55. $h(x) = \frac{1}{x} + 4$

56. $g(x) = \frac{1}{x - 2}$

57. $h(x) = -3x + 3$

58. $f(x) = 2x + 1$

59. $h(x) = \frac{1}{2}|x| - 2$

60. $g(x) = -|x| + 2$

61. $g(x) = -(x - 2)^3$

62. $f(x) = (x + 1)^3$

63. $g(x) = (x + 1)^2 - 1$

64. $h(x) = -x^2 - 4$

65. $g(x) = \frac{1}{3}x^3 + 2$

66. $h(x) = (-x)^3$

67. $f(x) = \sqrt{x + 2}$

68. $f(x) = -\frac{1}{2}\sqrt{x - 1}$

69. $f(x) = \sqrt[3]{x} - 2$

70. $h(x) = \sqrt[3]{x + 1}$

Describe how the graph of the function can be obtained from one of the basic graphs on p. 194.

71. $g(x) = |3x|$

72. $f(x) = \frac{1}{2}\sqrt[3]{x}$

73. $h(x) = \frac{2}{x}$

74. $f(x) = |x - 3| - 4$

75. $f(x) = 3\sqrt{x} - 5$

76. $f(x) = 5 - \frac{1}{x}$

77. $g(x) = |\frac{1}{3}x| - 4$

78. $f(x) = \frac{2}{3}x^3 - 4$

79. $f(x) = -\frac{1}{4}(x - 5)^2$

80. $f(x) = (-x)^3 - 5$

81. $f(x) = \frac{1}{x + 3} + 2$

82. $g(x) = \sqrt{-x} + 5$

83. $h(x) = -(x - 3)^2 + 5$

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

95. $g(x) = (x - 2)^2 + 3$ C. $2f(x)$

96. $g(x) = 2x^2 + 6$ D. $f(3x)$

Write an equation for a function that has a graph with the given characteristics.

97. The shape of $y = x^2$, but upside-down and shifted right 8 units

98. The shape of $y = \sqrt{x}$, but shifted left 6 units and down 5 units

99. The shape of $y = |x|$, but shifted left 7 units and up 2 units

100. The shape of $y = x^3$, but upside-down and shifted right 5 units

101. The shape of $y = 1/x$, but shrunk horizontally by a factor of 2 and shifted down 3 units

102. The shape of $y = x^2$, but shifted right 6 units and up 2 units

103. The shape of $y = x^2$, but upside-down and shifted right 3 units and up 4 units

104. The shape of $y = |x|$, but stretched horizontally by a factor of 2 and shifted down 5 units

105. The shape of $y = \sqrt{x}$, but reflected across the y-axis and shifted left 2 units and down 1 unit

106. The shape of $y = 1/x$, but reflected across the x-axis and shifted up 1 unit

#84 - describe how the graph of the function can be obtained from one of the basic attached basic graphs.

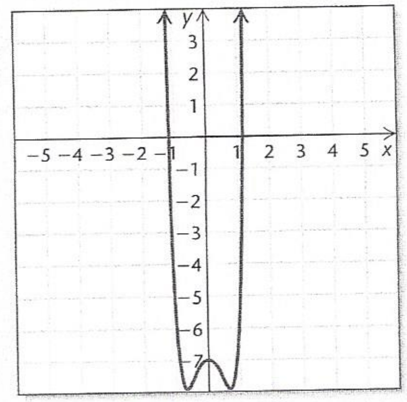
b) *Algebraic Solution*

$h(x) = 5x^6 - 3x^2 - 7$

1. $h(-x) = 5(-x)^6 - 3(-x)^2 - 7$
$= 5x^6 - 3x^2 - 7$

We see that $h(x) = h(-x)$. Thus the function is even.

Visualizing the Solution



$h(x) = 5x^6 - 3x^2 - 7$

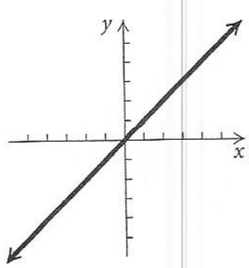
We see that the graph appears to be symmetric with respect to the y-axis. The function is even.

Now Try Exercises 39 and 41.

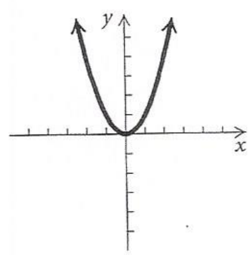
▶ Transformations of Functions

The graphs of some basic functions are shown below. Others can be seen on the inside back cover.

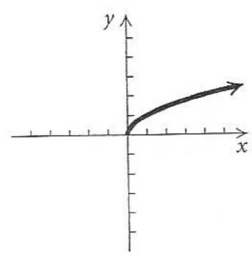
Identity function:
$y = x$



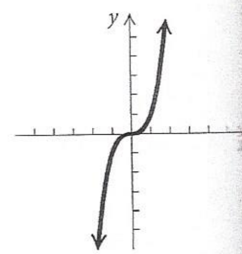
Squaring function:
$y = x^2$



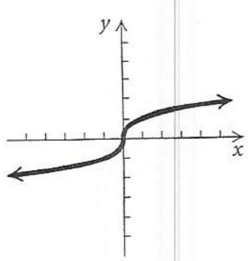
Square root function:
$y = \sqrt{x}$



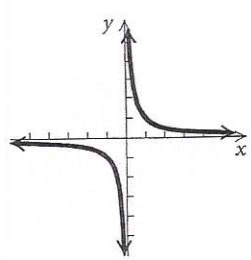
Cubing function:
$y = x^3$



Cube root function:
$y = \sqrt[3]{x}$



Reciprocal function:
$y = \frac{1}{x}$



Absolute-value function:
$y = |x|$