

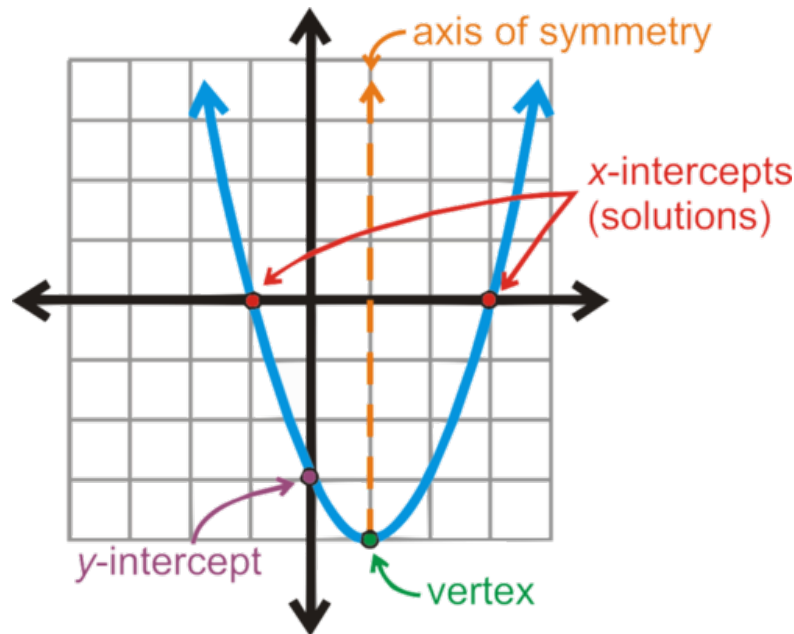
# Objective

Students will be able to factor a trinomial where the leading coefficient is equal to 1.

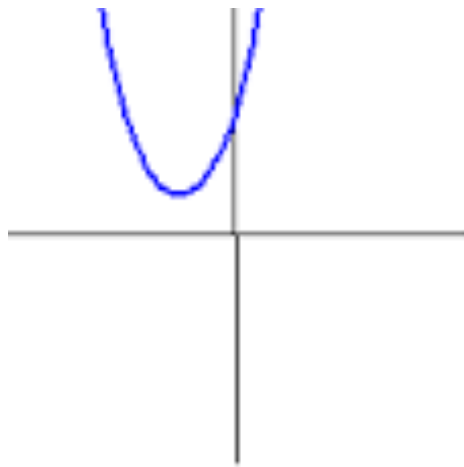
# Intro to Quadratics

A quadratic equation in one variable can be written in the form  $ax^2 + bx + c = 0$  where  $a \neq 0$  (written in standard form). The solutions of a quadratic equation are called the roots, solutions, x-intercepts, and zeros of the equation.

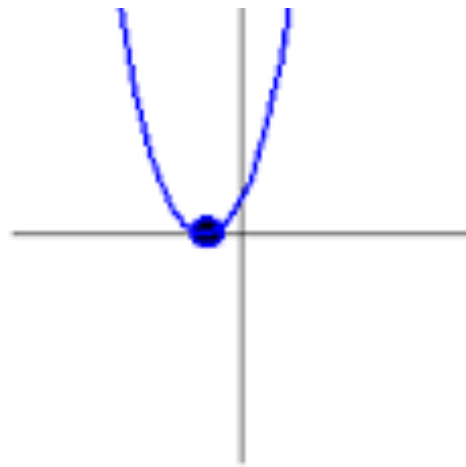
The graph of a quadratic equation is a parabola



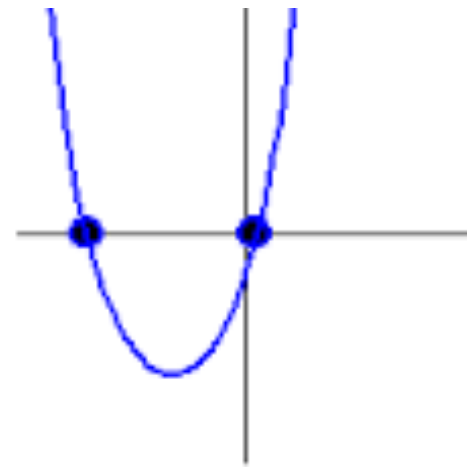
# How many solutions can a quadratic equation have?



