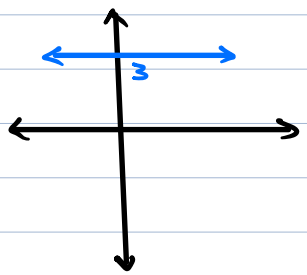
Graph:

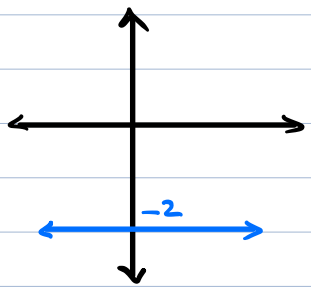
* Constant Function:

$f(x) = k$, k Const

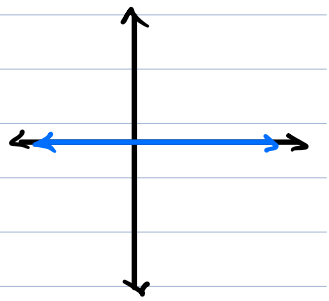
$f(x) = 3$



$f(x) = -2$

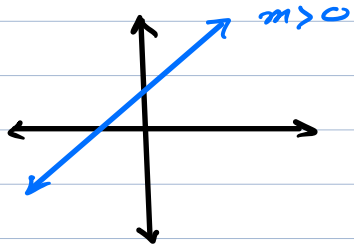


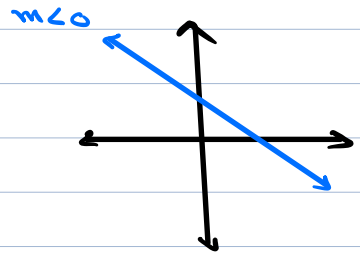
$f(x) = 0$



* Linear Function:

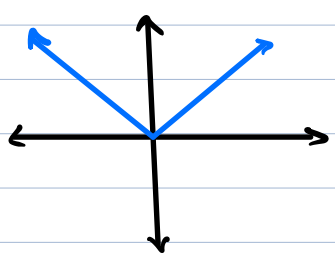
$f(x) = mx + b$



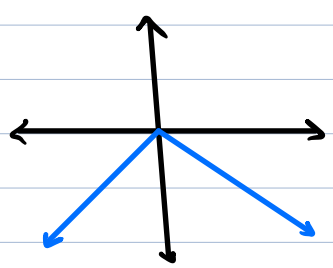


* Absolute Function:

$f(x) = |x|$



$f(x) = -|x|$



Vertex Form:

$f(x) = |x - h| + k$

vertex $= (h, k)$

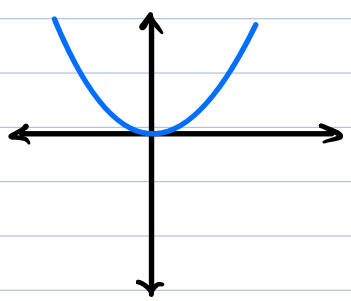
$f(x) = |x - 3| + 2$

vertex $= (3, 2)$

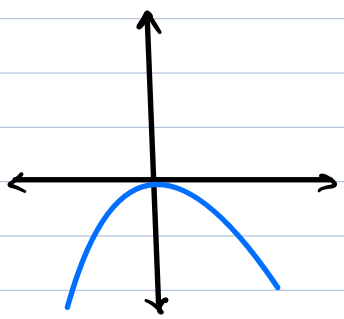
---

* Quadratic Function:

$f(x) = x^2$



$f(x) = -x^2$



vertex form:

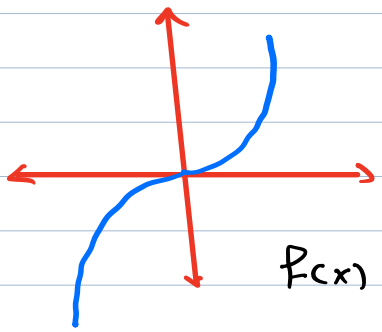
$f(x) = (x - h)^2 + k$

vertex $= (h, k)$

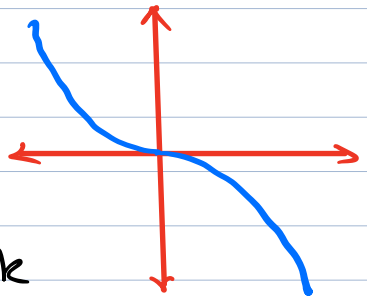
---

* Cubic Function:

