Unit 2: Algebra and Number:

In this unit we will solve problems involving:

- square roots and cube roots
- integral and rational exponents
- irrational numbers, including radicals
- multiplying polynomials
- factoring polynomials

Chapter 5: Polynomials

Okay fair warning this chapter gets a little crazy... but we got this

5.1 Multiplying Polynomials... But first, just multiplying numbers

Quick! (13)(15) = ? No calculator!!

We can use the same method when multiplying polynomials.

(x+3)(x+1)=

Solve the following using the **area method**:

(x-3)(2x+1)

Method #2: Using the distributive property:

Notice the similarities?

Multiply (also called EXPAND) $(x-2y)(x-4y)$

Multiplying a binomial and a trinomial.. Same thing, more terms

$(x+2)(2x^2-5x+1)$

HMWK: Pg 209 #1, 3, 4, 6

yes you can do #6, I believe in you :)

5.1 Continued: The Word Problems

A circle is inset into a square with a side length of 6x+4.
Write an expression to represent the area of the circle.
Multiply, then combine like terms.

HMWK: Pg 210 # 7, 10, 12, 13, 18

5.2 Common Factors - GCF and LCM

What is the difference between a **multiple** and a **factor** of a number?

GREATEST COMMON FACTOR:
is the greatest factor that is common between two or more numbers Note: these DO NOT HAVE TO BE PRIME NUMBERS

Find the GCF of 84 and 140 using prime factorization

84, 140

Find the GCF of 220, 860

Find the GCF of $220x^2y$ and $860x$

Factor the polynomial by "removing" the GCF

$27r^2s^2 - 18r^3s^2 - 36rs^3$

HMWK: Pg 220 #2, 4-7, 11, 12

5.1 Word Problems and LCM

Find the Lowest Common Multiple of the following two numbers: 30 and 40

Determine least common multiple of 15, 32, 44

3 or more numbers - when factoring with a PRIME number it only has to divide TWO of the numbers... the third one just gets pulled down as follows...

What is the side length of the smallest square that could be tiled with rectangles that measure 16 cm by 40 cm? Assume the rectangles cannot be cut.

What is the side length of the largest square that could be used to tile a rectangle that measure 16 cm by 40 cm? Assume the squares cannot be cut.

HMWK: Pg 220 #3, 8, 13, 15, 16

5.3 Factoring Trinomials (This is the crazy part)

RECALL:

Expand → $3(2 - 5a) = 6 - 15a$

Factor → $6 - 15a = 3(2 - 5a)$

factoring and expanding are inverse processes

Review: Expand and Simplify (c+5)(c+3).

We can use multiplication of binomials (expanding) to inform how we factor polynomials.
Because expanding and factoring are inverse processes!

Recall 12x13=156

	10	3
10	100	30
2	20	6

100+30+20+6=156

Multiplying 12x13 =156,

therefore, 12 and 13 are both factors of 156.

Factoring in the form $x^2 + bx + c$

Let's look again at the area method for multiplying binomials...

Consider: How do we form the "b" value and the "c" value in the polynomial?

Multiply: (x+5)(x+3)

Since factoring and expanding are inverse processes,

we know we will end up with (x + an integer)(x + an integer) when we factor a polynomial in the form $x^2 + bx + c$

We also know by exploring the expanding process that the two integers in the binomial will **add up to** the **"b"** value and **multiply** to get the **"c"** value.

Let's try it!

Factor the following trinomial:

$x^2 - 8x + 7$

We we will need factors of + 7 that have a sum of -8.

Factor the trinomial ----watch out for the negative sign!

$a^2 + 7a - 18$

HMWK: SOLARO ASSIGNMENT

Factor: $-5x^2 - 20x + 60$

And remember no panicking - you can do this what we learned so far

More Factoring in the form $x^2 + bx + c$

Factoring worksheet - yay!

Note: NOT all trinomials are factorable! If our conditions can't be met then it can't be factored.

5.3 Factoring in the form $ax^2 + bx + c$

First things first though... expand and simplify this:

$(-2x + 8)(7 - 3x)$

Now, nice and slow, let's factor the trinomial

Remember: Factoring and expanding are inverse processes!

$4x^2 + 20x + 9$

Factor: $3x^2 + 8x + 4$

Factor: $24x^2 - 30x - 9$

HMWK: FACTORING WORKSHEET #2

5.3 Factoring in the form $ax^2 + bx + c$

WORK BLOCK --- Textbook Pg 236 #15, 16 (word problems)

--- Worksheet from last class

5.4 Factoring Special Trinomials

Difference of Squares: $u^2 - v^2$

A square term minus another square term.

Perfect Square Trinomial: $x^2 + 2\sqrt{c} + c$, where c is a perfect square

Difference of Squares -- easily recognized for having only 2 terms, both being squares

$x^2 - 9$

$16c^2 + 25a^2$

Perfect Square Trinomial: $x^2 + 2\sqrt{c} + c$, where c is also a perfect square

$$x^2 + 6x + 9$$

HMWK: Pg 246 #4, 5-6aceg, 8, 13, 14, 15

Factoring Review

Ch 5 Review

Ch 5 Review

Ch 5 Review