

2 Complete parts a–c for each quadratic function.

- Find the y -intercept, the equation of the axis of symmetry, and the x -coordinate of the vertex.
- Make a table of values that includes the vertex.
- Use this information to graph the function.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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. $f(x) = -8.3x^2 + 14x - 6$

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

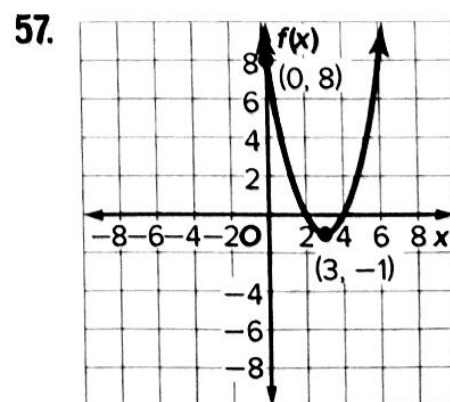
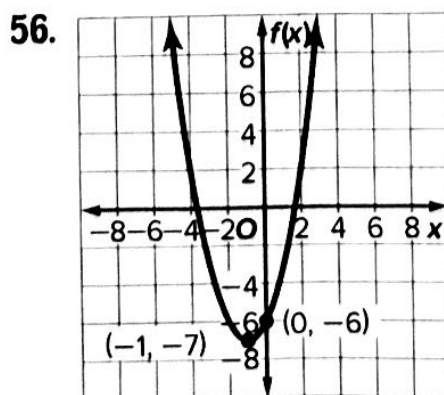
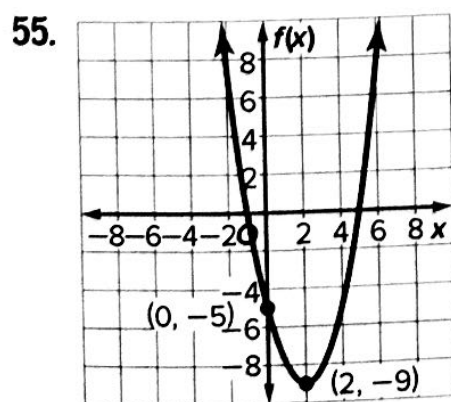
51. $f(x) = -9 + 3x + 6x^2$

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.



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