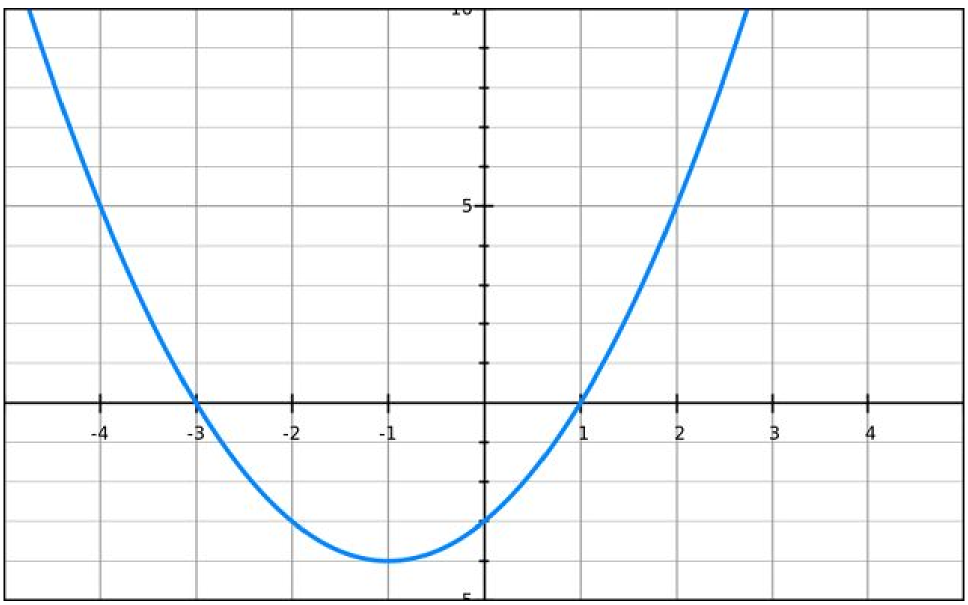
Solving Quadratics via Graph



When we say "solving" we are trying to find the places that the parabola crosses the x-axis. This is also called the "zeroes" or the "roots".

A quadratic equation is a <u>2nd</u> degree polynomial.

In standard form, $ax^2 + bx + c = 0$, it is not obvious what the parabola will look like.

We complete the square so we can see it.

