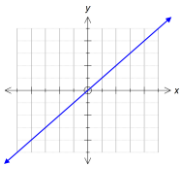
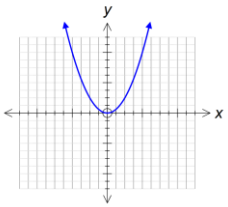
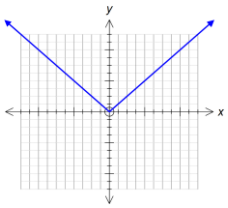
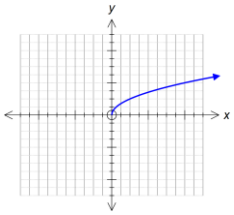
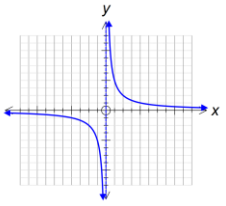
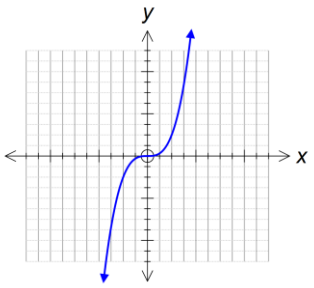
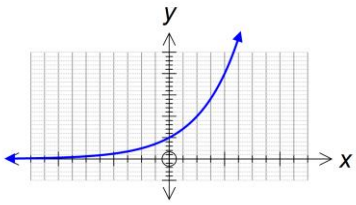
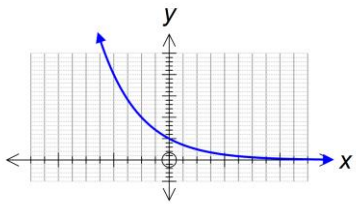
Function Name	Basic Equation	Transformed Equation	Basic Sketch	Domain	Range
Linear	$y = x$	$y = ax + c$ Usually written as: $y = mx + b$ Where m is the slope and b the y-intercept		$\{x \in R\}$	$\{y \in R\}$ Unless m = 0 then: $\{y = b\}$
Quadratic	$y = x^2$	$y = a(x-d)^2 + c$ Usually written as: $y = a(x-h)^2 + k$ or $y = a(x-p)^2 + q$ Where the vertex is (h, k) or (p, q)	 The key points are: (-2, 4), (-1, 1), (0, 0), (1, 1), (2, 4)	$\{x \in R\}$	If $a > 0$ $\{y \in R \mid y \geq k\}$ or $\{y \in R \mid y \geq q\}$ If $a < 0$ $\{y \in R \mid y \leq k\}$ or $\{y \in R \mid y \leq q\}$
Absolute Value	$y = \lvert x \rvert$	$y = a\lvert k(x-d)\rvert + c$	 The key points are: (-2, 2), (-1, 1), (0, 0), (1, 1), (2, 2)	$\{x \in R\}$	If $a > 0$ $\{y \in R \mid y \geq c\}$ If $a < 0$ $\{y \in R \mid y \leq c\}$
Square Root	$y = \sqrt{x}$	$y = a\sqrt{k(x-d)} + c$	 The key points are: (0, 0), (1, 1), (4,2), (9, 3)	If $k > 0$ $\{x \in R \mid x \geq d\}$ If $k < 0$ $\{x \in R \mid x \leq d\}$	If $a > 0$ $\{y \in R \mid y \geq c\}$ If $a < 0$ $\{y \in R \mid y \leq c\}$
Reciprocal	$y = \frac{1}{x}$	$y = \frac{a}{k(x-d)} + c$ Usually written as: $y = \frac{a}{x-d} + c$	 The key points are: (-2, -½), (-1,-1), (-½, -2) (2, ½), (1,1), (½,2)	$\{x \in R \mid x \neq d\}$ Vertical Asymptote is: $x = d$	$\{y \in R \mid y \neq c\}$ Horizontal Asymptote is: $y = c$

Function Name	Basic Equation	Transformed Equation	Basic Sketch	Domain	Range
Cubic	$y = x^3$	$y = a(k(x-d))^3 + c$ Usually written as: $y = a(x-d)^3 + c$	 The key points are: (-2, -8), (-1, -1), (0, 0), (1, 1), (2, 8)	$\{x \in R\}$	$\{y \in R\}$
Exponential	$y = b^x$ $b > 0$	$y = ab^{k(x-d)} + c$ $b > 0$	 $b > 1$: The key points are: (-1, 1/b), (0, 1), (1, b), (2, b^2)  $b < 1$: The key points are: (-2, b^2),(-1, b), (0, 1), (1, 1/b)	$\{x \in R\}$	If $a > 0$ $\{y \in R \mid y > c\}$ If $a < 0$ $\{y \in R \mid y < c\}$ Horizontal Asymptote is: $y = c$
General	$y = f(x)$	$y = af(k(x-d)) + c$	$(x, y) \rightarrow \left(\frac{x}{k} + d, ay + c\right)$ a: Vertical reflection if $a < 0$ Vertical stretch if $\lvert a\rvert > 1$ Vertical compression if $\lvert a\rvert < 1$ Multiply all "y" values by "a" k: Horizontal reflection if $k < 0$ Horizontal stretch if $\lvert k\rvert < 1$ Horizontal compression if $\lvert k\rvert > 1$ Divide all "x" values by "k" d: Horizontal translation "d" units to the -right if $d > 0$ $(x-d)$ -left if $d < 0$ $(x+d)$ c: Vertical translation "c" units -up if $c > 0$ -down if $c < 0$		