Quadratics

The factorised form

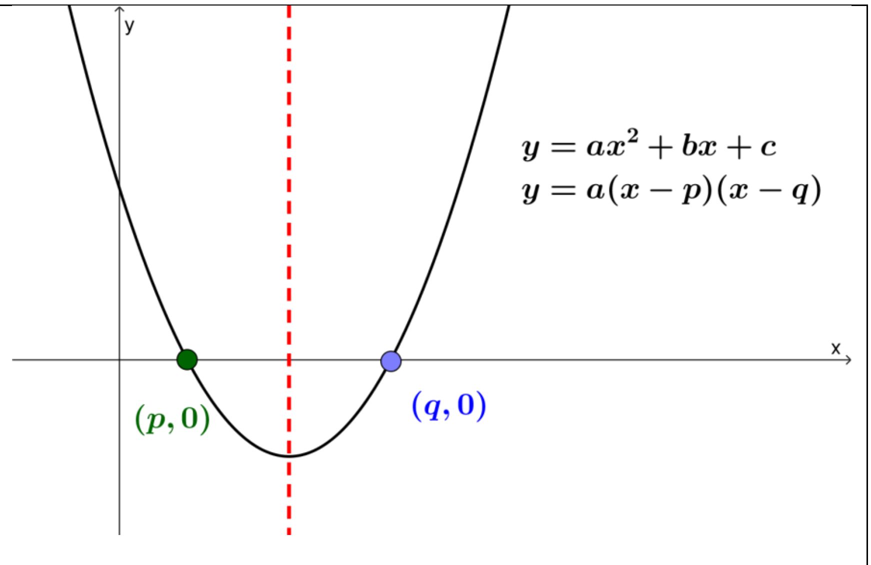
$y = a(x - p)(x - q)$

gives us the roots

$x = \mathrm{p}$ and $x = \mathrm{q}$

which form the

x intercepts $(p, 0)$, $(q, 0)$



The completed square form

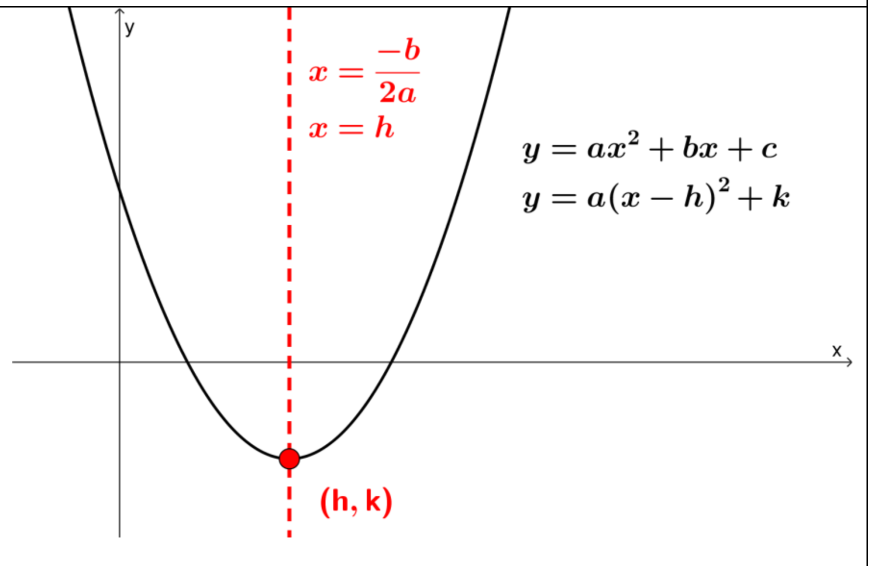
$y = a(x - h)^2 + k$

gives us the vertex (h, k)

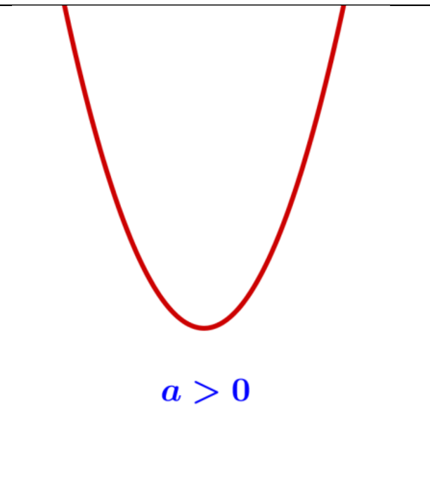
The line of symmetry of the graph

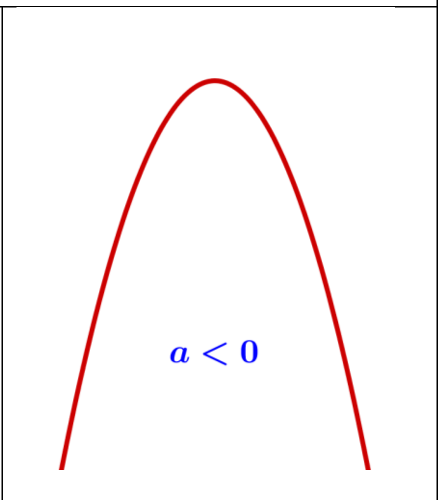
$y = ax^2 + bx + c$ is

$$x = -\frac{b}{2a}$$



The value of ***a*** determines the shape, whether there is a local maximum or local minimum

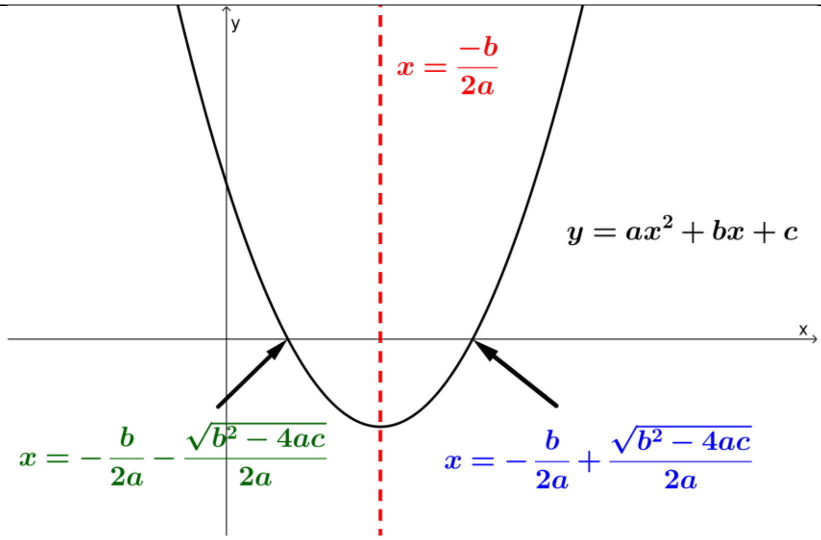




The roots of a quadratic equation

$ax^2 + bx + c = 0$ can be found using the quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



The discriminant,

$\Delta = b^2 - 4ac$ gives us information about the number of roots of a quadratic equation

$\Delta > 0$, two distinct roots

$\Delta = 0$, one repeated root

$\Delta < 0$, no real roots