

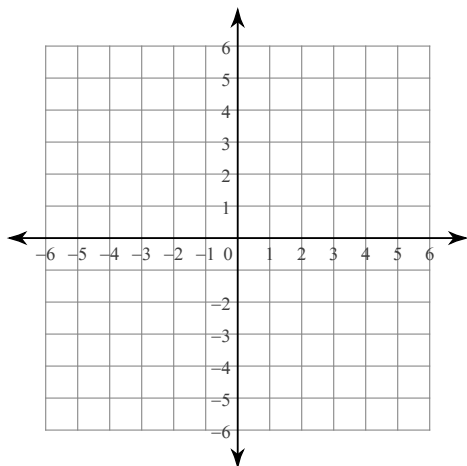
Evaluate each function.

33) $w(a) = a^2 - 3$; Find $w(-9)$

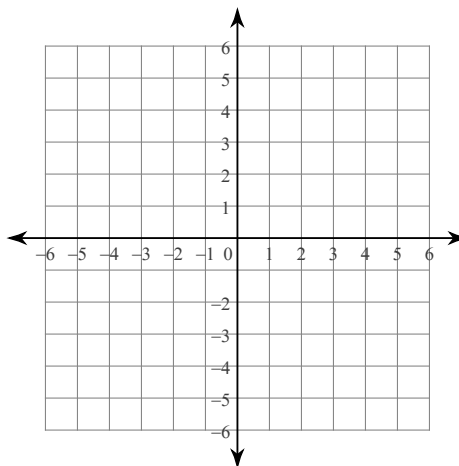
34) $w(x) = 2x - 2$; Find $w(2)$

Graph each equation.

35) $y = |x + 4| + 1$

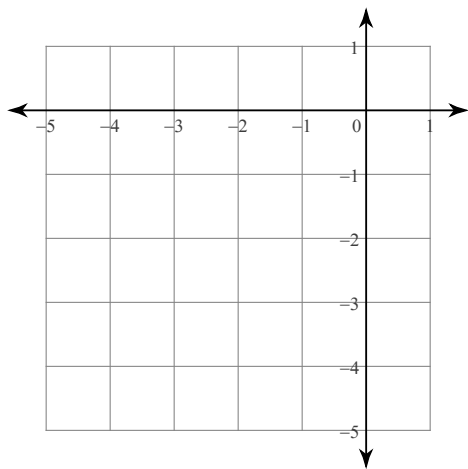


36) $y = -|x + 4| - 3$

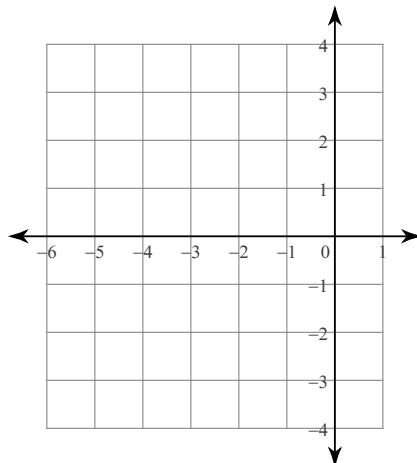


Identify the vertex of the graph and then graph the function.

37) $f(x) = (x + 1)^2 - 4$



38) $f(x) = -\frac{1}{2}(x + 4)^2 + 1$



Factor each completely.

39) $m^2 - 7m + 12$

40) $2x^3 + 2x^2 - 4x$

41) $x^2 + 4x - 5$

42) $2a^2 + 8a - 10$

Simplify.

43) $(8 + 8i) + (6i)$

44) $(2 + 8i) - 2$

45) $(-6 + 8i)(-5 + i)$

46) $(7 - 8i)^2$

Evaluate each function at the given value using the Remainder Theorem.

47) $f(n) = -2n^3 - 5n^2 + 14n + 7$ at $n = -4$

48) $f(a) = a^3 - 8a^2 + 14a + 7$ at $a = 5$

Find all zeros.

49) $y = x(2x + 5)(x - 4)$

50) $y = x(3x + 1)(x + 1)$

51) $y = x(2x + 1)(x - 4)$

52) $y = x(3x - 1)(x + 2)$

Describe the end behavior of each function.

53) $f(x) = x^4 - 3x^2 + 3x + 1$

54) $f(x) = -x^4 - x^3 + 3x^2 - 5$

55) $f(x) = x^3 - 3x^2$

56) $f(x) = -x^2 + 2x - 1$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

57) $-1, -3, -2$

58) $-5, 5, -2$

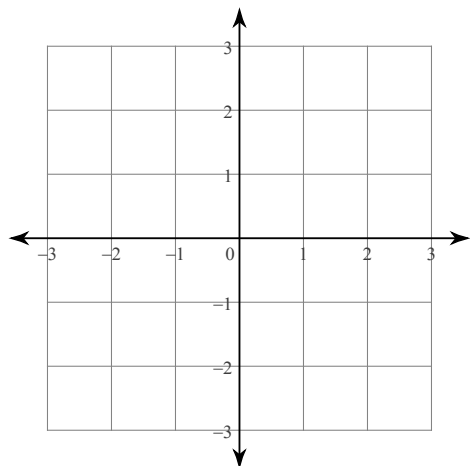
Factor each completely.

