Graph each of the following by transforming a common function. State the domain and range of each. On the test, I will be giving you the LAST of the 3 functions, and you'll be expected to graph it in stages, starting with the common function and performing one move at each stage. I *do* permit stretching and reflecting to be done in one step. But the idea is to work part b. by making one change to part a. Work part c. by making one change to part b.

1. $f(x) = x^2$
   a. $g(x) = -2x^2$
   b. $g(x) = -2(x+5)^2$
   c. $g(x) = -2(x+5)^2 - 11$

2. $f(x) = \sqrt{x}$
   a. $g(x) = 4\sqrt{x}$
   b. $g(x) = 4\sqrt{x-3}$
   c. $g(x) = 4\sqrt{x-3} + 7$

3. $f(x) = x^3$
   a. $g(x) = -2x^3$
   b. $g(x) = -2(x+5)^3$
   c. $g(x) = -2(5-x)^3$

4. $f(x) = |x|$
   a. $g(x) = |x-7|$
   b. $g(x) = 3|x-7|$
   c. $g(x) = 3|x-7| + 2$

5. Linear functions are special, because you can move the constant multiple inside and out of the function so easily. To graph $g(x) = 3x$, using $f(x) = x$ as the basic function, you can view $g(x)$ as either $3f(x)$ (vertical stretch by a factor of 3) or as $f(3x)$ (horizontal *shrink* by a factor of 1/3). You can't do this with a square root function, $f(x) = \sqrt{x}$ because a $\sqrt{3x} = f(3x)$ is not the same as a $3\sqrt{x} = 3f(x)$.

   What I want you to do, here, is graph $g(x) = 3x + 2$ in *two* different ways:

   a. Viewing it as $3f(x) + 2$, where $f(x) = x$.
   b. Viewing it as $f(3x) + 2$, where $f(x) = x$.