$f(x) = x^3$



$f(x) = -x^3$



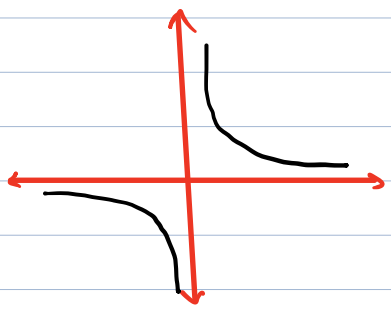
$f(x) = (x-h)^3 + k$

(h, k)

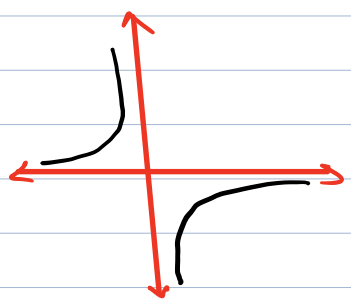
---

* Rational Function:

$f(x) = \frac{1}{x}$



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

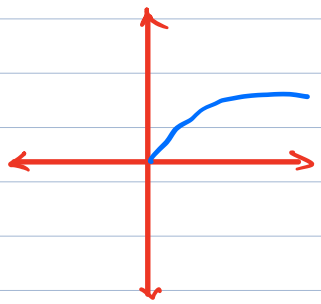


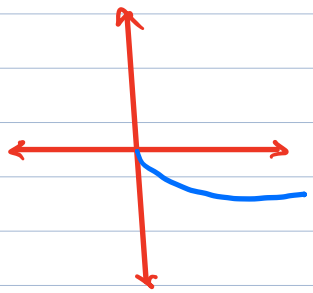
$f(x) = \frac{1}{x-h} + k$

Point of symmetry (h, k)

Radical Function:

$f(x) = \sqrt{x}$, $f(x) = -\sqrt{x}$





$f(x) = \sqrt{x-h} + k$

(h, k)

Exponential Function

$f(x) = a(b)^x$

initial ↵ ↳ $b > 1$ ↵

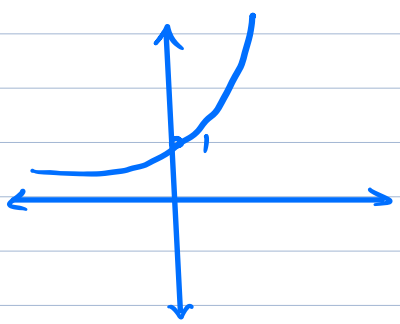
↳ $x > 0$

$f(x) = a(b)^x$

initial ↵ ↳ $0 < b < 1$

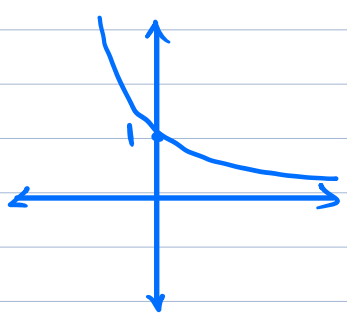
↳ $x < 0$

→ Growth



$f(x) = 2^x$

→ Decay.



$f(x) = \left(\frac{1}{2}\right)^x$

$f(x) = (2)^{-x}$

$f(x) = \left(\frac{1}{2}\right)^{-x} = 2^x$

Growth.

Reflection:

(x, y) — x-axis → $(x, -y)$

y-axis → $(-x, y)$

origin → $(-x, -y)$

$(2, -3)$ — x-axis → $(2, 3)$

y-axis → $(-2, -3)$

origin. → $(-2, 3)$

Translation:

$f(x) \longrightarrow f(x-h) + k$

h units x-axis → right / left

k units y-axis → up / Down.

$f(x) \longrightarrow f(x-2)+3$

2 units right

3 units up