Quadratic Equations/Functions

Roots of the equation

Zeros of the function

x-intercepts of the graph of the function.

Calculate the:

Roots of $x^2 + 3x - 4 = 0$ solve for x

zeros of $y = x^2 + 3x - 4$ make y=0 solve for x

x-intercepts of $y = x^2 + 3x - 4$ make y=0 solve for x

Solve $x^2 + 3x - 4 = 0$

$(x+4)(x-1) = 0$

$x+4=0$ | $x-1=0$

$x=-4$ | $x=1$

Solve: $x^2 - 4x - 5 = 0$ by graphing the corresponding function

$y = x^2 - 4x - 5$

vertex: $x = \frac{-b}{2a} = \frac{-(-4)}{2(1)} = \frac{4}{2} = 2$

$(2, -9)$

$y = (2)^2 - 4(2) - 5 = 4 - 8 - 5 = -9$

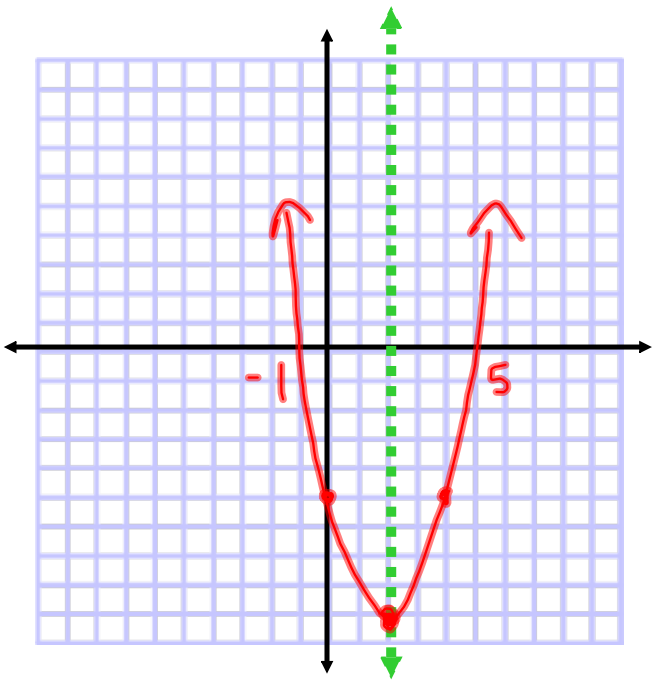
Solve algebraically

$x^2 - 4x - 5 = 0$

$(x + 1)(x - 5) = 0$

$x + 1 = 0 \quad x - 5 = 0$

$x = -1 \quad x = 5$



Another way to Solve ?

Ex: Solve by factoring: $x^2 - 9 = 0$

$(x-3)(x+3) = 0$

$x-3=0 \quad x+3=0$

$x=3 \quad x=-3$

Now solve: $x^2 - 5 = 0$

$x^2 = 5$

$\sqrt{x^2} = \sqrt{5}$

$|x| = \sqrt{5}$

$\pm x = \sqrt{5}$

so $x = \sqrt{5}$

and $-x = \sqrt{5}$ or $x = -\sqrt{5}$

we can simplify this by saying

if $x^2 = 5$

then $x = \pm\sqrt{5}$

Ex: Solve $3x^2 - 75 = 0$

$\frac{3x^2}{3} = \frac{75}{3}$

$\sqrt{x^2} = \sqrt{25}$

$x = \pm 5$

Ex: Solve $(x-3)^2 - 16 = 0$

$$(x-3)^2 = 16$$

$$\sqrt{(x-3)^2} = \pm\sqrt{16}$$

$$x-3 = \pm 4$$

$$x = 3 \pm 4$$

So $x = 3+4 = 7$ and $x = 3-4 = -1$