

Characteristics of Quadratic Relations

Apr. 16/2010

Complete the TOV for each of the following:

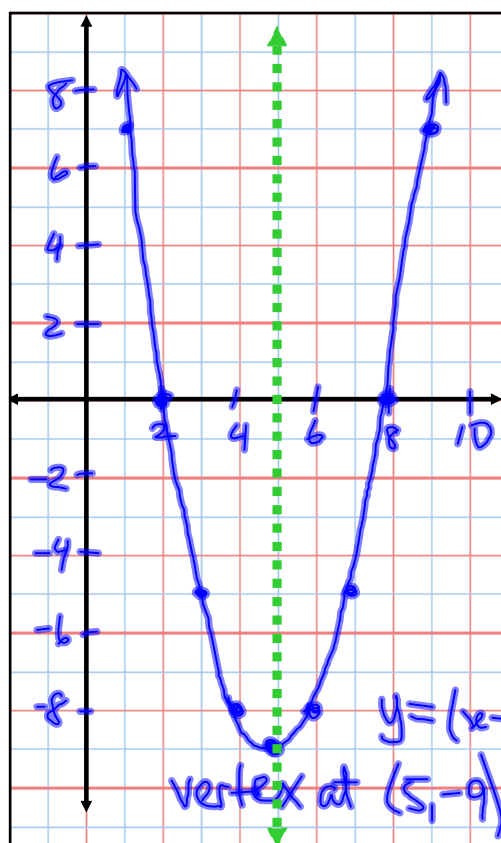
$$y = (x - 2)(x - 8)$$

x	y	Δy	$\Delta^2 y$
1	7		
2	0	-7	
3	-5	-5	2
4	-8	-3	2
5	-9	-1	2
6	-8	1	2
7	-5	3	2
8	0	5	2
9	7	7	2

$$y = -(x - 2)(x - 8)$$

x	y	Δy	$\Delta^2 y$
1	-7		
2	0	7	
3	5	5	-2
4	8	3	-2
5	9	1	-2
6	8	-1	-2
7	5	-3	-2
8	0	-5	-2
9	-7	-7	-2

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Sketch the graph of each relation.
Try to determine:

(1) the vertex $(5, -9)$
(the (x, y) coordinates of an important point)