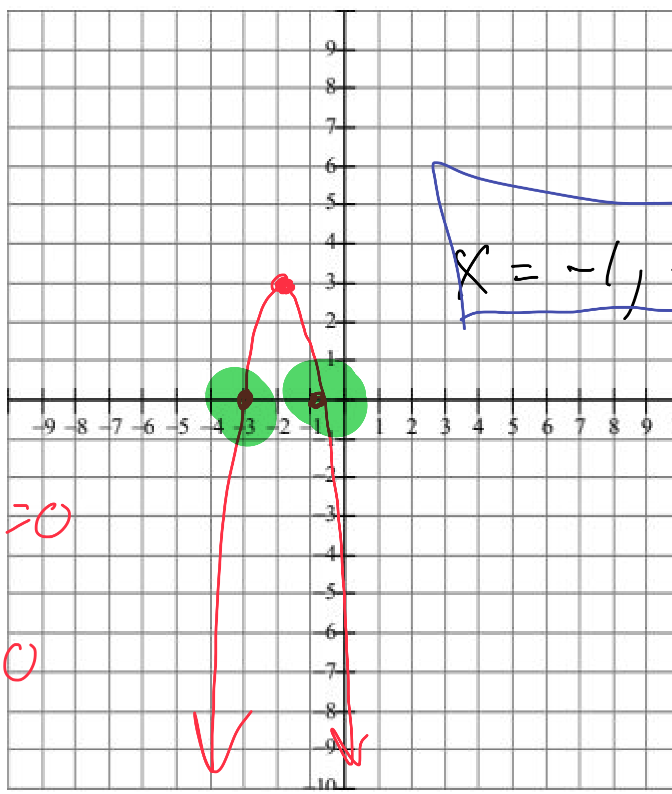
$$-3x^2 - 12x - 9 = 0$$

$= -3(x^2 + 4x) - 9 = 0$

$= -3(x^2 + 4x + 4 - 4) - 9 = 0$

$= -3(x+2)^2 - 4(-3) - 9 = 0$

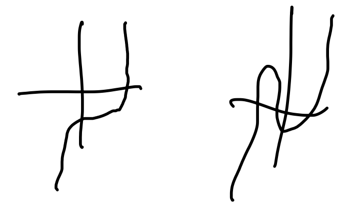
$= -3(x+2)^2 + 3 = 0$



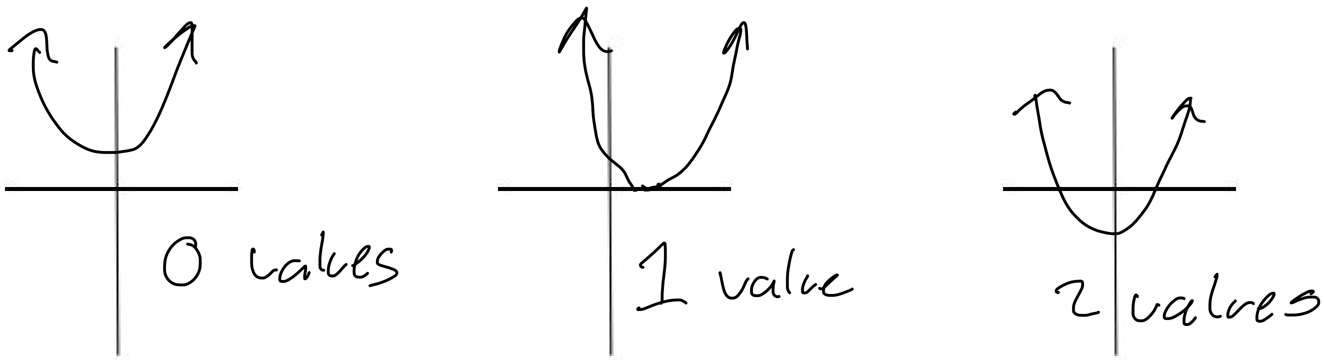
$\boxed{x = -1, -3}$

$-3(-1)^2 - 12(-1) - 9 = 0$

$x^3 =$



Will we always have 2 x-intercepts?



Lets try another:

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

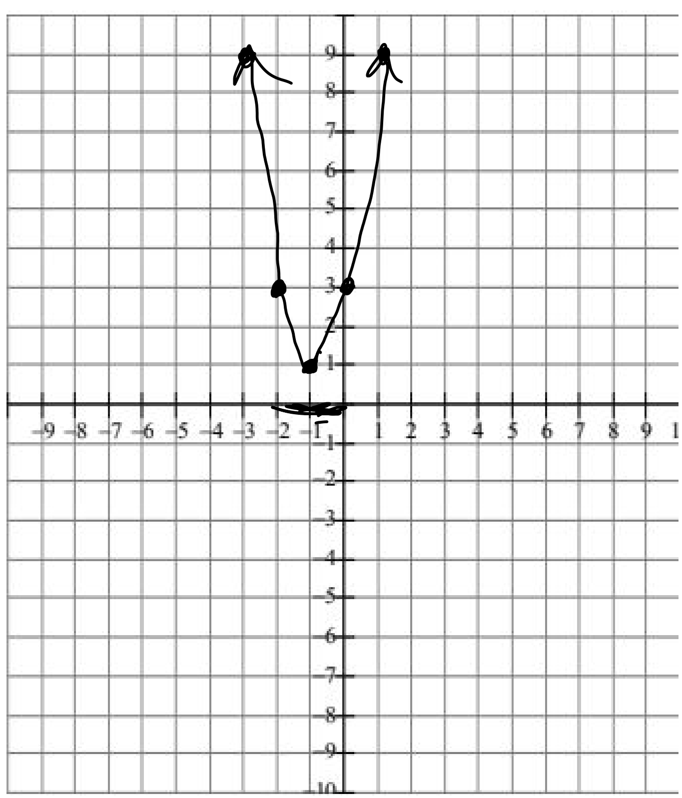
$2(x^2 + 2x \quad) + 3 = 0$

$2(x + 1)^2 - 1(2) + 3 = 0$

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

No Real Roots

DNE $(x \in R)$ $\mathbb{R}$



Homework: Solve the following by graphing.

1. $x^2 + 6x + 5 = 0$

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

3. $0 = x^2 - 2x + 2$

4. $x^2 + 4x = 5$

5. $-x^2 + 2x - 1 = 0$

6. $2x^2 = -8x - 6$

Also, Pg 215
#1, 2, 17, 18