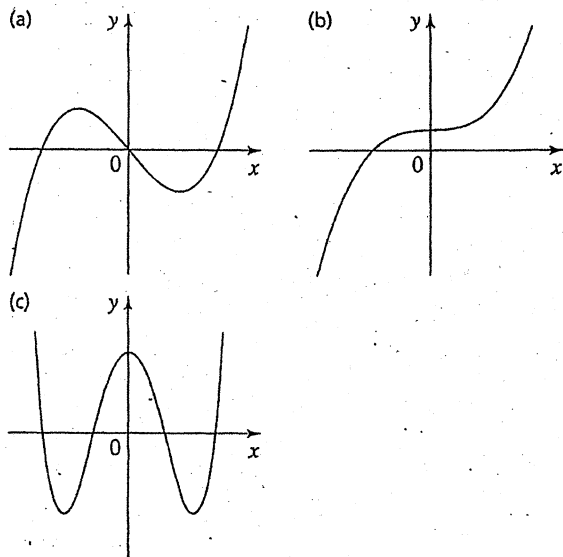


5. Determine whether f is even, odd, or neither.

(a) $f(x) = 2x^5 - 3x^2 + 2$ (b) $f(x) = x^3 - x^7$
 (c) $f(x) = \frac{1-x^2}{1+x^2}$ (d) $f(x) = \frac{1}{x+2}$

6. Determine whether the function in the figure is even, odd, or neither.



57. Express the quadratic function $f(x) = x^2 + 4x + 1$ in standard form.

58. Express the quadratic function $f(x) = -2x^2 + 12x + 12$ in standard form.

59. Find the minimum value of the function $g(x) = 2x^2 + 4x - 5$.

60. Find the maximum value of the function $f(x) = 1 - x - x^2$.

61. A stone is thrown upward from the top of a building. Its height (in feet) above the ground after t seconds is given by $h(t) = -16t^2 + 48t + 32$. What maximum height does it reach?

62. The profit P (in dollars) generated by selling x units of a certain commodity is given by

$$P(x) = -1500 + 12x - 0.0004x^2$$

What is the maximum profit, and how many units must be

66. If $f(x) = 1 + x^2$ and $g(x) = \sqrt{x-1}$, find the following functions.

(a) $f \circ g$ (b) $g \circ f$ (c) $(f \circ g)(2)$
 (d) $(f \circ f)(2)$ (e) $f \circ g \circ f$ (f) $g \circ f \circ g$

67–68 ■ Find the functions $f \circ g$, $g \circ f$, $f \circ f$, and $g \circ g$ and their domains.

67. $f(x) = 3x - 1$, $g(x) = 2x - x^2$

68. $f(x) = \sqrt{x}$, $g(x) = \frac{2}{x-4}$

69. Find $f \circ g \circ h$, where $f(x) = \sqrt{1-x}$, $g(x) = 1 - x^2$, and $h(x) = 1 + \sqrt{x}$.

70. If $T(x) = \frac{1}{\sqrt{1+\sqrt{x}}}$, find functions f , g , and h such that $f \circ g \circ h = T$.

71–76 ■ Determine whether the function is one-to-one.

71. $f(x) = 3 + x^3$ 72. $g(x) = 2 - 2x + x^2$

73. $h(x) = \frac{1}{x^4}$ 74. $r(x) = 2 + \sqrt{x+3}$

75. $p(x) = 3.3 + 1.6x - 2.5x^3$

76. $q(x) = 3.3 + 1.6x + 2.5x^3$

77–80 ■ Find the inverse of the function.

77. $f(x) = 3x - 2$ 78. $f(x) = \frac{2x+1}{3}$

79. $f(x) = (x+1)^3$ 80. $f(x) = 1 + \sqrt[3]{x-2}$

81. (a) Sketch the graph of the function

$$f(x) = x^2 - 4, \quad x \geq 0$$

(b) Use part (a) to sketch the graph of f^{-1} .

(c) Find an equation for f^{-1} .

82. (a) Show that the function $f(x) = 1 + \sqrt[3]{x}$ is one-to-one.

(b) Sketch the graph of f .

(c) Use part (b) to sketch the graph of f^{-1} .

(d) Find an equation for f^{-1} .

1–6 ■ Graph the polynomial. Show clearly all x - and y -intercepts.

1. $P(x) = (x-2)^3 + 8$

2. $P(x) = 32 - 2x^4$

3. $P(x) = x^3 - 9x$

4. $P(x) = x^3 - 5x^2 - 6x$

5. $P(x) = x^3 - 5x^2 - 4x + 20$

6. $P(x) = x^4 - 9x^2$

45–50 ■ Graph the rational function. Show clearly all x - and y -intercepts and asymptotes.

45. $r(x) = \frac{3x-12}{x+1}$

46. $r(x) = \frac{1}{(x+2)^2}$

47. $r(x) = \frac{x-2}{x^2-2x-8}$

48. $r(x) = \frac{2x^2-6x-7}{x-4}$

49. $r(x) = \frac{x^2-9}{2x^2+1}$

50. $r(x) = \frac{x^3+27}{x+4}$