11.

$$f(x) = -3x^2 + 3x - 4$$

domain: all real numbers,
range: $y \leq -\frac{13}{4}$

12.

$$y = \tfrac{1}{2}x^2 - 6x + 10$$

domain: all real numbers,
range: $y \geq -8$

14. neither

15. odd   **16.** neither

17.

$$h(x) = 2(x - 4)^2$$

The graph of h is a vertical stretch by a factor of 2 and a horizontal translation 4 units right of the graph of f.

18.

$$g(x) = \tfrac{1}{2}(x - 1)^2 + 1$$
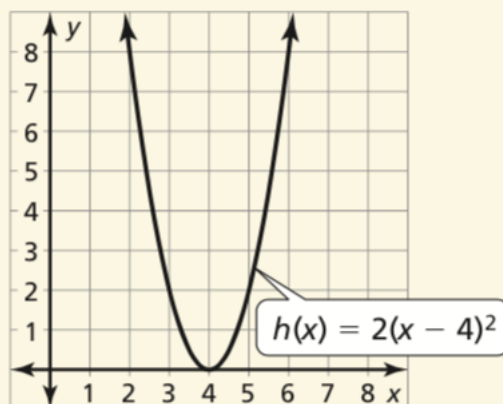
The graph of g is a vertical shrink by a factor of $\frac{1}{2}$, and a translation 1 unit right and 1 unit up of the graph of f.

19.

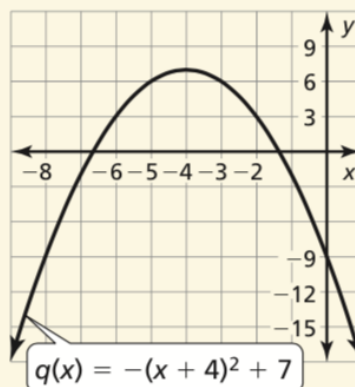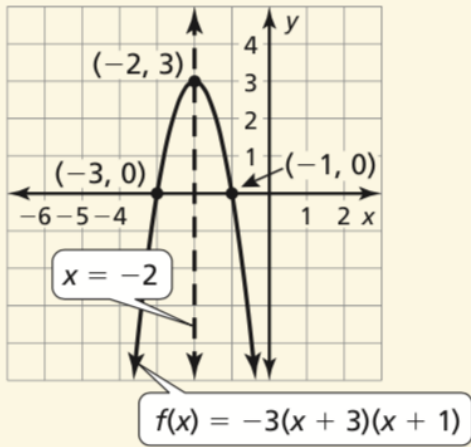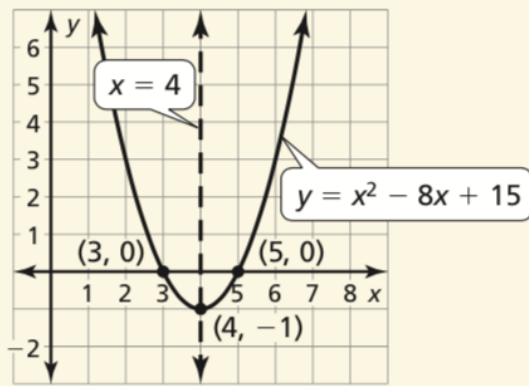$$q(x) = -(x + 4)^2 + 7$$

The graph of q is a reflection in the x-axis, and a translation 4 units left and 7 units up of the graph of f.

23.

(-2, 3)

(-3, 0)

(-1, 0)

x = -2

f(x) = -3(x + 3)(x + 1)

domain: all real numbers,
range: $y \leq 3$

24.

x = 4

y = x² - 8x + 15

(3, 0)

(5, 0)

(4, -1)

domain: all real numbers,
range: $y \geq -1$

25.

y = -2x² + 6x + 8 ✓

26.

f(x) = x² + x - 2

Pg 473 #1-7, 10-11

3.

$$p(x) = \tfrac{1}{2}(x + 1)^2 - 1$$

The graph of p is a vertical shrink by a factor of $\tfrac{1}{2}$, and a translation 1 unit left and 1 unit down of the graph of f.

