Transformations of Graphs

Name: _____ Class: _____

Parent Function: A basic function used as a building block for a more complicated function.

Use your calculator to draw sketches of each parent function and the corresponding functions given in the table below. Predict the graph for $k(x)$ and then check your prediction on your calculator. Color code each graph.

Transformation #1: _____

Parent Function	Transformations	Sketch	Describe it!
Linear: $f(x)=x$	$g(x)\rightarrow f(x)+4$ **Equation: _____** ☐ $h(x)\rightarrow f(x)-2.5$ **Equation: _____** ☐ $k(x)\rightarrow f(x)+1$ **Equation: _____** ☐		
Quadratic: $f(x)=x^2$	$g(x)\rightarrow f(x)+4$ **Equation: _____** ☐ $h(x)\rightarrow f(x)-2.5$ **Equation: _____** ☐ $k(x)\rightarrow f(x)+1$ **Equation: _____** ☐		
Exponential: $f(x)=2^x$	$g(x)\rightarrow f(x)+4$ **Equation: _____** ☐ $h(x)\rightarrow f(x)-2.5$ **Equation: _____** ☐ $k(x)\rightarrow f(x)+1$ **Equation: _____** ☐		
Absolute Value: $f(x)=\lvert x\rvert$	$g(x)\rightarrow f(x)+4$ **Equation: _____** ☐ $h(x)\rightarrow f(x)-2.5$ **Equation: _____** ☐ $k(x)\rightarrow f(x)+1$ **Equation: _____** ☐		

What does $f(x)\rightarrow f(x)+k$ do to the graph of the function?

If the graph of $f(x)=3x^2-2x+7$ was shifted down four units, what would the equation of the transformed graph be?

Transformation #2: _____

Parent Function	Transformations	Sketch	Describe it!
Square Root: $f(x)=\sqrt{x}$	$g(x) \rightarrow f(x+4)$ **Equation: _____** ☐ $h(x) \rightarrow f(x-2.5)$ **Equation: _____** ☐ $k(x) \rightarrow f(x+1)$ **Equation: _____** ☐		
Quadratic: $f(x)=x^2$	$g(x) \rightarrow f(x+4)$ **Equation: _____** ☐ $h(x) \rightarrow f(x-2.5)$ **Equation: _____** ☐ $k(x) \rightarrow f(x+1)$ **Equation: _____** ☐		
Exponential: $f(x)=2^x$	$g(x) \rightarrow f(x+4)$ **Equation: _____** ☐ $h(x) \rightarrow f(x-2.5)$ **Equation: _____** ☐ $k(x) \rightarrow f(x+1)$ **Equation: _____** ☐		
Absolute Value: $f(x)=\lvert x \rvert$	$g(x) \rightarrow f(x+4)$ **Equation: _____** ☐ $h(x) \rightarrow f(x-2.5)$ **Equation: _____** ☐ $k(x) \rightarrow f(x+1)$ **Equation: _____** ☐		

What does $f(x) \rightarrow f(x+k)$ do to the graph of the function?

If the graph of $f(x)=\sqrt{x+5}$ was shifted right three, what would the equation of the transformed graph be?

Transformation #3: _____

Parent Function	Transformations	Sketch	Describe it!
Linear: $f(x)=x$	$g(x)\to 4f(x)$ **Equation: _____** ☐ $h(x)\to -2.5f(x)$ **Equation: _____** ☐ $k(x)\to 0.2f(x)$ **Equation: _____** ☐		
Quadratic: $f(x)=x^2$	$g(x)\to 4f(x)$ **Equation: _____** ☐ $h(x)\to -2.5f(x)$ **Equation: _____** ☐ $k(x)\to 0.2f(x)$ **Equation: _____** ☐		
Exponential: $f(x)=2^x$	$g(x)\to 4f(x)$ **Equation: _____** ☐ $h(x)\to -2.5f(x)$ **Equation: _____** ☐ $k(x)\to 0.2f(x)$ **Equation: _____** ☐		
Absolute Value: $f(x)=\lvert x\rvert$	$g(x)\to 4f(x)$ **Equation: _____** ☐ $h(x)\to -2.5f(x)$ **Equation: _____** ☐ $k(x)\to 0.2f(x)$ **Equation: _____** ☐		

What does $f(x)\to kf(x)$ do to the graph of the function?

Transformation #4: _____

Parent Function	Transformations	Sketch	Describe it!
Quadratic: $f(x)=x^2$	$g(x)\rightarrow f(4x)$ **Equation: _____** ☐ $h(x)\rightarrow f(-2.5x)$ **Equation: _____** ☐ $k(x)\rightarrow f(0.2x)$ **Equation: _____** ☐		
Exponential: $f(x)=2^x$	$g(x)\rightarrow f(4x)$ **Equation: _____** ☐ $h(x)\rightarrow f(-2.5x)$ **Equation: _____** ☐ $k(x)\rightarrow f(0.2x)$ **Equation: _____** ☐		
Absolute Value: $f(x)=\lvert x\rvert$	$g(x)\rightarrow f(4x)$ **Equation: _____** ☐ $h(x)\rightarrow f(-2.5x)$ **Equation: _____** ☐ $k(x)\rightarrow f(0.2x)$ **Equation: _____** ☐		

What does $f(x)\rightarrow f\left(\frac{1}{k}x\right)$ do to the graph of the function?

If the original graph of a function is $f(x)=x^2$, describe all the transformations that change it to $f(x)=2(x-5)^2+1$.