Non- Linear Relationships and Functions

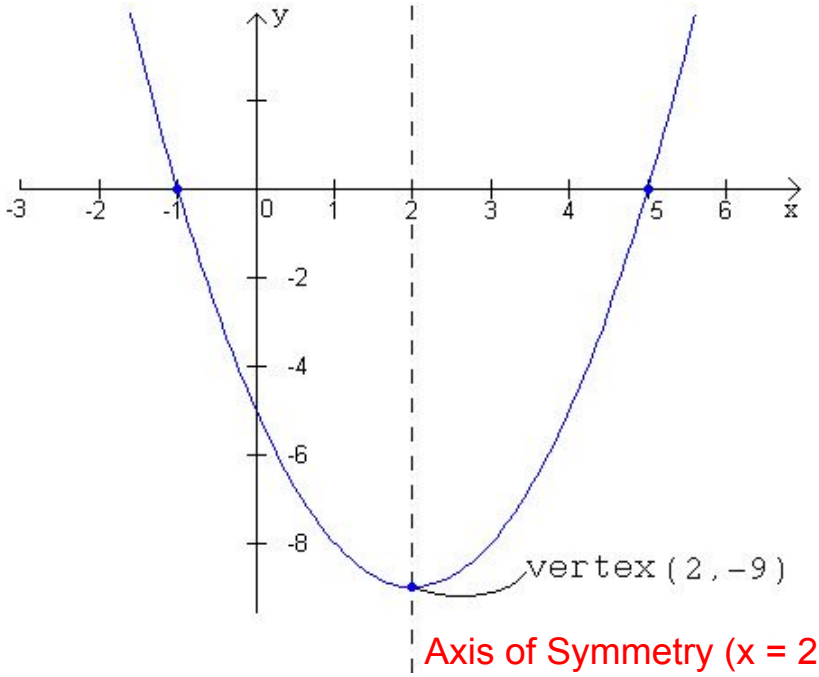
Quadratic Functions and Their Graphs

Parabola = the curved graph of a quadratic equation

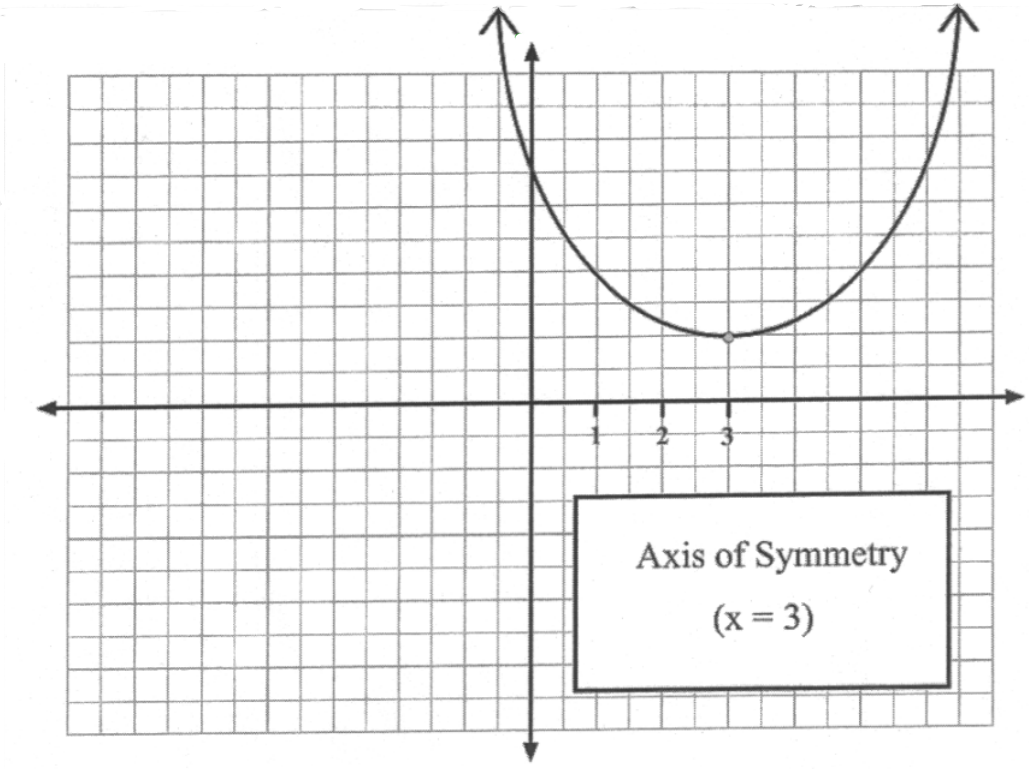
Axis of Symmetry = a line in which a parabola or other graph is reflected onto itself.