4. a. domain: all real numbers, range: $y \le 8$; 3, 7

b. $f(x) = -2x^2 + 20x - 42$

c. The graph of f is a vertical stretch by a factor of 2, a reflection in the x-axis, and a translation 5 units right and 8 units up of the graph of g.
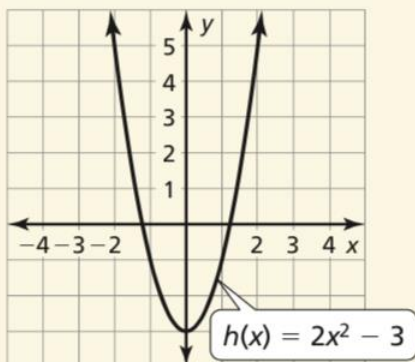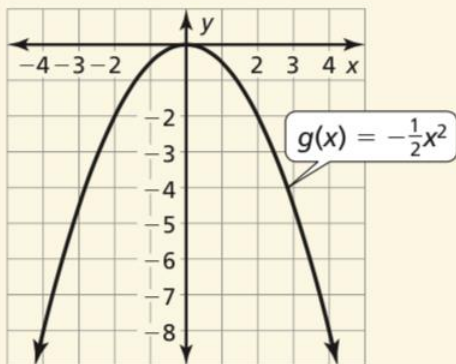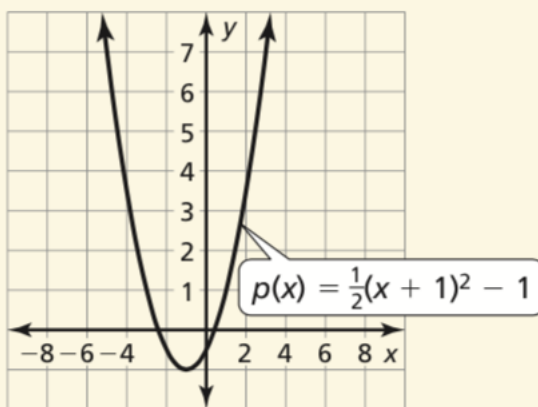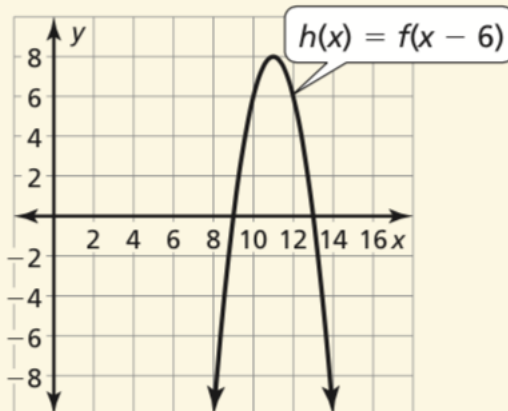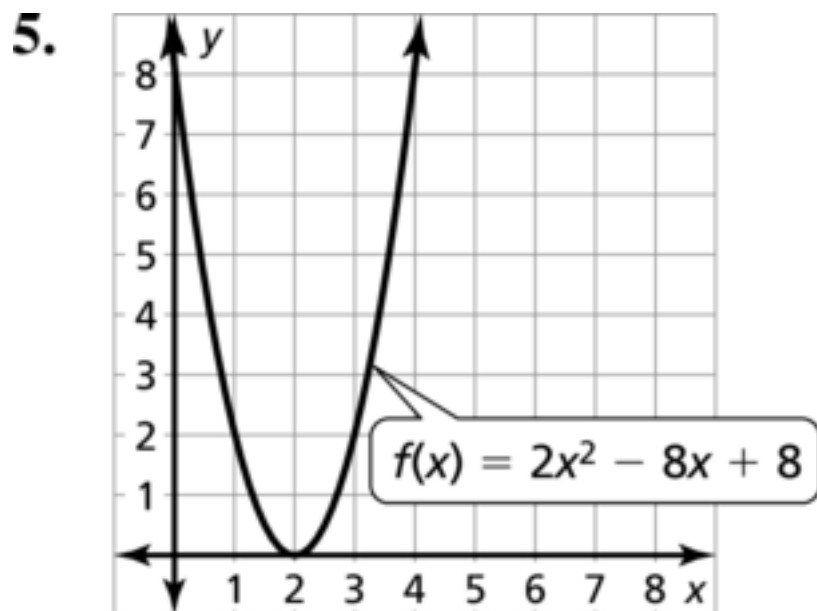
d.

$$h(x) = f(x - 6)$$

1.

$$h(x) = 2x^2 - 3$$
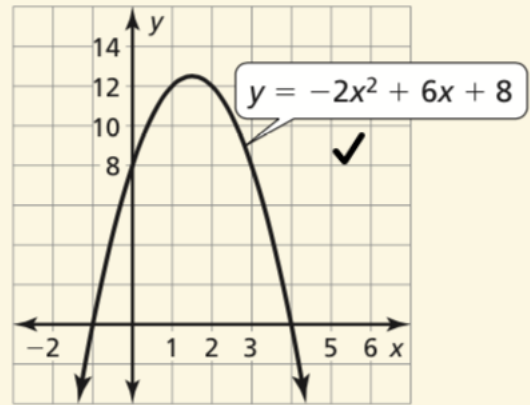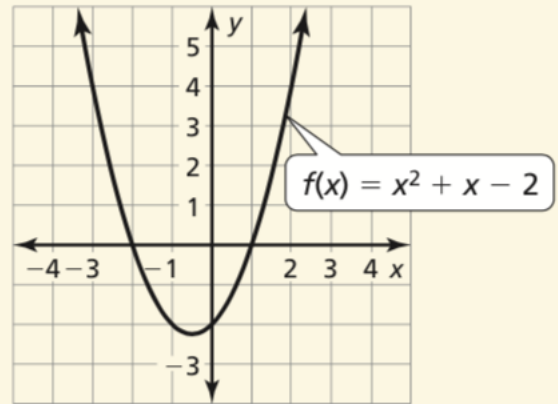
The graph of h is a vertical stretch by a factor of 2 and a vertical translation 3 units down of the graph of f.

