Advanced Algebra

Unit 2: Family of Functions

The MAJOR note for this unit is knowing very well the following:

> **y= a(x-h) + k**
> "a" is a vertical stretch or shrink
> "h" moves the graph to the left or right. You are responsible to know which direction by looking at the function! (x-6) moves the graph 6 units to the RIGHT! (x+4) moves the graph 4 units to the Left
> "k" moves the graph up or down. This number is true to what you see.

PARENT FUNCTIONS	Family it belongs to.	Vertex or starting point of the graph	Translation	Family it belongs to.	Vertex or starting point?
Y=2x	Linear		f(x)=3x+6	Linear	
$f(x) = x^2$	Quadratic		$f(x)=(x-4)^2 + 6$	Quadratic	
$f(x) = x^3$	Cubic		$f(x)= x^3 +2$	Cubic	
$f(x) = |x|$	Absolute Value		$f(x) = |x - 3|$	Absolute Value	
$f(x) = \sqrt{x}$	Square root		$f(x) = \sqrt{(x - 3)}$	Square root	
$f(x) = \sqrt[3]{x}$	Cube Root		$F(x) = \sqrt[3]{(x + 2)} +4$		
$f(x) = \frac{1}{x}$	Reciprocal		$F(x) = \frac{1}{(x-2)}$		

The parent function is y=x². Write an equation for each of the new quadratics.

1) The parabola is translated down 5 units.
2) The parabola is translated up 3 units.
3) The parabola is translated right 3 units.
4) The parabola is translated left 4 units.

I can work with function notation.

For the following problems f(x) = x². Describe the location of the parabola relative to the graph of

f(x) = x².

1) y= f(x) -3
2) y=f(x) +4

3) y=f(x-2)
4) y= f(x+4)

Describe what happens to the graph of y = x^2 in the following situations.

a) x is replaced with (x-3)
b) x is replaced with (x+3)
c) y is replaced with (y-2)
d) y is replaced with (y+2)

I can evaluate composition of functions.

Given f(x) = 3x+2 and g(x) = x^2 answer the following questions:

f(4)

g(-5)

f(g(2))

g(f(0))

f(g(x))

g(f(x))

g(f(x+1))

f(g(x+2))