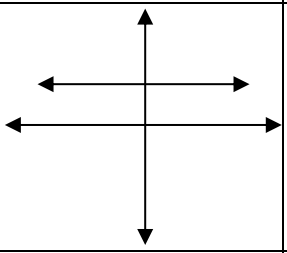
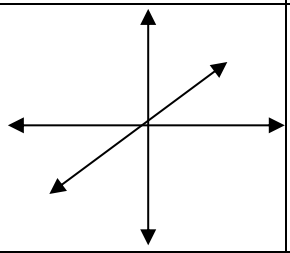
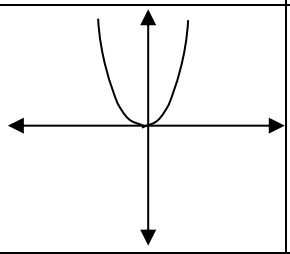
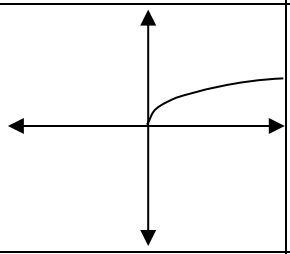
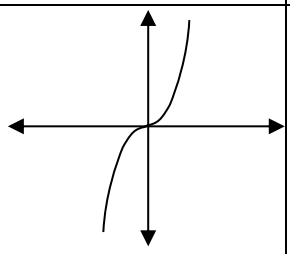
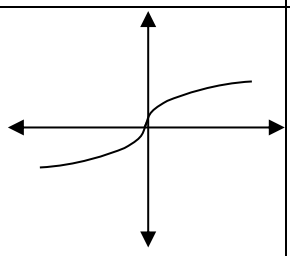
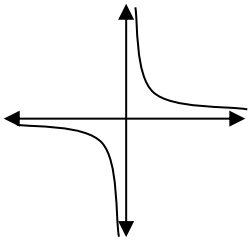
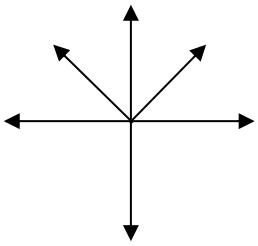
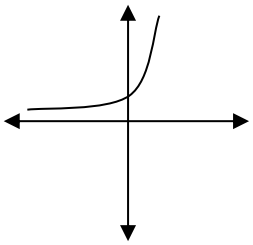
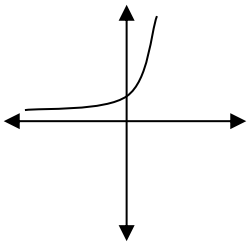
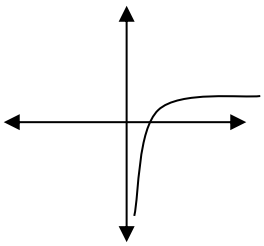
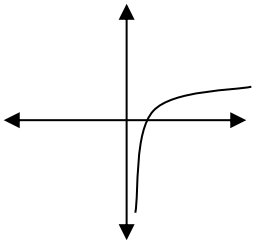
Chapter 1 Library of Functions

Parent Function/ Reference Points	Graph	Name/Type	General Equation	Domain/Range
$f(x) = c$		Constant	$f(x) = c$	D: $(-\infty, \infty)$ R: c
$f(x) = x$ (0, 0) (1, 1) (-1, -1)		Linear	$f(x) = Ax + B$	D: $(-\infty, \infty)$ R: $(-\infty, \infty)$
$f(x) = x^2$ (0, 0) (1, 1) (-1, 1)		Quadratic	$f(x) = Ax^2 + Bx + C$ Vertex form: $f(x) = a(x-h)^2 + k$	D: $(-\infty, \infty)$ R: $[0, \infty)$
$f(x) = \sqrt{x}$ (0, 0) (1, 1) (4, 2)		Square Root	$f(x) = A\sqrt{Bx + C} + D$	D: $[0, \infty)$ R: $[0, \infty)$
$f(x) = x^3$ (0, 0) (1, 1) (-1, -1)		Cubic	$f(x) = Ax^3 + Bx^2 + Cx + D$ Other form; $f(x) = a(x-h)^3 + k$	D: $(-\infty, \infty)$ R: $(-\infty, \infty)$
$f(x) = \sqrt[3]{x}$ (0, 0) (1, 1) (-1, -1)		Cube Root	$f(x) = A\sqrt[3]{Bx + C} + D$	D: $(-\infty, \infty)$ R: $(-\infty, \infty)$

Parent Function/ Reference Points	Graph	Name/Type	General Equation	Domain/Range
$f(x) = \frac{1}{x}$ (0, 0) (1, 1) (-1, -1)		Reciprocal	$f(x) = A\frac{1}{(Bx + C)} + D$	D: $(-\infty, 0)(0, \infty)$ R: $(-\infty, 0)(0, \infty)$
$f(x) = \lvert x \rvert$ (0, 0) (1, 1) (-1, 1)		Absolute Value	$f(x) = A\lvert Bx + C \rvert + D$	D: $(-\infty, \infty)$ R: $[0, \infty)$
$f(x) = a^x$ (0, 1) (1, a)		Exponential Base a	$f(x) = Aa^{Bx+C} + D$	D: $(-\infty, \infty)$ R: $(0, \infty)$
$f(x) = e^x$ (0, 1) (1, *e*)		Exponential Base *e* $e \approx 2.7$	$f(x) = Ae^{Bx+C} + D$	D: $(-\infty, \infty)$ R: $(0, \infty)$
$f(x) = \log_a x$ (1, 0) (a, 1)		Logarithmic Base *a* (Common Log is base 10)	$f(x) = A\log_a(B\,x + C) + D$	D: $(0, \infty)$ R: $(-\infty, \infty)$
$f(x) = \ln x$ (1, 0) (*e*, 1)		Natural Log Base *e* $e \approx 2.7$	$f(x) = \mathrm{A}\ln(\mathrm{B}\,x + C) + D$	D: $(0, \infty)$ R: $(-\infty, \infty)$