2.

$$g(x) = -\tfrac{1}{2}x^2$$

The graph of g is a vertical shrink by a factor of $\tfrac{1}{2}$ and a reflection in the x-axis of the graph of f.

5.

$f(x) = 2x^2 - 8x + 8$

domain: all real numbers, range: $y \geq 0$

6.

$y = -(x + 5)(x - 1)$
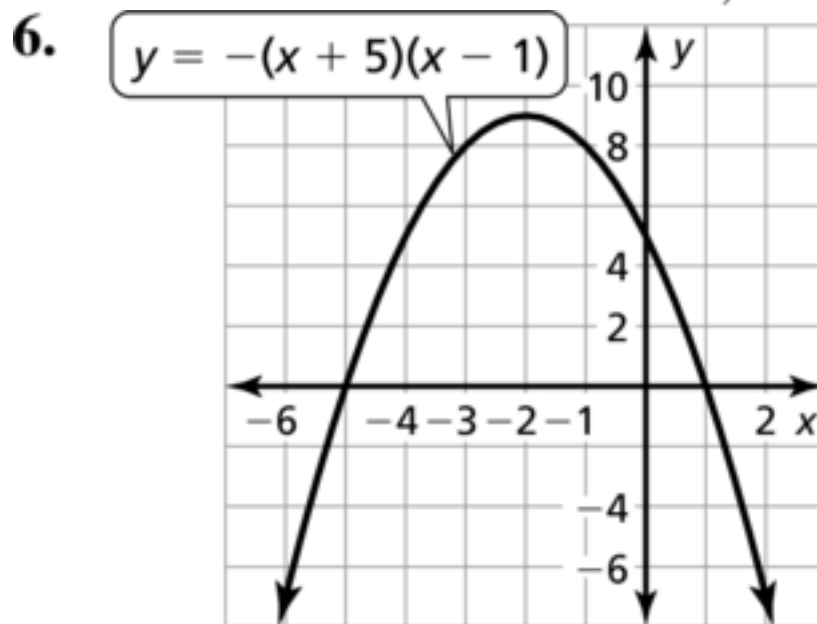
domain: all real numbers, range: $y \leq 9$

7.

$$h(x) = 16x^2 - 4$$
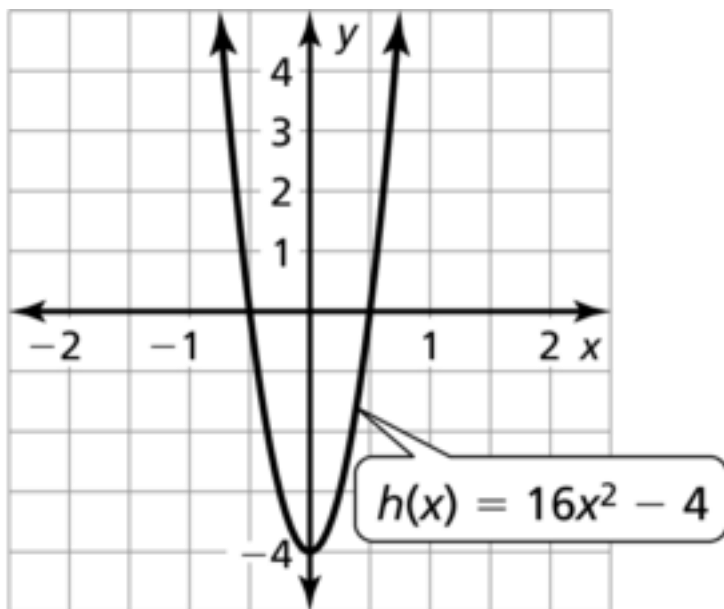
domain: all real numbers, range: $y \geq -4$

10. $f(x) = -\frac{1}{2}x^2 - 5x - 8$; *Sample answer:* Use the intercepts to write an equation in intercept form. Substitute the third point into the equation to find a. Write the equation in intercept form with the value of a. Simplify the equation to put it in standard form.

11. $f(x) = 3x^2 - 30x$; *Sample answer:* Use the intercepts to write an equation in intercept form. Substitute the third point into the equation to find a. Write the equation in intercept form with the value of a. Simplify the equation to put it in standard form.