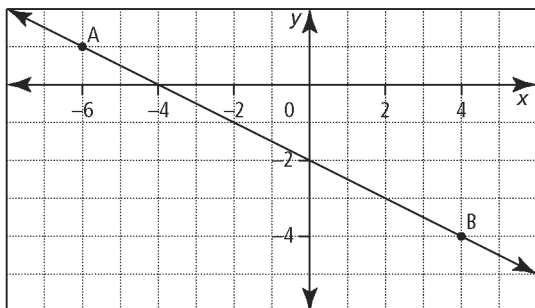# Chapter 3 Warm-Up

Section 3.1 Warm-Up

1. Consider the line passing through points A and B on the graph.

a) What is the slope of the line?

b) What is the x-intercept of the line?

c) Determine the equation of the line. Express your answer in the form $y = mx + b$.

d) What is the range of the linear function represented by the line?

e) What is the equation for a vertical line passing through point A?

2. If each equation is written in the form, $y = a(x - p)^2 + q$, what are the values of $a, p,$ and q?

a) $y = x^2 - 3$

b) $y = 9 - 4x^2$

c) $y = 2(x - 18)^2 - 6$

d) $y = -7(3 + x^2) + 2$

3. Create a table of values and use it to help you draw and label a graph for each function.

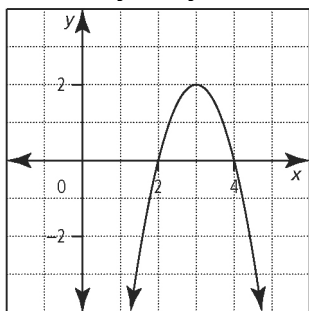**a)** $y = -\frac{2}{5}x + 2$ **b)** $3x - 2y - 1 = 0$

4. If $f(x) = -3x + 7$ and $g(x) = -2x^2 - 3x + 9$, what is the value of each of the following?

a) $f(0)$ **b)** $g(-1)$ **c)** $f\left(\frac{1}{3}\right)$

**5.** What is the degree of the polynomial $-2x^2 - 3x + 9$?

Section 3.2 Warm-Up

1. If the equation of the quadratic function shown on the graph is written in the form $y = a(x - p)^2 + q$, what is the value of p and q? What can you say with certainty about a?

2. a) Sketch the graph of the quadratic function $y = (x - 1)^2 - 9$. Then identify the following:

b) vertex   **c)** axis of symmetry

d) y-intercept   **e)** x-intercepts

f) range

3. Multiply using algebra tiles.

**a)** $(x + 1)(2x + 3)$ **b)** $(x - 2)^2$

4. For each graph, determine a quadratic function in vertex form.

a)

b)
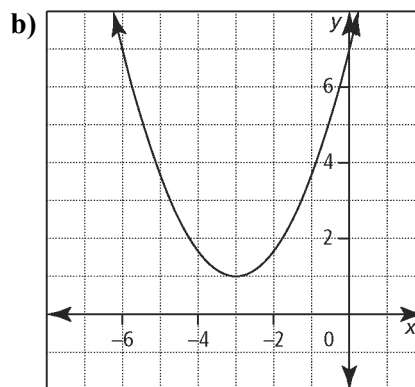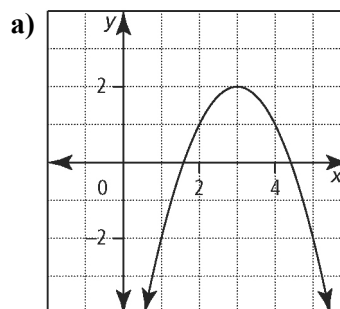
Section 3.3 Warm-Up

1. Write each equation of a quadratic function in standard form. Give the value for a, b, and c.

   a) $x = 3x^2 - y - 5$ **b)** $h(x) = (x - 2)^2 - 9$

   c) $y = -3(x - 1)^2 + 5$

2. Let $f(x) = 3x^2 + 12x - 4$ and $g(x) = -2(x - 5)^2 + 1$ represent quadratic functions. Use these functions to answer the following questions.

   a) How would you determine where function f crosses the vertical axis?

   b) Which function has a graph with a maximum value? What is the maximum value?

   c) What are the coordinates of the vertex of the graph of function g?

   d) What is the value of $f(-2)$?

   e) What is the equation of the axis of symmetry for function g?

3. Without graphing, explain how the graph of each function differs from the graph of $y = x^2$.

   a) $y = -3x^2$ **b)** $y = \dfrac{1}{4}x^2$

   c) $y = x^2 - 3$ **d)** $y = (x - 3)^2$

4. Without sketching a graph, determine the number of x-intercepts for each quadratic function. Explain how you know.

   a) $y = (x + 2)^2 + 1$ **b)** $y = 3x^2 - 3$

   c) $y = -2(x - 3)^2$

5. For each quadratic function, determine the number of x-intercepts and whether the y-intercept is positive, negative, or zero.

   a) a quadratic function with an axis of symmetry of $x = 4$ and a maximum value of 1

   b) a quadratic function with a range of $y \geq 0$

6. **a)** What product is shown by the algebra tile model? Shaded tiles are positive and white tiles are negative.
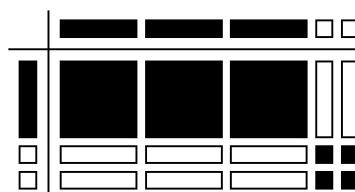
   b) Explain how to determine the simplified product using the algebra tiles.

   c) Check your answer to part b) using algebra.