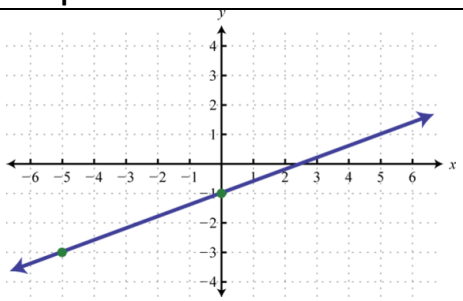
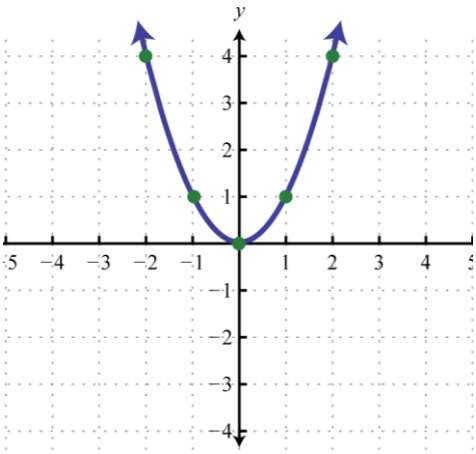
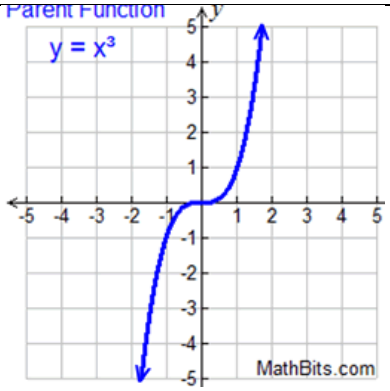
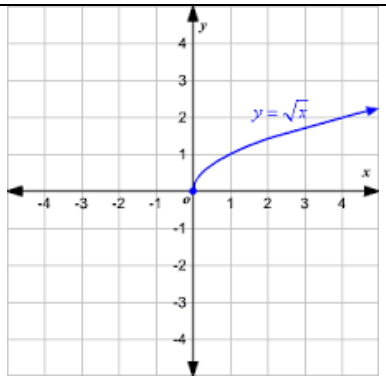
Function	Properties	Graph
Linear function	$f(x) = ax + b$ Domain : { R } Range : { R } Continuous	
Quadratic function	$f(x) = ax^2 + bx + c$, $a \neq 0$ $f(x) = a(x - h)^2 + k$ [Graph] **vertex** : [h , k] $h = \frac{-b}{2a}$, $k = f(h)$ **parabola** : if opens up = $a > 0$, positive if opens down = $a < 0$, negative **Axis of parabola** : $x = h$ **Domain** :{ R } **Range** : if opens up = [k , ∞) If opens down = (-∞ , k] **Interval for increasing** : If opens up = [h , ∞) If opens down = (-∞ , h] **Interval for decreasing** : If opens up = (-∞ , h] If opens down = [h , ∞) **Narrower** = $\lvert a \rvert > 1$ **Wider** = $0 < \lvert a \rvert < 1$ **x-intercept** : put y = 0 **y-intercept** : put x = 0 **How many x-intercept of f (x)** : - $b^2-4ac > 0$ = 2 intercept - $b^2-4ac = 0$ = 1 intercept - $b^2-4ac < 0$ = No x-intercept	

Cubic Function	f (x) = $ax^3 + bx^2 + cx + d$ Domain :{ R } Range { R } Continuous	
Quadratic root function	f (x) = $\sqrt{x}$ Domain : [0 , ∞) Range : [0 , ∞)