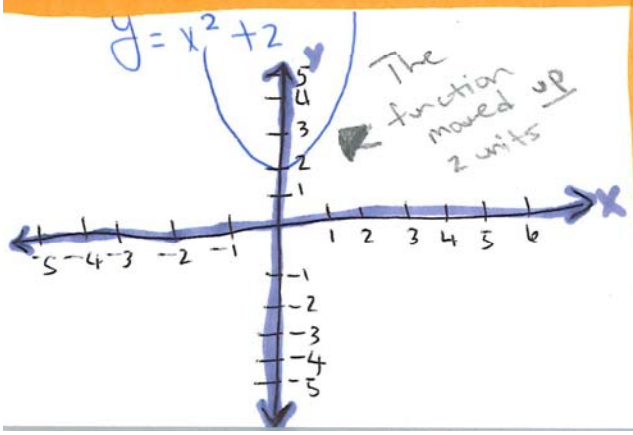
Here's a view of the graph transformations for $y = x^2$:

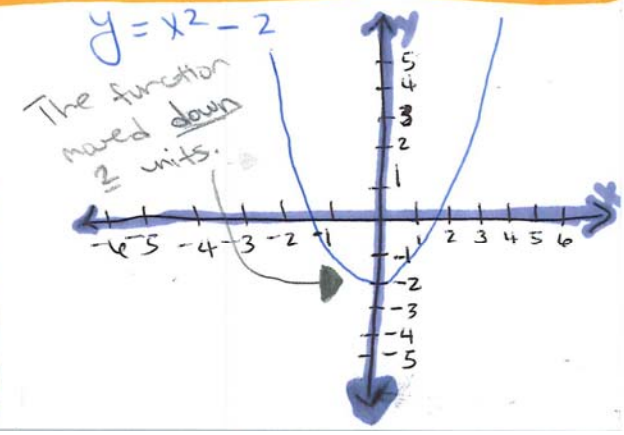
Here's the graph of $y = x^2$:











Now let's try another example!!

But, now we would use the negative of the y=x^2. We would use: y= -x^2.

1. To shift y=-x^2 two units to the left:

We would be adding inside the function of y= -x^2. So, y = -(x+2)^2.

2. To shift y= -x^2 two units to the right:

We would be subtracting inside the function of y= -x^2. So, y= -(x-2)^2.

3. To shift y=-x^2 two units up:

We would be adding outside the function of y= -x^2. So, y= -x^2 +2.

4. To shift y=-x^2 two units down:

We would be subtracting outside the function of y= -x^2. So, y= -x^2 -2.

Now, try these on your own:

Tip: You can also try one a day!

1. y = x + 3
2. y = x - 6
3. y = x^2 + 6
4. y = -x^2 - 8
5. y = -x^2 + 12
6. y = x^3 + 2
7. y = -x^3 + 8
8. y = -x^3 - 12

Good luck and happy learning and reviewing!!

Also: don't forget, if you have a graphing calculator use it to check your graph functions.

Answers on the next two pages! So you can check your answers! ☺