BIG IDEA I will be able to factor quadratic expressions.

AGENDA

Learning Goal: I will be able to factor algebraic expressions by dividing out the greatest common factor.

Minds on	Area Activity + GCF
Action!	Factoring Day 1 - common factors
Consolidation	Practice and exit question

New Unit

Factoring Polynomials

Minds on

Common Factors in Polynomials

A customer orders two rugs. One with an area of $10m^2$ and the other with an area of $15m^2$.

What are the possible dimensions with only whole numbers?

$10m^2$	$15m^2$
5×2	3×5
10×1	15×1

Minds on

Find the Greatest Common Factor (GCF) of each pair:

1, 2, 4 1, 2, 4, 5, 10, 20

4 and 20 = 4

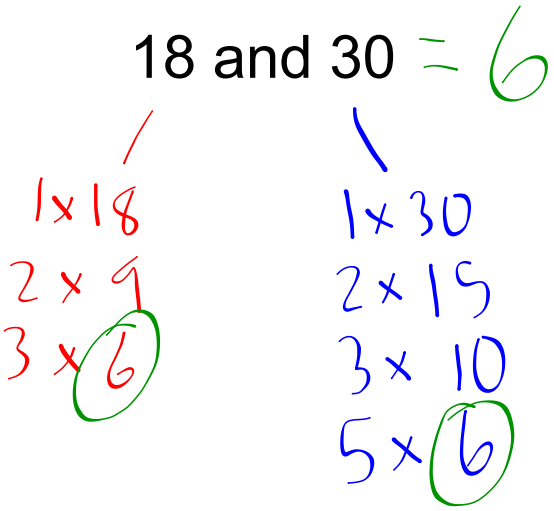
2 x 2
1 x 4

5 x 4
10 x 2
20 x 1

Minds on

Find the Greatest Common Factor (GCF) of each pair:

18 and 30 = 6



Minds on

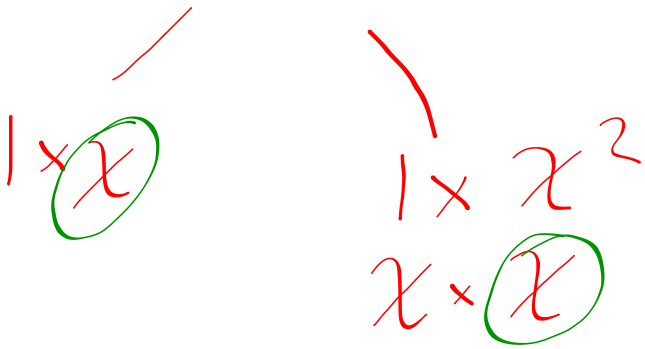
Find the Greatest Common Factor (GCF) of each pair:

30 and 75

Minds on

Find the Greatest Common Factor (GCF) of each pair:

x and x^2



Minds on

Find the Greatest Common Factor (GCF) of each pair:

$3x^2$ and $6x^3$

Look for largest number in common
Look for largest variable in common

$3x^2$

Greatest Common Factor

$6x$ and $9x^2$

$3x$

$15x^2$ and $10x^3$

$5x^2$

$8x^2y^2$ and $12xy^3$

$4xy^2$

Divide

$$\frac{10x^2}{5x} = 2x$$

$$\frac{15x^3}{5x} = 3x^2$$

$$\frac{18x^4}{-6x^3} = -3x$$

$$\frac{20x^2y^3}{4xy} = 5xy^2$$

Minds on

Chapter 4 - Factoring Algebraic Expressions

- Definition Match-Up – Match words at the bottom of the page to the definitions in the table:

Word	Definition	Examples
Factor	To express a number as the product of two or more numbers, or express an algebraic expression as the product of two or more terms.	
Decompose	Break a number or an expression into the parts that make it up.	

- Decompose
- Factor

Minds on

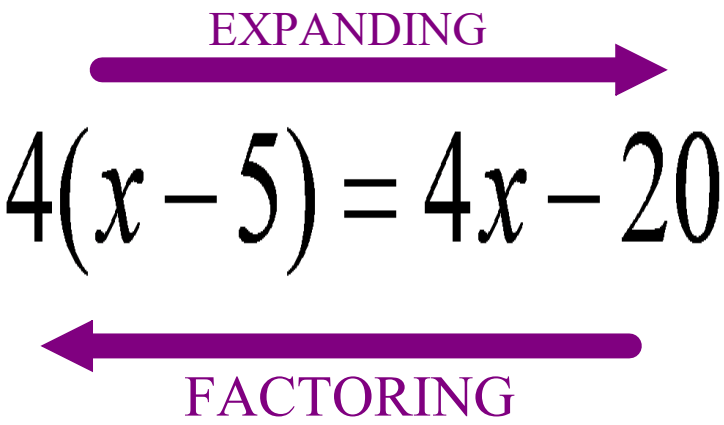
Recall:

Distributive Property:

4(x+3) = 4x+12

This uses multiplying and called EXPANDING

The reverse of this process is called FACTORING and it is based on division.



Action!

When we factor, we need to find the GCF in order to complete the task.

$5x^2 - 20x$ GCF= $5x$

Factoring gives:

$5x(x - 4)$

Notice the GCF is written in front and each term is divided by this value.

Action!

Example 1: Factor.

a) $3x^2 - 6x$

GCF: $3x$

$3x \cdot x = 3x^2$

$3x \cdot 2 = 6x$

$= 3x(x - 2)$

Action!

b) $10a^3 - 25a^2$

GCF $= 5a^2$

$= 5a^2(2a - 5)$

Action!

c) $9x^4y^4 + 12x^3y^2 - 6x^2y^3$

$3x^2y^2$ $3x^2y^2$ $3x^2y^2$

GCF = $3x^2y^2$

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

Action!

d) $5x(x - 2) - 3(x - 2)$

Both terms have $(x-2)$
So factor out $(x-2)$

$= (x-2)(5x-3)$

Action!

e) $ax - ay - 5x + 5y$

When we have 4 terms, break up into two pairs.

First two have 'a' in common.

Second two have -5 in common.

$= a(x-y) - 5(x-y)$

Now, both terms have $(x-y)$ in common.

$= (x-y)(a-5)$

Action!

I think you should see this to help motivate your levels of practice/homework...

Unit Overview:

Today: Common Factoring

Thursday: Simple Trinomial Factoring (harder)

Friday: Complex Trinomial Factoring (trickiest!)

Monday: Practice Period

Tuesday: Special Cases (multiple types)

Wednesday: Review

Thursday: Test!

Every type of factoring is completely different and follows its own set of steps, unrelated to the previous day's work.

Factor

$$5x^2 + 20x$$

$$= 5x(x+4)$$

$$15x^3 - 20x^2$$

$$= 5x^2(3x - 4)$$

$$4x^3y^4 - 8x^2y + 12x^3y^2$$

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

$$3x(x+1) - 5(x+1)$$

$$= (x+1)(3x-5)$$

*If there is a negative out front, factor out a negative!

$$-4x^2 + 8x$$

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

Break into pairs!

$$3x^2 - 3x \quad | \quad -5x + 5$$

$$= 3x(x-1) - 5(x-1)$$

$$= (x-1)(3x-5)$$

Consolidation

Practice: Pg. 203 #5ace, 6ace, 8, 11, 12, 19 (challenge)