

Quadratic:

$$ax^2 + bx + c$$

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

↙ ↘
a is + a is -



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

↗
quadratic
formula "practice"

FACTOR

$$x^2 + 4x + 3$$

SOLVE

$$x^2 = -4x - 3$$

GRAPH

$$y = x^2 + 4x + 3$$

Another Example:

$$3x^2 + 7x + 2$$

$$\downarrow \quad \downarrow$$

$$1x \cdot 3x \quad 2 \cdot 1$$

$$(1x \quad \quad)(3x \quad \quad)$$

Guess & Check to place 2's!

$$(1x + 1)(3x + 2)$$

No.

$$3x^2 + 3x + 2x + 2$$

$$\text{ans: } (1x + 2)(3x + 1)$$

$$3x^2 + 6x + 1x + 2$$

$$x^2 + 4x + 3$$

add to 4... mult to 3

$$\text{ans: } (x+3)(x+1)$$

① With Calculator:

$$x^2 = 4x - 3$$

Solve for 0...

$$x^2 = -4x - 3$$

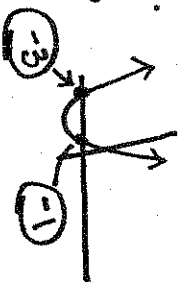
$$+4x + 3 \quad +4x + 3$$

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

look for where it crosses

x-axis...

2nd [Trace] - zero



② by hand:

$$x^2 = -4x - 3$$

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

$$(x+3)(x+1) = 0$$

$$x+3 = 0 \quad \text{or} \quad x+1 = 0$$

$$x = -3 \quad \text{or} \quad x = -1$$

① With calculator

$$y = x^2 + 4x + 3$$

put in y =

press [graph]

use "table" (2nd graph)

to locate at least 5

points... including

roots/zeros and vertex.

(use calc to find max/min)

② By hand $y = x^2 + 4x + 3$

① solve to find zeros...

use solve tab...

$$\text{roots} \rightarrow x = -1, x = -3$$

② find y-int (a.k.a the "c")

$$y\text{-int} \rightarrow (0, 3)$$

③ find x-coordinate of vertex (average of roots)

$$x = -2$$

④ find y-coord. of vertex...

$$y = (-2)^2 + 4(-2) + 3$$

$$= 4 - 8 + 3 = -1$$

⑤ plot zeros, vertex, vertex (-2, -1)