Name: ______________________________ Date: ____________________

BLM 3–4

Section 3.1 Extra Practice

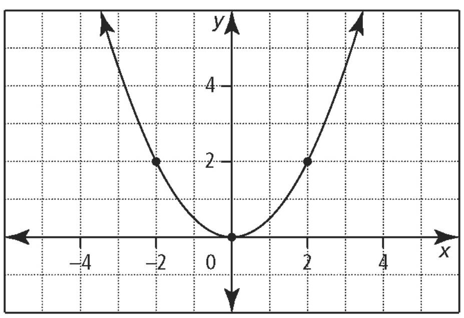
1. Explain how the graph of each function can be obtained from the graph of $f(x) = x^2$. For each graph, identify the direction of opening, whether it has a maximum or a minimum value, and the range.

a) $f(x) = 3x^2$ **b)** $f(x) = -5x^2$
c) $f(x) = x^2 + 8$ **d)** $f(x) = x^2 - 5$

2. Explain how the graphs of each pair of functions are related. Sketch the graph of the second function in each pair, and determine its vertex, axis of symmetry, domain, range, and any intercepts.

a) $y = x^2$ and $y = (x - 6)^2$
b) $y = x^2$ and $y = (x + 1)^2$
c) $y = x^2$ and $y = (x + 4)^2 + 3$
d) $y = x^2$ and $y = (x - 2)^2 - 1$

3. a) Write a quadratic function in vertex form for the parabola shown on the graph.



b) Suppose the parabola is reflected about the x-axis. Write the quadratic function in vertex form of the new parabola.
c) Suppose the parabola in the graph is translated 6 units to the left. Write the quadratic function in vertex form of the new parabola.
d) Suppose the parabola in the graph is translated 3 units down. Write the quadratic function in vertex form of the new parabola.

4. Describe how the graph of each function can be sketched using transformations.

a) $f(x) = (x + 7)^2 - 3$ **b)** $f(x) = -2x^2 + 5$
c) $f(x) = -\frac{1}{3}(x - 3)^2$ **d)** $f(x) = 4(x + 2)^2 - 1$

5. Without graphing each function, identify the location of its vertex and axis of symmetry, direction of opening, maximum or minimum value, domain, range, and the number of x-intercepts.

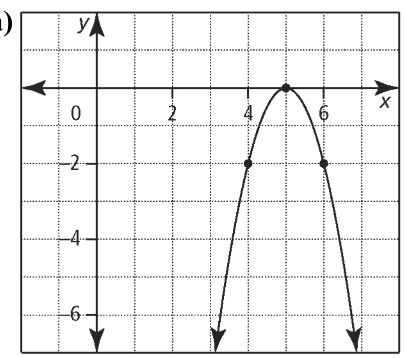
a) $y = 3(x - 5)^2 + 1$ **b)** $y = -\frac{1}{2}(x + 2)^2$
c) $y = (x + 4)^2 - 5$ **d)** $y = -5x^2 + 3$

6. Determine a quadratic function in vertex form that has the given characteristics.

a) its vertex at (2, 0) and passes through the point (1, 3)
b) its vertex at (–2, 3) and passes through the point (–1, 1)
c) its vertex at (3, –2) and has an x-intercept of (5, 0)
d) its vertex at (4, 1) and has a y-intercept of (0, –15)

7. Determine a quadratic function in vertex form for each parabola.

a)



b)