Quadratics superdocument

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MPM2DE-B

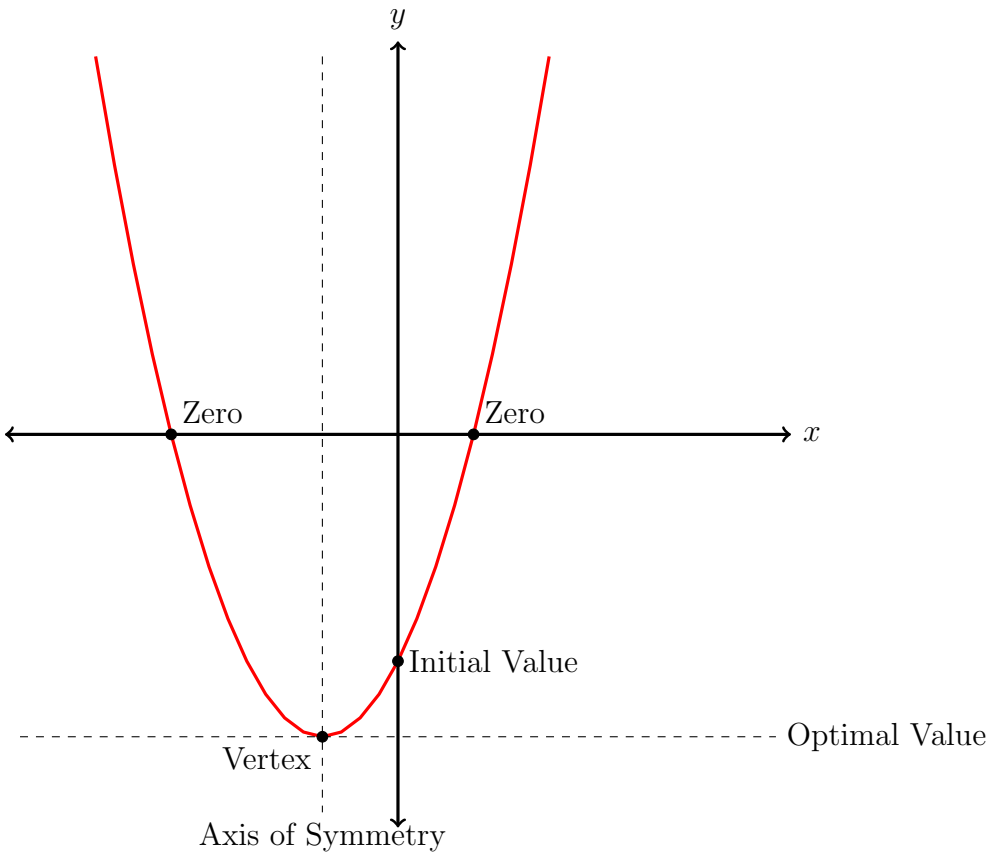
Contents

1 Conic sections

2 Features of parabolas

3 Recognizing parabolas

3.1 Identifying features of a parabola



4 Standard equation form

4.1 The base parabola

The most basic and simple equation for a parabola is as follows:

$$\boxed{y = x^2}$$

4.2 The factored form

The factored form would involve an equation that has a product.

$$\boxed{y = a(x - s)(x - t)}$$

Factored form is useful because it directly gives the roots, which will be s and t.

4.3 The standard form

The standard form is as follows:

$$\boxed{y = ax^2 + bx + c} \text{ where } a, b, c \in \mathbb{R}$$

You can express any degree of polynomial with this standard form and it's easy to do many different types of computation with it.
The parabola opens up if $a > 0$ and down if $a < 0$. The parabola is vertically stretched is $|a| > 0$ and compressed if $0 < |a| < 1$. c gives the y-intercept of the parabola.

4.4 The vertex form

The vertex form is as follows:

$$\boxed{y = a(x - h)^2 + k}$$

This equation form allows for a much easier visualization and drawing of the parabola from the equation, without any rearrangement.
The optimum value is k, the axis of symmetry lovation is h, and the vertex is located at (h, k). The value of a determines the same properties of the parabola as it does in the standard form. The parabola opens up if $a > 0$ and down if $a < 0$. The parabola is vertically stretched is $|a| > 0$ and compressed if $0 < |a| < 1$.