No Solutions



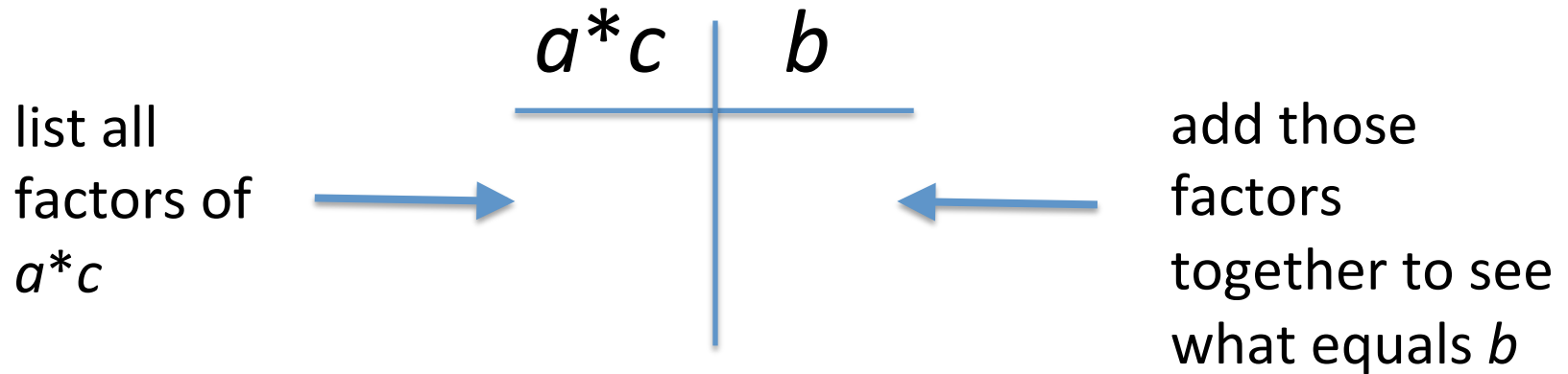
One Solution



Two Solutions

# Factoring a trinomial

To factor a trinomial  $ax^2 + bx + c$ , we need two numbers that multiply together to equal  $a*c$  and add together to equal  $b$



$$x^2 + 5x + 6$$

$a*c$	$b$
6	5
1, 6	7
2, 3	5

$$= (x + 2)(x + 3)$$

**You can check to see if your factors are correct by FOIL-ing**

An expression that cannot be factored is considered prime.

# Examples:

1)  $x^2 - 3x - 18$

$a*c$	$b$
-18	-3
-9, 2	-7
9, -2	7
-18, 1	-17
18, 1	17
-6, 3	-3
6, -3	3

$$= (x - 6)(x + 3)$$

2)  $b^2 - 11b + 28$

$$= (b - 4)(b - 7)$$


3)  $c^2 + 2c + 4$

prime

$a*c$	$b$
4	2
2, 2	4
1, 4	5

$a*c$	$b$
28	-11
1, 28	29
2, 14	16
4, 7	11
-4, -7	-11
-2, -14	-16
-1, -28	-29

# Difference of Two Squares

$$a^2 - b^2 = (a + b)(a - b)$$


has to be subtraction

**\*\***  $a^2$  and  $b^2$  are perfect squares

Example:

$$x^2 - 4 = (x + 2)(x - 2)$$

# Homework

Factoring Trinomials and Difference of  
Two Squares WS



# Objective

Students will be able to factor a trinomial where the leading coefficient is greater than 1.

First math team practice is Tuesday, September 20<sup>th</sup> at 3:30 pm in room 305

# Greatest Common Factor

A whole number that is a factor of two or more nonzero whole numbers is a common factor of the numbers. The largest of the common factors is the greatest common factor (GCF).

What is the GCF of 12 and 16? 4

What is the GCF of  $4a$  and  $2a$ ?  $2a$

# GCF when Factoring

When you factor any relation, you should  
**pull out the GCF as your first step!**

For the following examples, what is the GCF and how would your first step to factoring look like?

