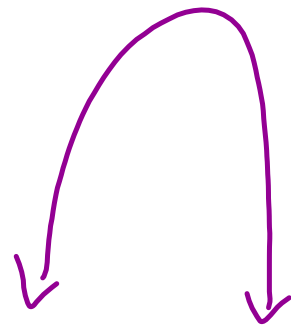


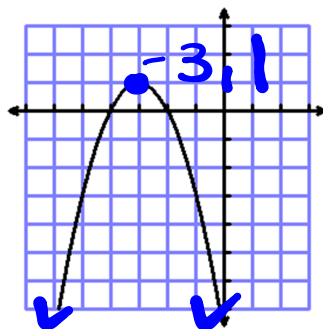
Characteristics  
of  
Quadratics



Domain: All x-values of a function; input  
All real #;  $\mathbb{R}$ ;  $(-\infty, \infty)$

Range: All y-values of a function; output

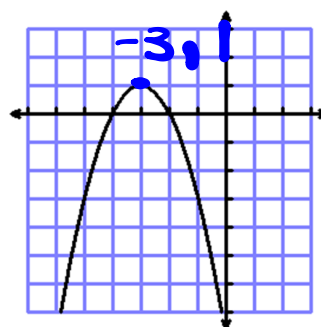
$$y \leq 1 \quad \text{OR} \quad (-\infty, 1]$$



## VERTEX

The highest or lowest point on the graph of a parabola

A point  
 $(-3, 1)$

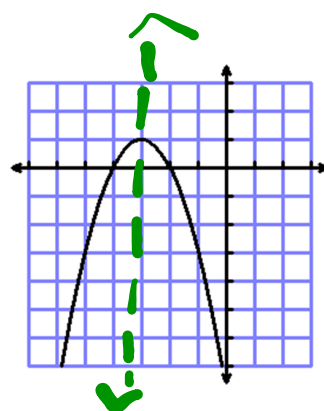


Axis of Symmetry:

The vertical line through the vertex of the parabola

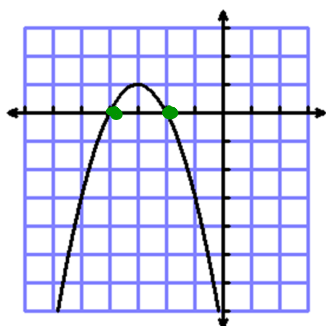
$x = \#$   $x$ -part  
of  
the  
vertex

$x = -3$



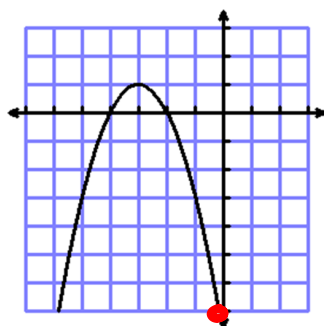
x-intercept/Zeros: the point at which the line intersects the x-axis; zeros

$(\#, 0)$



$(2, 0)$  &  $(-4, 0)$

y-intercept: The point at which the line intersects the y-axis



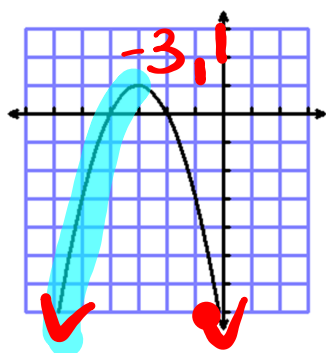
$(0, \#)$  .

$(0, -7)$

Interval of increase: Sweeps from left to right and goes up.

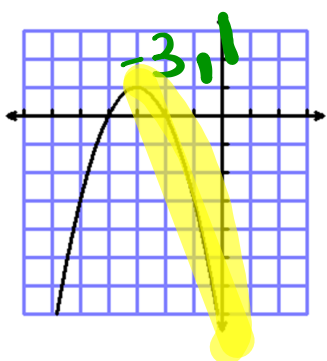
only use x values

$-\infty$  = left  
 $+\infty$  = right



$(-\infty, -3)$

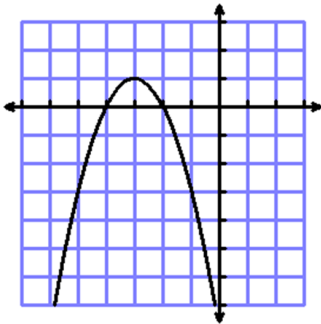
Interval of decrease: sweeps left to right and goes down  
 $x$ -values



$(-3, \infty)$

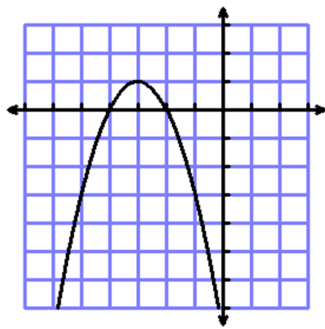


Extrema: Maximum or Minimum



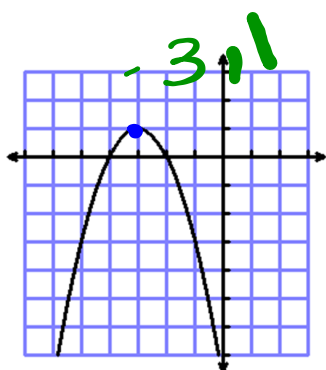
one or  
the other;  
vertex

Minimum: the lowest point; valley



none  
↑ ↑

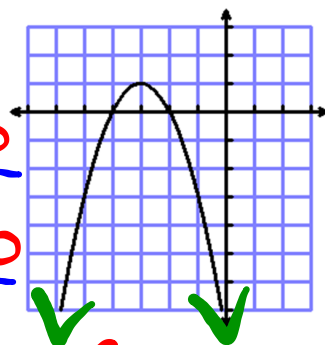
Maximum: Highest Point; hilltop



End Behavior: the behavior of the graph as it approaches  $+\infty$  +  $-\infty$

As  $x \rightarrow +\infty$ ,  $f(x) \rightarrow -\infty$

$x \rightarrow -\infty$ ,  $f(x) \rightarrow -\infty$



Quadratics - Does the same thing

Linear: Opposite