Vertex of a Parabola = the point on a parabola where a minimum or maximum y-value occurs.

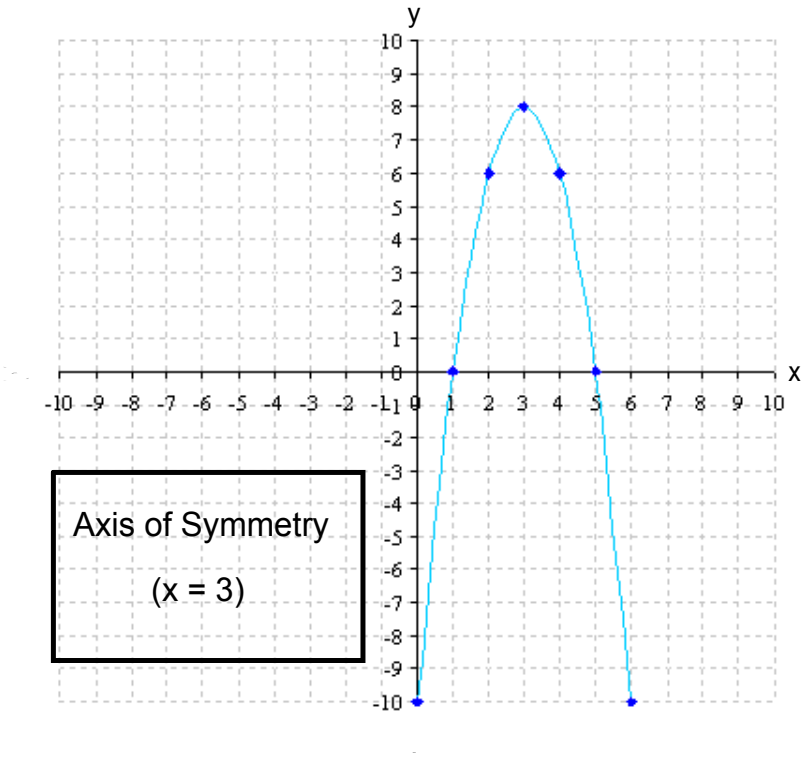
Example: 1



Example: 2

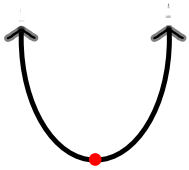


Example: 3

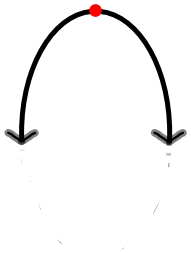


Minimum and Maximum Values

Minimum Value - The co-ordinate of the vertex when a parabola opens upward.



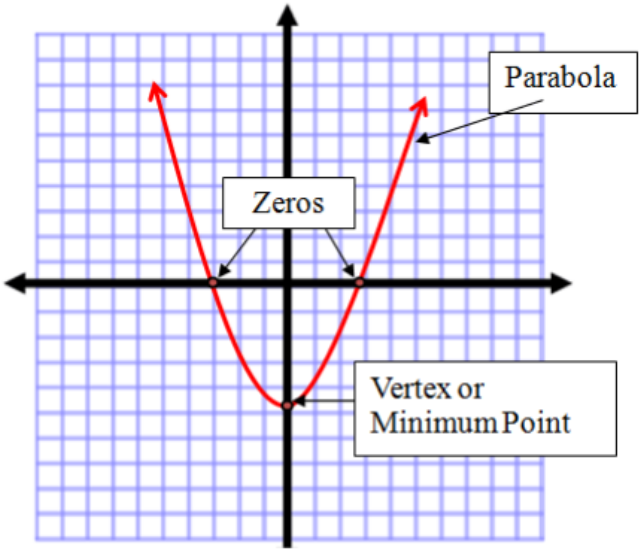
Maximum Value - The co-ordinate of the vertex when a parabola opens downward.



