

values).

47. $p(x) = (x - 3)^2$

48. $Y_1 = \sqrt{x - 1}$

49. $h(x) = |x + 3|$

Sketch each graph using transformations of a parent function (without a table of values).

50. $f(x) = \sqrt[3]{x + 2}$

51. $g(x) = -|x|$

52. $Y_2 = -\sqrt{x}$

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

54. $g(x) = (-x)^3$

Use a table of values to graph the functions given on the same grid. Comment on what you observe.

55. $p(x) = x^2$, $q(x) = 2x^2$, $r(x) = \frac{1}{2}x^2$

56. $f(x) = \sqrt{-x}$, $g(x) = 4\sqrt{-x}$, $h(x) = \frac{1}{4}\sqrt{-x}$

57. $Y_1 = |x|$, $Y_2 = 3|x|$, $Y_3 = \frac{1}{3}|x|$

58. $u(x) = x^3$, $v(x) = 2x^3$, $w(x) = \frac{1}{5}x^3$

Sketch each graph using transformations of a parent function (without a table of values).

59. $f(x) = 4\sqrt[3]{x}$

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

61. $p(x) = \frac{1}{3}x^3$

62. $q(x) = \frac{3}{4}\sqrt{x}$

Use the characteristics of each function family to match a given function to its corresponding graph. The graphs are not scaled—make your selection based on a careful comparison.

63. $f(x) = \frac{1}{2}x^3$

64. $f(x) = \frac{-2}{3}x + 2$

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

66. $f(x) = -\sqrt[3]{x - 1} - 1$

67. $f(x) = |x + 4| + 1$

68. $f(x) = -\sqrt{x+6}$

69. $f(x) = -\sqrt{x+6} - 1$

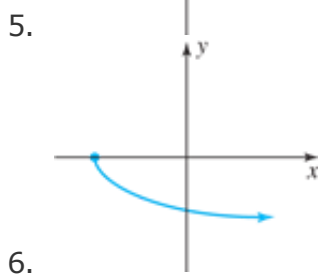
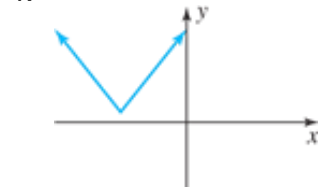
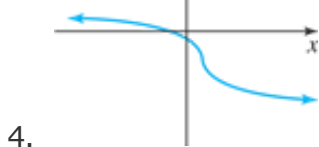
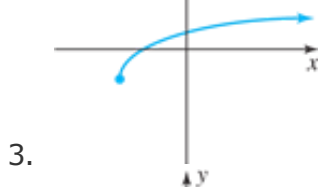
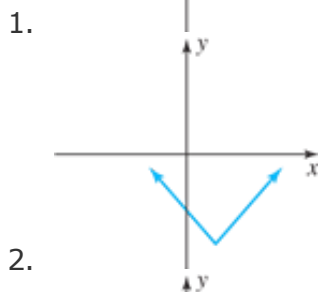
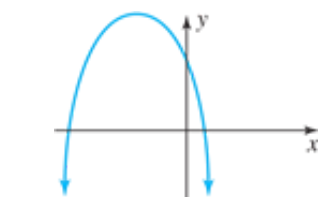
70. $f(x) = x + 1$

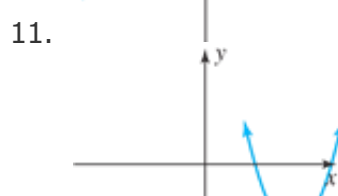
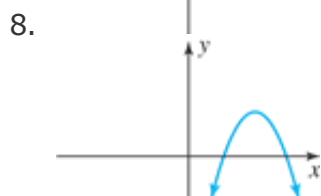
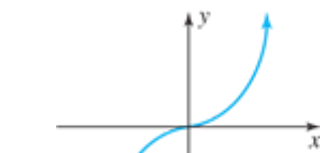
71. $f(x) = (x - 4)^2 - 3$

72. $f(x) = |x - 2| - 5$

73. $f(x) = \sqrt{x+3} - 1$

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





Graph each function using shifts of a parent function and a few characteristic points. Clearly state and indicate the transformations used and identify the location of all vertices, initial points, and/or inflection points.

75. $f(x) = \sqrt{x+2} - 1$

76. $g(x) = \sqrt{x-3} + 2$

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

78. $H(x) = -(x-2)^2 + 5$

79. $p(x) = (x+3)^3 - 1$

80. $q(x) = (x - 2)^3 + 1$

81. $Y_1 = \sqrt[3]{x + 1} - 2$

82. $Y_2 = \sqrt[3]{x - 3} + 1$

83. $f(x) = -|x + 3| - 2$

84. $g(x) = -|x - 4| - 2$

85. $h(x) = -2(x + 1)^2 - 3$

86. $H(x) = \frac{1}{2}|x + 2| - 3$

87. $p(x) = -\frac{1}{3}(x + 2)^3 - 1$

88. $q(x) = 5\sqrt[3]{x + 1} + 2$

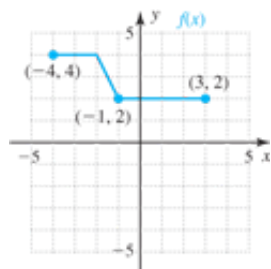
89. $Y_1 = -2\sqrt{-x - 1} + 3$

90. $Y_2 = 3\sqrt{-x + 2} - 1$

91. $h(x) = \frac{1}{5}(x - 3)^2 + 1$

92. $H(x) = -2|x - 3| + 4$

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Apply the transformations indicated for the graph of the general functions given.

93.

1. $f(x - 2)$
2. $-f(x) - 3$
3. $\frac{1}{2}f(x + 1)$
4. $f(-x) + 1$

Perform transformations on a general function $f(x)$