Name:_____Class:_____Date:_____

Algebra 2 Transformations w/Linear, Absolute Value, Quadratic, and Radical Functions

On graph paper, make separate graphs for each problem. You may include the parent function on the graph if you want to do so. $g(x)$ represents the transformation of each parent function.

Parent Functions: Linear $f(x) = x$ Absolute Value $f(x) = |x|$

Quadratic $f(x) = x^2$ Radical $f(x) = \sqrt{x}$

1. Write in words what the transformation is.
2. Write four equations showing the transformation of each parent function.
3. Graph each function on a separate graph.
4. Identify the domain and range after you have graphed the transformation.

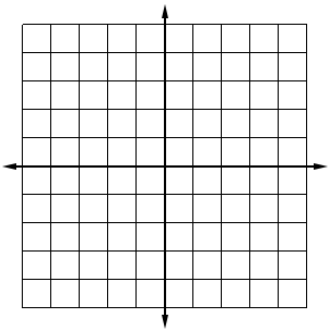
Order of Transformations (after you factor the b, if needed): #1 horizontal shift #2 shrink/stretch #3 reflection #4 vertical shift

EXAMPLE: $g(x) = \frac{1}{2}f(x - 5) + 3$ horizontal shift: shrink/stretch:

reflection: vertical shift:

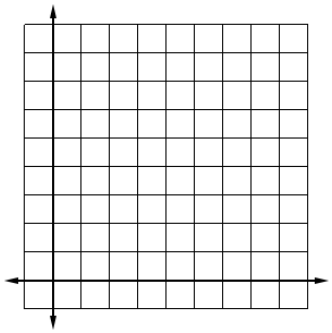
LINEAR: $g(x) = \frac{1}{2}(x - 5) + 3$

domain: all real numbers aka $(-\infty, \infty)$
range: all real numbers aka $(-\infty, \infty)$



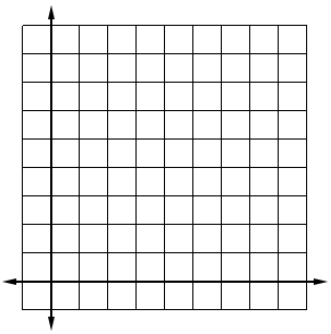
ABSOLUTE VALUE: $g(x) = \frac{1}{2}|x - 5| + 3$

domain: all real numbers aka $(-\infty, \infty)$
range: $y \geq 3$ aka $[3, \infty)$



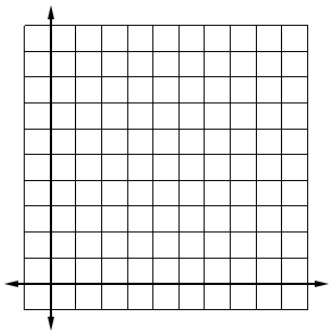
QUADRATIC: $g(x) = \frac{1}{2}(x - 5)^2 + 3$

domain: all real numbers aka $(-\infty, \infty)$
range: $y \geq 3$ aka $[3, \infty)$



RADICAL: $g(x) = \frac{1}{2}\sqrt{(x - 5)} + 3$

domain: $x \geq 5$ aka $[5, \infty)$
range: $y \geq 3$ aka $[3, \infty)$



Here are your problems! Remember: you are working FOUR functions per problem.

•Write in words what the transformation is.
•Write **four equations** showing the transformation of each parent function.
•Graph each function on a separate graph.
•Identify the domain and range after you have graphed the transformation.

1. $g(x) = 2f(x) + 3$

2. $g(x) = -f(x + 3)$

3. $g(x) = f(x - 4) + 1$

4. $g(x) = f(-x) - 3$

5. $g(x) = f(2x) - 4$

6. $g(x) = \frac{1}{3}f(x - 4) + 2$

There are 24 problems. We will work on these today and tomorrow. DO NOT wait until day two to start this. If I say it takes two days, then you need to use the time I've given. If we could do it in one, we would.