Zeros of a Function(when y=0)

The values of x which make the quadratic function equal to zero (y = 0)

To find the zeros of a function, look for the x-intercepts .
For Example:



Example:

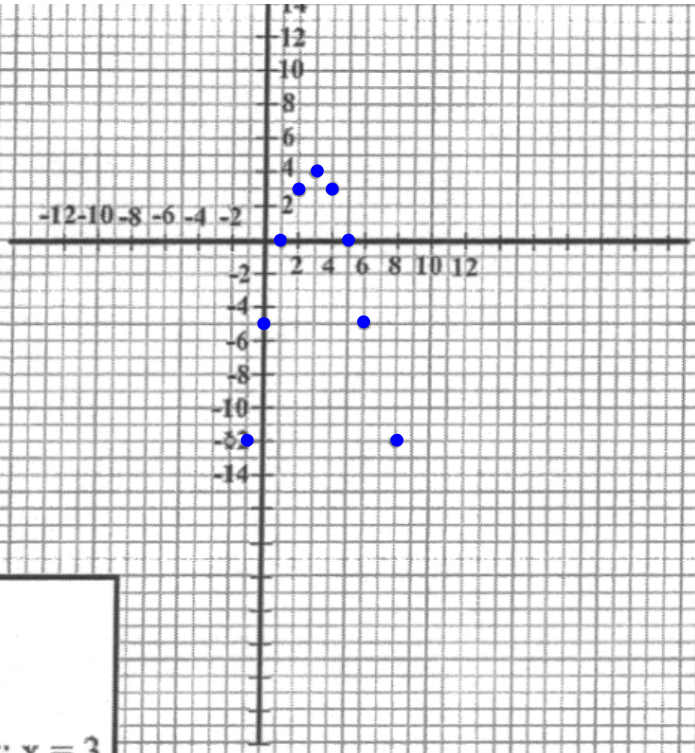
Graph the following function:

$y = -x^2 + 6x - 5, \ -1 \leq x \leq 7$

Determine the following:

- Domain
- Range
- Coordinates of Vertex
- Equation of the Axis of Symmetry
- The Zeros of the function
- Maximum or Minimum Value

x	y
-1	-12
0	-5
1	0
2	3
3	4
4	3
5	0
6	-5
7	-12



Domain: $\{-1 \leq x \leq 7,\ x \in R\}$
Range: $\{-12 \leq y \leq 4,\ y \in R\}$
Coordinate of Vertex: (3, 4)
Equation of Axis of Symmetry: $x = 3$
Zeros of the Function: $x = 1, x = 5$
Maximum Value: (3, 4)

Example 2:

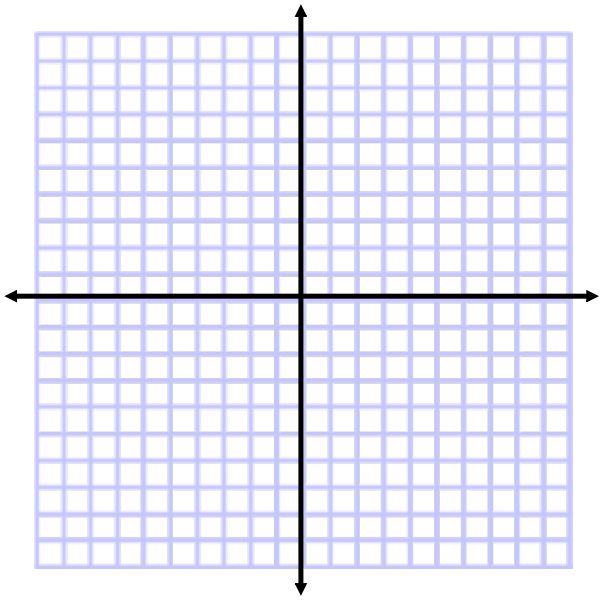
Graph the following function:

$y = 2x^2 + 1$

Determine the following:

- Domain
- Range
- Coordinates of Vertex
- Equation of the Axis of Symmetry
- Maximum or Minimum Value

x	y



- Domain
- Range
- Coordinates of Vertex
- Equation of the Axis of Symmetry
- Maximum or Minimum Value