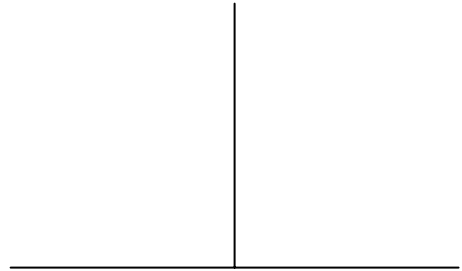NEW FUNCTIONS FROM OLD
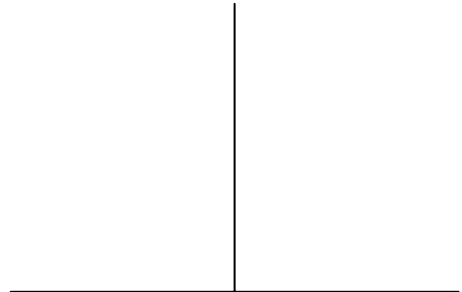
1. Graph $y = x^2 - 4x + 7$, $y = (x+3)^2 - 4(x+3) + 7$, and $y = (x-3)^2 - 4(x-3) + 7$ using the window [-4,9] x [0,9].

   a. How do these graphs differ? How are they similar?

   b. Given any function $y = f(x)$, what is the effect of the transformation $y = f(x - h)$? Include the sign of h.

2. Graph $y = x^2 - 4x + 7$, $y = (x^2 - 4x + 7) - 2$, and $y = (x^2 - 4x + 7) + 2$ using the window [-4,9] x [0,9].

   a. How do these graphs differ? How are they similar?

   b. Given any function $y = f(x)$, what is the effect of the transformation $y = f(x) + k$? Include the sign of k.
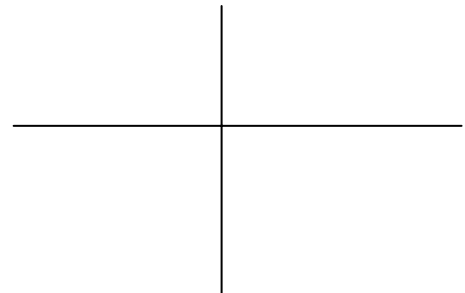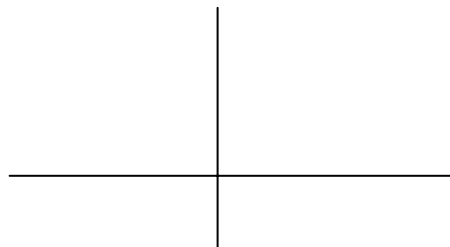
3. Graph $y = x^2 - 4x + 7$, $y = -(x^2 - 4x + 7)$, and $y = (-x)^2 - 4(-x) + 7$ using the window [-4,9] x [-9,9].

   a. How do these graphs differ? How are they similar?

   b. Given any function $y = f(x)$, what is the effect of the transformation $y = -f(x)$? The transformation $y = f(-x)$?

4. Graph $y = x^2$, $y = (2x)^2$, and $y = (0.4x)^2$ using the window [-8,8] x [-2,9].

   a. How do these graphs differ? How are they similar?

   b. Given any function $y = f(x)$, what is the effect of
      the transformation $y = f(cx)$? Include the size of c.

5. Graph $y = x^2$, $y = 2.5x^2$, and $y = 0.3x^2$ using the window [-8,8] x [-2,9].

   a. How do these graphs differ? How are they similar?

   b. Given any function $y = f(x)$, what is the effect of
      the transformation $y = c \cdot f(x)$? Include the size of c.
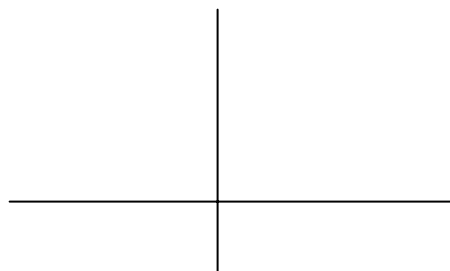
   c. Compare the graphs of $y = 2.5x^2$ and $y = \left(\sqrt{2.5}x\right)^2$.

6. How would the graph of $y = -3f(x+5) - 4$ compare to $y = f(x)$?

7. Write an expression that would represent a graph of $y = f(x)$ that has been shifted right 2 units
   and then reflected across the y-axis. Does the order matter?