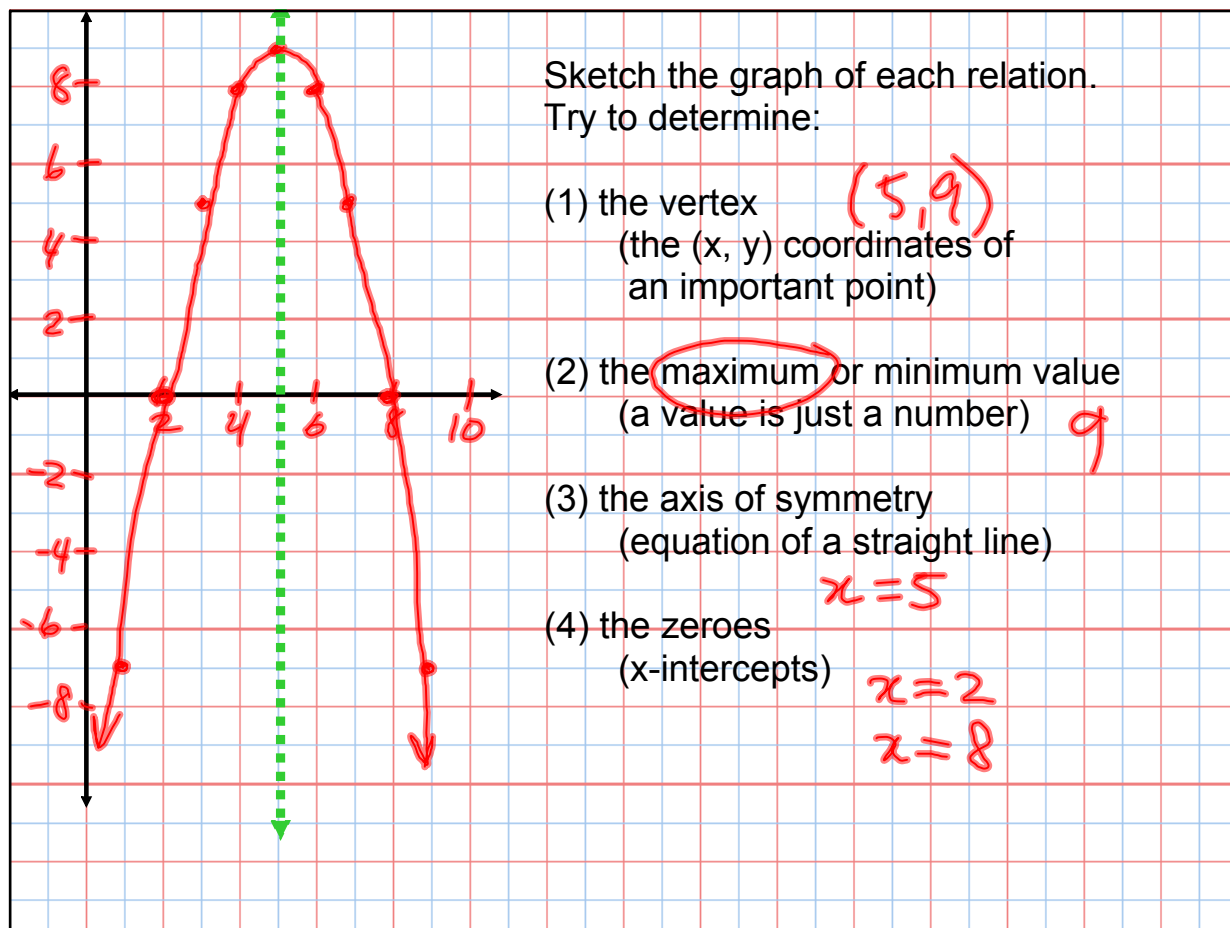
(2) the maximum or minimum value
(a value is just a number)

minimum value -9
(3) the axis of symmetry
(equation of a straight line)

$x = 5$
(4) the zeroes
(x-intercepts)

$x = 2$
 $x = 8$

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The vertex is the highest or lowest point on the parabola, and we refer to its coordinates as (h, k) .

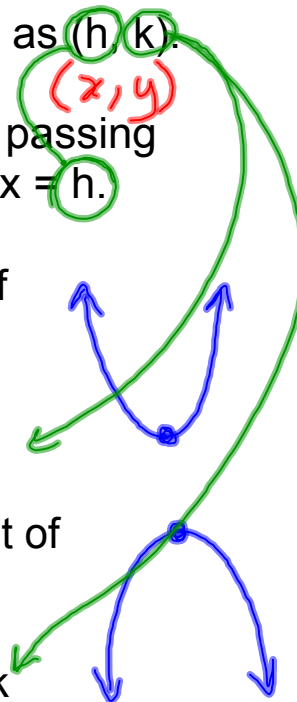
The axis of symmetry is the vertical line passing through the vertex, having the equation $x = h$.

If the parabola opens up, the coefficient of x^2 is positive ($\Delta^2 y > 0$)

- the vertex is the lowest point
- the minimum (or optimum) value is k

If the parabola opens down, the coefficient of x^2 is negative ($\Delta^2 y < 0$):

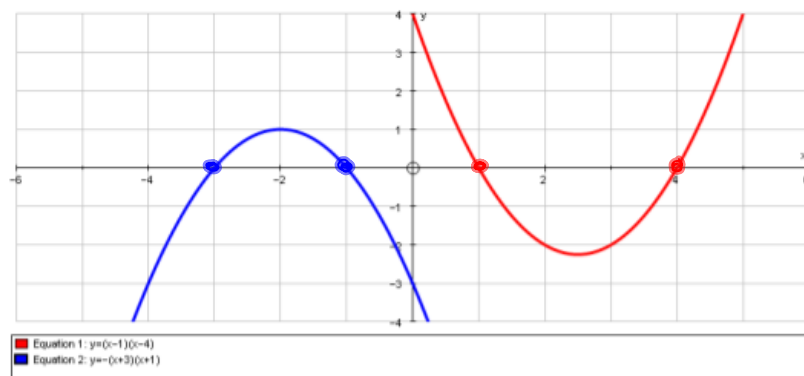
- the vertex is the highest point
- the maximum (or optimum) value is k



