

Used to find the zeros (x-intercepts)

Quadratic Formula

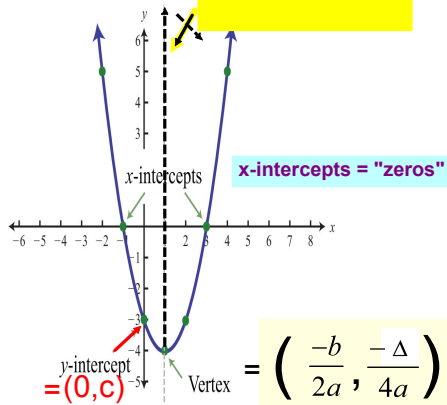
Example Equation

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

$$x^2 + 2x + 1 = 0$$

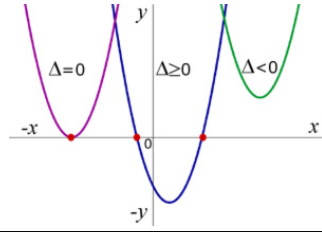
$\begin{matrix} \uparrow & \uparrow & \uparrow \\ a & b & c \end{matrix}$

Equation of axis of symmetry:
 $x=h$



Δ = discriminant = $b^2 - 4ac$

- if $b^2 - 4ac > 0$ 2 solutions
- if $b^2 - 4ac = 0$ 1 solution
- if $b^2 - 4ac < 0$ no real solution



The discriminant

$$B^2 - 4AC$$

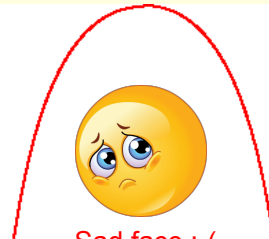
$$x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

Quadratic formula

Happy face!



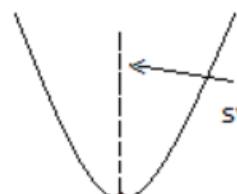
A quadratic function with $a > 0$



Sad face :-)

A quadratic function with $a < 0$

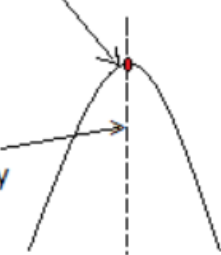
Open upward



vertex (minimum value)

Axis of symmetry

vertex (maximum value)



Open downward