Factoring Polynomials

In This Unit:

1. GCF's (Greatest Common Factor)
2. x^2+bx+c
3. ax^2+bx+c
4. Special Product Patterns

Bellwork
3/20/12

Divide the polynomials.

1. $\dfrac{-12x^4+9x^2-27x}{-3x}$

$\dfrac{-12x^4}{-3x^1} + \dfrac{9x^2}{-3x^1} + \dfrac{-27x^1}{-3x^1}$

$4x^3-3x^1+9$

Lesson 12.1
GCF's

What You Need to Know:

A greatest common factor is the product of all the common factors.

To find the GCF of a polynomial, find what each term has in common.

The GCF of $7x^3-63x$ is $7x$.

If the first term of the polynomial (in standard form) is negative, the GCF should be negative because we never want a polynomial that starts with a negative. Boo!

Once you find the GCF, write it outside of the simplified polynomial...like *reverse distribution*.

$7x^3-63x$ simplified is $7x(x^2-9)$

GCF's

Write the polynomial in simplest form by finding the GCF.

$3w^3 - 75w$

$24y^3 + 32y$

$3a^2 + 30$

$-7t^5 - 14t^4 + 7t^3$

$2x^3 + 12x^2 + 18x$

Homework Assignment

Worksheet
"GCF's"

Bellwork
03/21/12

Write the polynomial in simplest form by finding the GCF.

1. $-8k^4+16k^3-64k^2$

Lesson 12.2
x^2+bx+c

What You Need to Know:

Tips for Signs:

x^2+bx+c	(+)(+)	
x^2-bx+c	(-)(-)	
x^2+bx-c	(-)(+)	or (+)(-)
x^2-bx-c	(-)(+)	or (+)(-)

In Order to Factor:

1. Standard Form?
2. Reduced (Distributive)?
3. Write as a product (Reverse Foil)!

How to Factor x^2+bx+c:

1. Factor the first term.
2. Factor the last term.
3. Find factors of the last term that add (or subtract) to give middle term.

x^2+bx+c

Factor the trinomial.

x^2+5x+6

x^2+6x+5

$x^2-7x+12$

$x^2-4x-12$

$x^2+3x-28$

$x^2+15x+56$

Homework Assignment

Worksheet
"Factoring x^2+bx+c"

Bellwork
03/26/12

Factor the polynomial.

1. $4x^4+36x^3+32x^2$

Lesson 12.3
ax^2+bx+c

What You Need to Know:

How to Factor ax^2+bx+c:

1. Factor the first term.
2. Factor the last term.
3. Find a combination of the factors of the 1st and last term that multiply and + (or -) to give the middle term.

It's trial and error! When in doubt, try any of the factors!

If the order you choose doesn't work, try this:

1. Switch the signs
2. Switch the order of the numbers
3. Try a different set of factors

ax^2+bx+c

Factor the trinomial.

$5x^2+11x+2$

$2x^2+5x+3$

$9x^2+65x+14$

$6x^2-23x+15$

$8x^2+38x+9$

Homework Assignment

Worksheet
"Factoring ax^2+bx+c"

Bellwork
03/28/12

Write the polynomial in simplest form by finding the GCF.

1. $-8k^4+16k^3-64k^2$

Bellwork
03/28/12

Factor.

1. $3x^2 - 23x - 8$

$3 \cdot -8 = -24$

$3 \mid 3$
$1 \mid 1$

$(3x + 1)(1x - 8)$

8: $1 \mid 8$, $2 \mid 4$

$+1x + -24x = -23x$ ✓

Lesson 12.4
Special Product Patterns

What You Need to Know:

Difference of Two Squares Pattern:

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

Perfect Square Trinomial Pattern:

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

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

You still need to simplify, if possible!

$x \cdot x = x^2$

Special Product Patterns

Factor the expression. Simplify first, if necessary!

m^2-9

$(m+3)(m-3)$

$49q^2-81$

$(7q+9)(7q-9)$

$\frac{2x^2+6x}{2x}$

$12-27x^2$

$-27x^2+12$

$-3(9x^2-4)$

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

$x^2-8x+16$

$(x-4)^2$

$-4x \cdot 2 = -8x$

$9y^2+60y+100$

$(3y+10)^2$

$\frac{2x^2-12x+18}{2}$

$\frac{2x^2}{2}+\frac{-12x}{2}+\frac{18}{2}$

$2(x^2-6x+9)$

$2(x-3)^2$

Homework Assignment

Worksheet
"Special Product Patterns"