Math 163A Class Drill 1: Using Transformations to Graph a Quadratic Function
The goal is to graph the function $f(x) = 5(x + 3)^2$ using transformations.

First Graph: $y = x^2$.
This is a basic graph that you should know.
On your graph, label the following key points:
(-3,9), (-2,4), (-1,1), (0,0), (1,1), (2,4), (3,9).

Second graph: $y = (x + 3)^2$.
Before making the graph, answer these questions.
- Is the 3 an additive constant or a multiplicative constant?
- Is the 3 on the inside or on the outside?
Based on your answers to questions 1 and 2, how does Handout 2 tell you to transform the first graph to get the second?

Write the coordinates of the seven new key points obtained by transforming the seven old key points from the first graph.

Now draw the graph of $y = (x + 3)^2$. Label the seven key points.

Third graph: $f(x) = 5(x + 3)^2$.
Before making the graph, answer these questions.
- Is the 5 an additive constant or a multiplicative constant?
- Is the 5 on the inside or on the outside?
Based on your answers to 1 and 2, how does Handout 2 tell you to transform the second graph to get the third?

Write the coordinates of the seven new key points obtained by transforming the seven old key points from the first graph.

Now draw the graph of $f(x) = 5(x + 3)^2$. Label the seven key points.