59) $-125a^3 - 27$

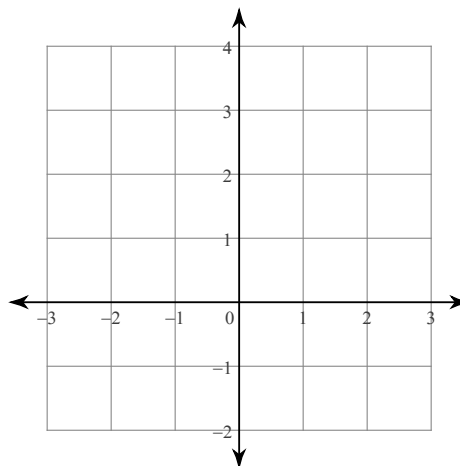
60) $1 + 216x^3$

Sketch the graph of each function.

61) $f(x) = x^2 + 2x - 1$



62) $f(x) = x^2 - 2x$



Find the discriminant of each quadratic equation then state the number and type of solutions.

63) $8x^2 - 4x - 4 = 0$

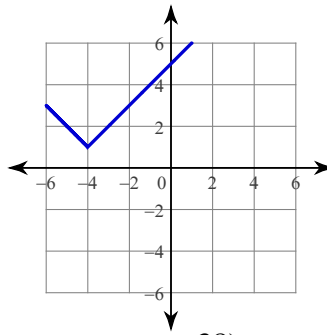
64) $4n^2 - 8n + 4 = 0$

Answers to

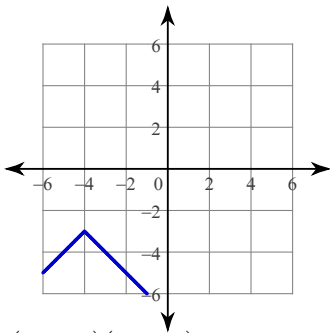
33) 78

34) 2

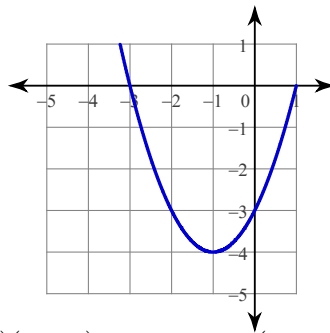
35)



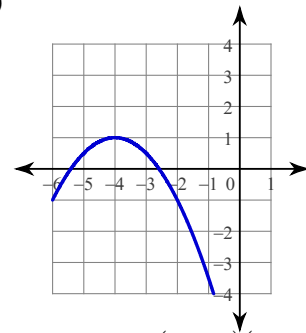
36)



37)



38)



39) $(m - 4)(m - 3)$

40) $2x(x + 2)(x - 1)$

41) $(x - 1)(x + 5)$

42) $2(a + 5)(a - 1)$

43) $8 + 14i$

44) $8i$

45) $22 - 46i$

46) $-15 - 112i$

47) -1

48) 2

49) $\left\{0, -\frac{5}{2}, 4\right\}$

50) $\left\{0, -\frac{1}{3}, -1\right\}$

51) $\left\{0, -\frac{1}{2}, 4\right\}$

52) $\left\{0, \frac{1}{3}, -2\right\}$

53) Rises to the left. Rises to the right

54) Falls to the left. Falls to the right

55) Falls to the left. Rises to the right

56) Falls to the left. Falls to the right

57) $f(x) = x^3 + 6x^2 + 11x + 6$

58) $f(x) = x^3 + 2x^2 - 25x - 50$

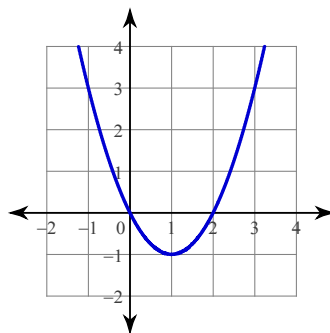
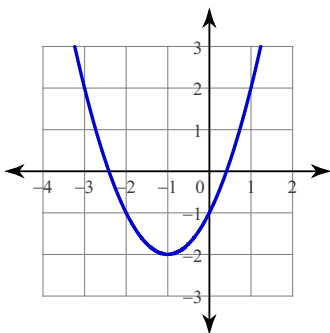
59) $(-5a - 3)(25a^2 - 15a + 9)$

60) $(1 + 6x)(1 - 6x + 36x^2)$

61)

62)

63) 144; two real solutions



64) 0; one real solution