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 \([-4,9] \times [0,9]\).
   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 \([-4,9] \times [0,9]\).
   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 \([-4,9] \times [-9,9]\).
   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 \([-8, 8] \times [-2, 9]\).

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 \([-8, 8] \times [-2, 9]\).

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 \( y = (\sqrt{2.5}x)^2 \).

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