



HAlg2\_HW  
2

2 Complete parts a-c for each quadratic function.

a. Find the  $y$ -intercept, the equation of the axis of symmetry, and the  $x$ -coordinate of the vertex.

b. Make a table of values that includes the vertex.

c. Use this information to graph the function.

12.  $f(x) = 4x^2$

14.  $f(x) = x^2 - 5$

16.  $f(x) = 4x^2 - 3$

18.  $f(x) = x^2 - 6x + 8$

20.  $f(x) = -x^2 + 4x - 6$

13.  $f(x) = -2x^2$

15.  $f(x) = x^2 + 3$

17.  $f(x) = -3x^2 + 5$

19.  $f(x) = x^2 - 3x - 10$

21.  $f(x) = -2x^2 + 3x + 9$

$y$ -intercept  $(0, 9)$   
 $x = \frac{-3}{2(-2)} = \frac{3}{4}$   
 $y = -2\left(\frac{3}{4}\right)^2 + 3\left(\frac{3}{4}\right) + 9 = -\frac{18}{16} + \frac{9}{4} + 9 = \frac{-18 + 36 + 144}{16} = \frac{81}{8}$   
Axis:  $x = \frac{3}{4}$

Determine whether each function has a *maximum* or *minimum* value, and find that value. Then state the domain and range of the function.

22.  $f(x) = 5x^2$

24.  $f(x) = x^2 - 6x + 9$

26.  $f(x) = 8x - 3x^2 + 2$

28.  $f(x) = 15 - 5x^2$

30.  $f(x) = -x^2 + 10x + 30$

23.  $f(x) = -x^2 - 12$

25.  $f(x) = -x^2 - 7x + 1$

27.  $f(x) = 5 - 4x - 2x^2$

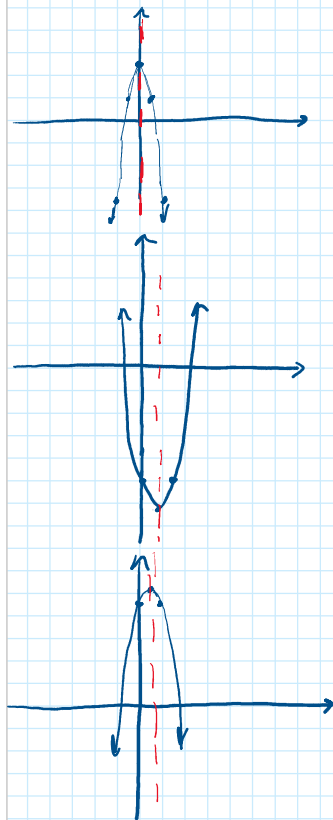
29.  $f(x) = x^2 + 12x + 27$

31.  $f(x) = 2x^2 - 16x - 42$

(23) maximum  
 $x = \frac{0}{2(-1)} = 0$   $(0, -12)$   
 $D: \{x \in \mathbb{R}\}$   $R: \{y \in \mathbb{R} \mid y \leq -12\}$

(24) minimum  
 $x = \frac{-(-6)}{2(1)} = 3$   $y = 3^2 - 6(3) + 9 = 9 - 18 + 9 = 0$   
 $(3, 0)$   
 $D: \{x \in \mathbb{R}\}$   $R: \{y \in \mathbb{R} \mid y \geq 0\}$

(31) minimum  
 $x = \frac{-(-16)}{2(2)} = 4$   $y = 2(4)^2 - 16(4) - 42 = 32 - 64 - 42 = -74$   
 $(4, -74)$   
 $D: \{x \in \mathbb{R}\}$   $R: \{y \in \mathbb{R} \mid y \leq -74\}$



**MP TOOLS** Use a calculator to find the maximum or minimum of each function. Round to the nearest hundredth if necessary.

43.  $f(x) = -9x^2 - 12x + 19$

44.  $f(x) = 12x^2 - 21x + 8$

45.  $f(x) = -8.3x^2 + 14x - 6$  (8.4, -0.96)

46.  $f(x) = 9.7x^2 - 13x - 9$

47.  $f(x) = 28x - 15 - 18x^2$

48.  $f(x) = -16 - 14x - 12x^2$

Determine whether each function has a *maximum* or *minimum* value, and find that value. Then state the domain and range of the function.

49.  $f(x) = -5x^2 + 4x - 8$

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

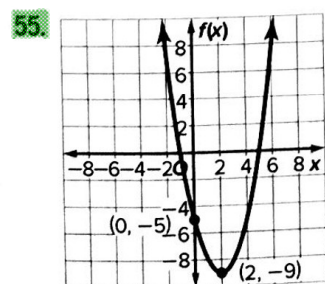
51.  $f(x) = -9 + 3x + 6x^2$

52.  $f(x) = 2x - 5 - 4x^2$

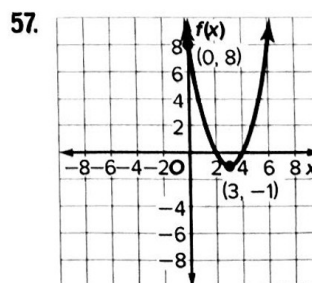
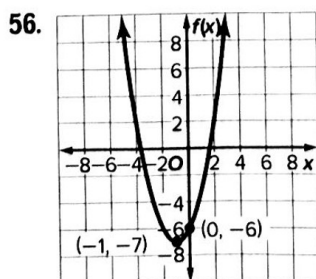
53.  $f(x) = \frac{2}{3}x^2 + 6x - 10$

54.  $f(x) = -\frac{3}{5}x^2 + 4x - 8$

Determine the function represented by each graph.



$y = (x-2)^2 - 9$



**Write each function in vertex form. Identify the vertex.**

**44.**  $y = x^2 + 10x + 17$

**45.**  $y = x^2 - 22x + 125$

**46.**  $y = 2x^2 - 4x + 5$

**47.**  $y = -8x^2 - 64x - 146$