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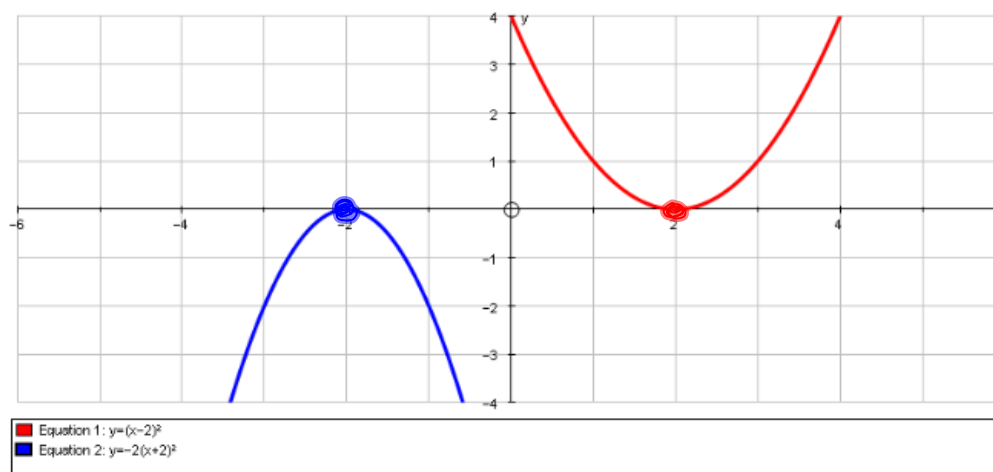
If the parabola crosses the x-axis, the x-coordinates of the crossing points are called the zeroes, or roots, or x-intercepts.

A parabola may have two zeros:



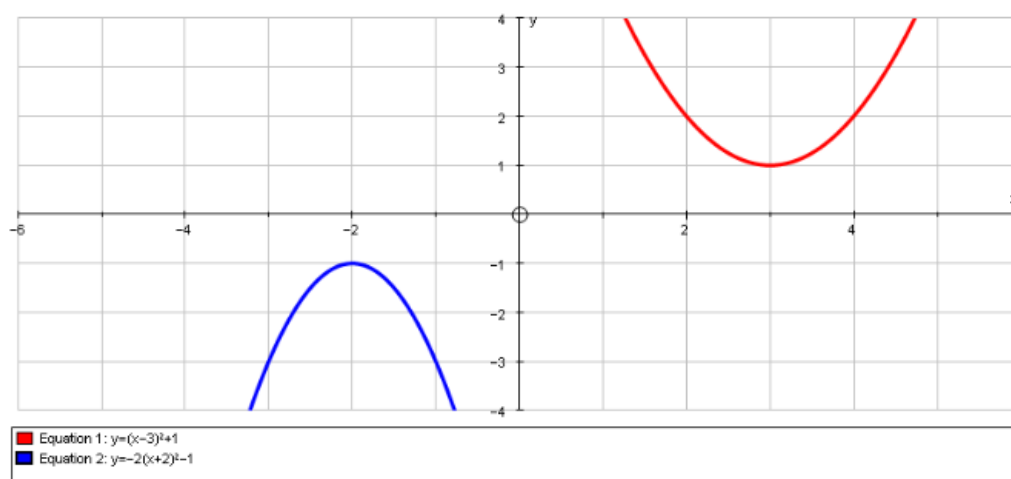
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Or one zero:



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Or no zeroes:



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Assigned Work:

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