

**49–52** ■ Graph the functions on the same screen using the given viewing rectangle. How is each graph related to the graph in part (a)?

49. Viewing rectangle  $[-8, 8]$  by  $[-2, 8]$   
 (a)  $y = \sqrt[4]{x}$  (b)  $y = \sqrt[4]{x+5}$   
 (c)  $y = 2\sqrt[4]{x+5}$  (d)  $y = 4 + 2\sqrt[4]{x+5}$

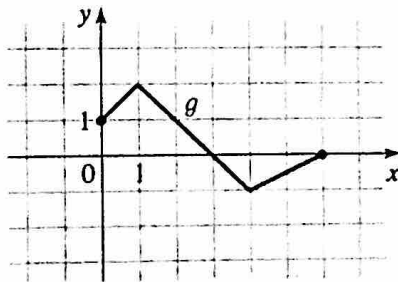
50. Viewing rectangle  $[-8, 8]$  by  $[-6, 6]$   
 (a)  $y = |x|$  (b)  $y = -|x|$   
 (c)  $y = -3|x|$  (d)  $y = -3|x-5|$

51. Viewing rectangle  $[-4, 6]$  by  $[-4, 4]$   
 (a)  $y = x^6$  (b)  $y = \frac{1}{3}x^6$   
 (c)  $y = -\frac{1}{3}x^6$  (d)  $y = -\frac{1}{3}(x-4)^6$

52. Viewing rectangle  $[-6, 6]$  by  $[-4, 4]$   
 (a)  $y = \frac{1}{\sqrt{x}}$  (b)  $y = \frac{1}{\sqrt{x+3}}$   
 (c)  $y = \frac{1}{2\sqrt{x+3}}$  (d)  $y = \frac{1}{2\sqrt{x+3}} - 3$

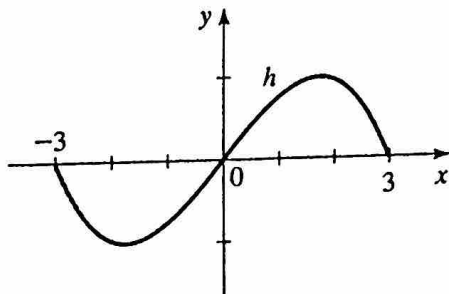
53. The graph of  $g$  is given. Use it to graph each of the following functions.

- (a)  $y = g(2x)$  (b)  $y = g(\frac{1}{2}x)$



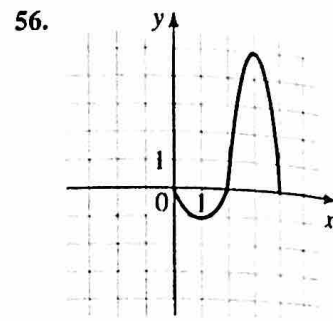
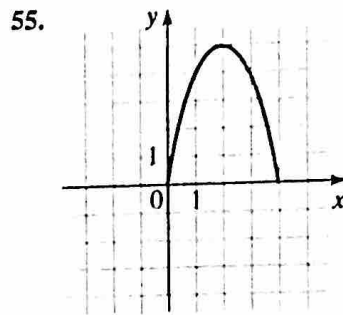
54. The graph of  $h$  is given. Use it to graph each of the following functions.

- (a)  $y = h(3x)$  (b)  $y = h(\frac{1}{3}x)$



**55–56** ■ The graph of a function defined for  $x \geq 0$  is given. Complete the graph for  $x < 0$  to make

- (a) an even function  
 (b) an odd function



**57–58** ■ Use the graph of  $f(x) = \llbracket x \rrbracket$  described on pages 162–163 to graph the indicated function.

57.  $y = \llbracket 2x \rrbracket$  (a)  $y = f(x)$  (b)  $y = f(2x)$  (c)  $y = f(\frac{1}{2}x)$

**59.** If  $f(x) = \sqrt{2x - x^2}$ , graph the following functions in the viewing rectangle  $[-5, 5]$  by  $[-4, 4]$ . How is each graph related to the graph in part (a)?

- (a)  $y = f(x)$  (b)  $y = f(2x)$  (c)  $y = f(\frac{1}{2}x)$

**60.** If  $f(x) = \sqrt{2x - x^2}$ , graph the following functions in the viewing rectangle  $[-5, 5]$  by  $[-4, 4]$ . How is each graph related to the graph in part (a)?

- (a)  $y = f(x)$  (b)  $y = f(-x)$  (c)  $y = -f(-x)$   
 (d)  $y = f(-2x)$  (e)  $y = f(-\frac{1}{2}x)$

**61–68** ■ Determine whether the function  $f$  is even, odd, or neither. If  $f$  is even or odd, use symmetry to sketch its graph.

61.  $f(x) = x^{-2}$  (a)  $y = f(x)$  (b)  $y = f(-x)$  (c)  $y = -f(-x)$   
 62.  $f(x) = x^{-3}$  (d)  $y = f(-2x)$  (e)  $y = f(-\frac{1}{2}x)$   
 63.  $f(x) = x^2 + x$  64.  $f(x) = x^4 - 4x^2$   
 65.  $f(x) = x^3 - x$  66.  $f(x) = 3x^3 + 2x^2 + 1$   
 67.  $f(x) = 1 - \sqrt[3]{x}$  68.  $f(x) = x + \frac{1}{x}$

69. The graphs of  $f(x) = x^2 - 4$  and  $g(x) = |x^2 - 4|$  are shown. Explain how the graph of  $g$  is obtained from the graph of  $f$ .

