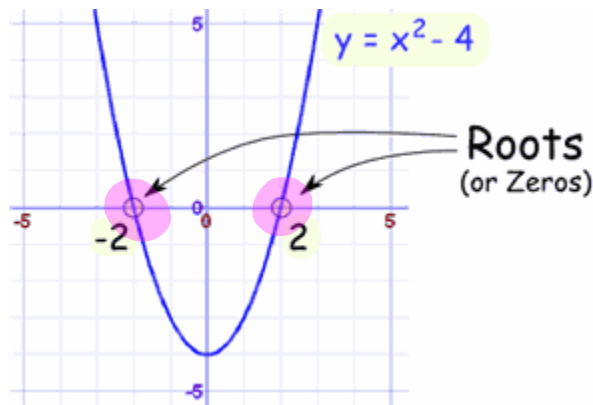# U3:L4 Quadratic Solutions and Roots
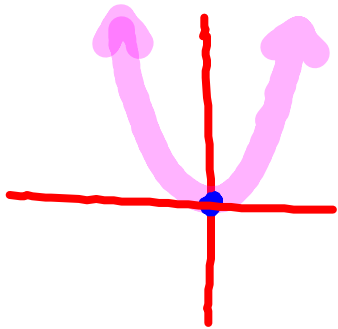
"Solving" quadratic equations is synonymous with **finding roots** of the quadratic equation. This happens when...
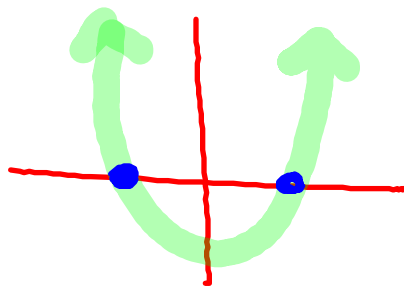
$$0 = ax^2 + bx + c$$

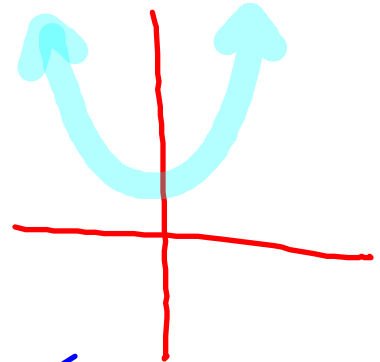When you solve for y=0, you are finding the **x intercepts** of the parabola.

$y = x^2 - 4$

Roots (or Zeros)

-2   2

There are three options of solving quadratics. You can either have...

1 ROOT   **2 ROOTS**   **Ø ROOTS**

There are two different methods for solving the roots:

1) **Table of values + graph**
2) **Desmos App**

Once solved, you can verify the roots by plugging the x-values back into the original quadratic equation when y=0.

Try on Desmos:

a) $f(x) = -x^2 + 8x - 16$
b) Verify by plugging the x-values back in...

1 ROOT
(4,0)

$y = -x^2 + 8x - 16$
$0 = -(4)^2 + 8(4) - 16$
$0 = -16 + 32 - 16$
$0 = 16 - 16$
$0 = 0$ ✓

Try by graphing on your own:

$+a$ OPEN ↑
c y intercept (0,9)

a) $f(x) = x^2 - 6x + 9$

X	Y
0	9
1	4
2	1
3	0
4	1
5	4
6	9
7	

★

1 ROOT @ (3,0)

$y = x^2 - 6x + 9$
$0 = (3)^2 - 6(3) + 9$
$0 = 9 - 18 + 9$
$0 = -9 + 9$
$0 = 0$ ✓

Solve the roots:

a) $2x^2 + x = -2$

*What is the essential first step?

→ Solve for $y = 0$

$\star$ Rearrange the equation

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

x	y
-2	6
-1	3
0	2
1	5
2	12
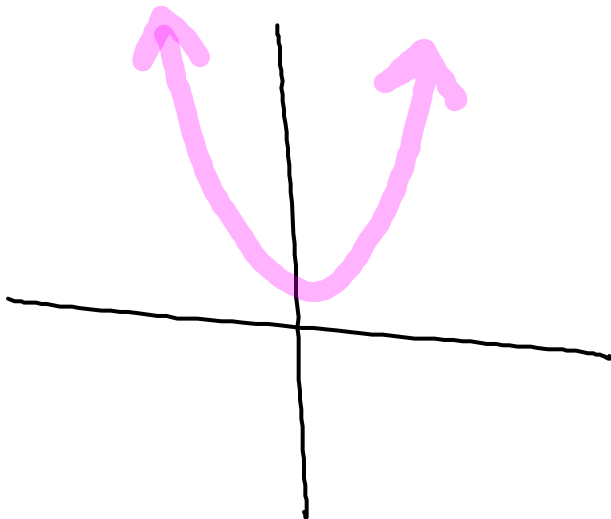
No Roots because function does not intercept X-axis

Practice: Page 215: Q 1, 2 and 6