


# Factoring

GCF,  $a=1$ ,  
Difference of Squares


## Quadratic Equations

**Standard Form:**  $ax^2 + bx + c$ ; where  $a=1$

**Shape:**



$a > 1$



$a < 1$

**Factor:** means to write quadratic into two binomials multiplied together.

## Notes on Factoring

**Steps:**

- Factor a GCF if there is one
- Check to see if there are two perfect squares that are separated by subtraction; if so use difference of squares (addition can not be done)
- Check to see if  $a=1$ ; if so use the Diamond Method

## Other Things to Remember:

Factor the polynomial into two binomials.

You can check your answer by multiplying the binomials back together!

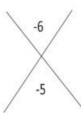
**Factors** are in the form:  $(x-a)(x-b)$

Go through the steps for each problem to ensure the correct factoring method!

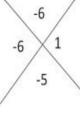
## DIAMOND METHOD

- The coefficient needs to equal 1.
- Draw the Diamond. Put  $a$  at the top and  $c$  at the bottom.
- Next, search for two factors of  $c$  that if multiplied together will equal  $c$  and add up to get  $b$ .
- Once you find the two factors, then write the factors in two binomials multiplied together.

**Ex:**  $x^2 - 5x - 6$






**Factors:**  
1 and -6,  
-1 and 6,  
2 and -3,  
-2 and 3



**SOLUTION:**  
 $(x - 6)(x + 1)$

Factors of 6 multiplied to get -5

## EXAMPLES

$a^2 - 5a - 24$	$x^2 + 4xy - 12y^2$	$p^2 + 14p + 40$
		

[http://edmentum.com/Files/2013/12/Workshop\\_Factoring\\_Tutorial\\_41.pdf](http://edmentum.com/Files/2013/12/Workshop_Factoring_Tutorial_41.pdf)

## GCF: Greatest Common Factor

- Find the greatest common factor among all the monomials,  $a$  has to be positive.
- Divide each monomial by the GCF.

**EX:**  $3xy^2 + 9x^2y - 12xy$

What do all three monomials have in common?  $3xy$

Factor the  $3xy$  out of the trinomial.  $3xy(y + 3x - 4)$

Factor each completely. (Remember to pull out the GCF first.)

$-16p^3q^2 + 24p^2q^3 - 32p^4q$	$12w^3t^2 - 9wt^2 + 15w^2t^3$
$2p^2 + 14p + 24$	$8xy(d - 12) - 9z(12 - d)$

[http://edmentum.com/Files/2013/12/Workshop\\_Factoring\\_Tutorial\\_41.pdf](http://edmentum.com/Files/2013/12/Workshop_Factoring_Tutorial_41.pdf)

## DIFFERENCE OF SQUARES

$$a^2 - b^2 = (\sqrt{a} - \sqrt{b})(\sqrt{a} + \sqrt{b})$$

EX:  $x^2 - 64$

Both terms are perfect squares and subtracted.

Take the square root of each a and b and write the monomials as a difference of squares.

SOLUTION:  $(x - 8)(x + 8)$

$$9k^2 - 1$$

$$36x^2 - 25$$

$$5a^2 - 180$$

## YOUR TURN:

Go to Kahoot.It

Pin: \_\_\_\_\_

You are going to work through problems and select your answer through Kahoot!

## Algebra Connect - Factoring Trinomials



- As a pair, you will decide who goes first by tossing a die.
- The first player tosses both dice and locates the corresponding box on the game board. For example, if the player tosses a 3 and a 4, they may go to the 3rd row, 4th column, or the 4th row, 3rd column.
- The player solves the problem and checks with teacher to see if answer is correct. If correct, partner colors in the space with the problem and writes the answer in the box. If incorrect, the other player can steal the box by giving the correct solution and then color in the box with their color along with the answer.
- If a player tosses the dice and the box indicated is already occupied, the player rolls the dice again.
- The winner is the player who has the most colored in spots in game board.

## Homework



GCF and Factoring  
Worksheet  
#2-30 even

$$a^2 - b^2 = (\sqrt{a} - \sqrt{b})(\sqrt{a} + \sqrt{b})$$