$$1) \quad 2x^2 + 2x + 4 \qquad \text{GCF} = 2 \qquad 2(x^2 + x + 2)$$

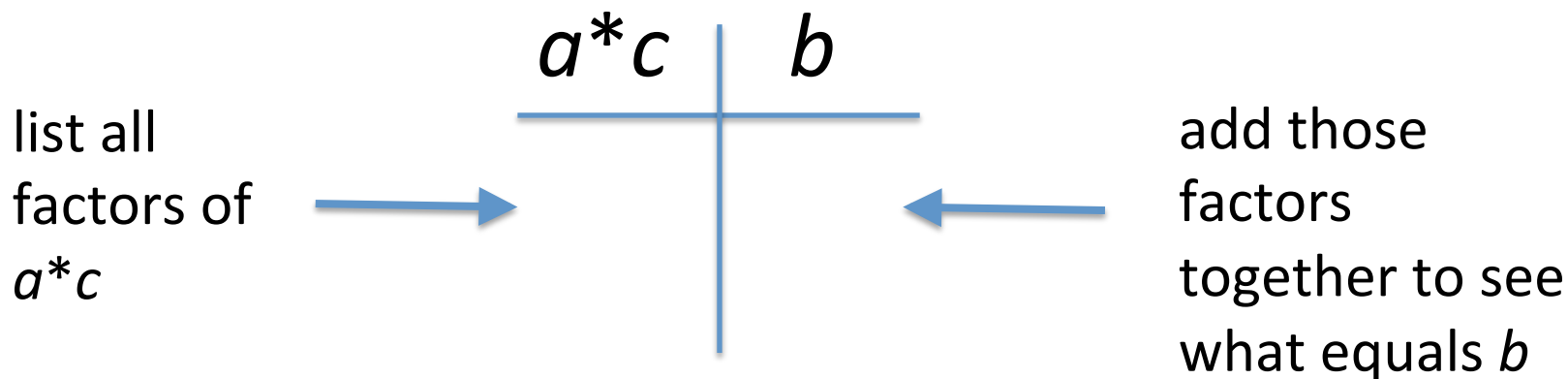
$$2) \quad 3x^2 - 30x + 15 \qquad \text{GCF} = 3 \qquad 3(x^2 - 10x + 5)$$

$$3) \quad 24x^3 + 30x^2 - 12x \qquad \text{GCF} = 6x \qquad 6x(4x^2 + 5x - 2)$$

**\*\*Pulling out a GCF is like the opposite of distributing**

# Factoring a trinomial ( $a > 1$ )

To factor a trinomial  $ax^2 + bx + c$  where  $a > 1$ , we need two numbers that multiply together to equal  $a*c$  and add together to equal  $b$



**HOWEVER**, now that  $a > 1$ , these factors are what we use to split the middle term (factor by grouping)!

# Factoring when $a > 1$

Example:

$a*c$	$b$
$2*3$	
6	7
6, 1	7

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

1) split the middle term

2) factor by grouping

3) GCF of each group

$$(2x^2 + 6x) + (x + 3) =$$

$$2x(x + 3) + (x + 3) =$$

want these to be the same in order to take out the GCF again

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

# Rally Coach

With a partner, factor the following problems. One of you will be writing while the other one listens and watches you solve the problem. The partner that is watching should be coaching their partner and praising them for good work. Once you finish a problem, switch roles.

Partner One:

1)  $6x^2y + 3xy - 12y$

2)  $8c^2 - 10c - 3$

3)  $-12x^2 + 22x - 8$

Partner Two:

1)  $8a^3b + 10ab - 4a^2b$

2)  $6x^2 + 19x + 10$

3)  $-8b^2 + 28b + 60$

# Rally Coach Answers

Partner One:

1)  $3y(2x^2 + x - 4)$

2)  $(4c + 1)(2c - 3)$

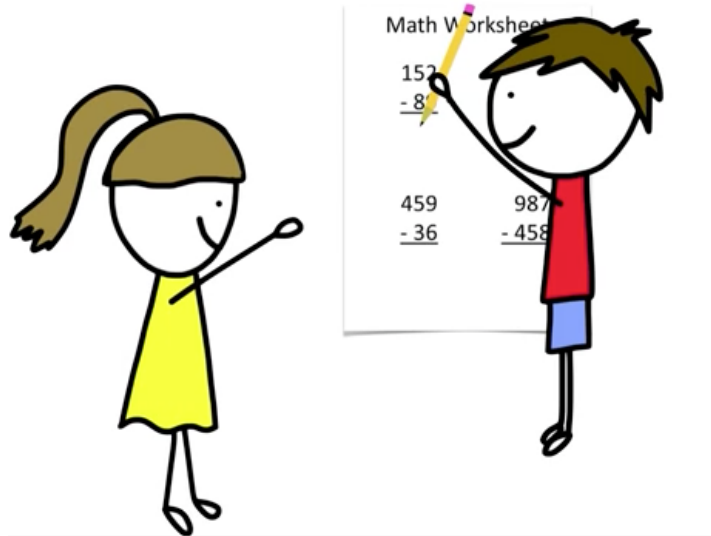
3)  $2(-2x + 1)(3x - 4)$

Partner Two:

1)  $2ab(4a^2 + 5 - 2a)$

2)  $(3x + 2)(2x + 5)$

3)  $4(-x + 5)(2x + 3)$



# Homework

Day 2: GCF & Factoring Trinomials a > 1 WS

**QUIZ** on Algebra Review on **Tuesday!**

Class notes are posted on my website!