

## Unit 4 : Graphing Quadratic Relations

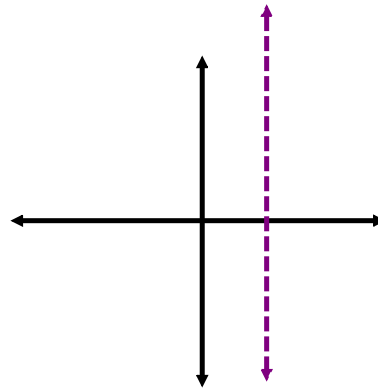
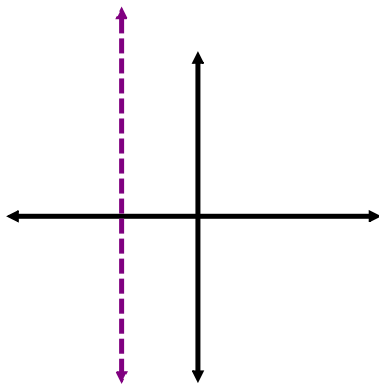
### Day 5: Properties of Quadratic Relations

Today we will:

- Learn the names of the parts of a Parabola
- Learn how to find some of the parts of a Parabola

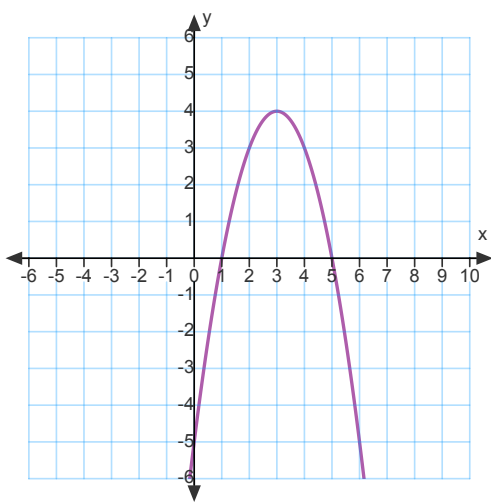
## TERMINOLOGY

- A quadratic relation is a polynomial of the form \_\_\_\_\_ where  $a, b, c$ , are any real numbers and  $a \neq 0$ .
- Quadratic relations have degree \_\_\_\_\_.
- The graph of a quadratic relation is a smooth, \_\_\_\_\_ curve called a \_\_\_\_\_.
- Parabolas can open \_\_\_\_\_ or \_\_\_\_\_.



- The \_\_\_\_\_ is the highest or lowest point on the parabola.
- The  $y$ -coordinate of the vertex is called the \_\_\_\_\_.
- It is a \_\_\_\_\_ when the parabola opens up.
- It is a \_\_\_\_\_ when the parabola opens down.
- The  $x$ -intercepts are called the \_\_\_\_\_ of the parabola.  
(This is because we find them by setting  $y = 0$ )
- The  $x$ -coordinate of the vertex gives us the \_\_\_\_\_ of \_\_\_\_\_.  
(The line that divides the parabola into 2 symmetric parts).  
We state it in terms of an equation: \_\_\_\_\_, where \_\_\_\_\_ is a constant and is the midpoint of the zeros..

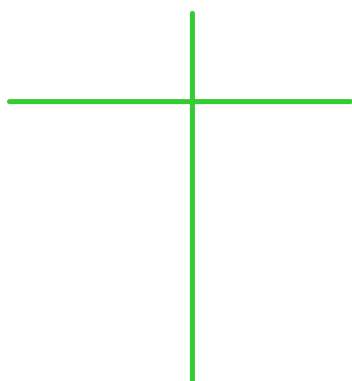
### Example 2



- a) What are the coordinates of the vertex?
- b) What is the optimum value? Is it a maximum or a minimum?
- c) What is the equation of the axis of symmetry?
- d) What are the zeros?
- e) If you calculated the second differences, what would their sign be?

**Example 3**

The pair of points  $(16, -2)$  and  $(-18, -2)$  lie on opposite sides of the same parabola.  
Determine the equation of the axis of symmetry.



**Skills Practice:**

Pg 254 # 5, 6

Page 266-269: #1, 2, 3, 5, 10(odds), 12a