Math 1010

#30 9/27/2012 - Sec 6.2

$6(a+2b)^2 - 4(a+2b)^3 + 12(a+2b)^4$

GCF: $2(a+2b)^2$

$2(a+2b)^2\left[3 - 2(a+2b) + 6(a+2b)^2\right]$

$(a+2b)(a+2b)$

$2(a+2b)^2\left(3 - 2a - 4b + 6(a^2 + 2ab + 2ab + 4b^2)\right)$

$4ab$

$2(a+2b)^2\left(3 - 2a - 4b + 6a^2 + 24ab + 24b^2\right)$

#54 $10ab - 21 - 6b + 35a$

~~$1(10ab - 21)$~~

$10ab - 6b - 21 + 35a$

$2b(5a-3) - 7(3-5a)$

$10ab - 6b + 35a - 21$

$2b(5a-3) + 7(5a-3)$

$(5a-3)(2b+7)$

Sec 6.2 Factoring Trinomials

Trinomial: 3 terms in my Polynomial

Factoring: is undoing the multiplication process

FOIL: multiplied 2 binomials together

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

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

$x^2 + x - 12$ ← trinomials

from F: x^2

combined O, I: x

From L: -12

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

Possible:

-12	add to $+1$
$1, -12$	-11
$-1, 12$	$+11$
$2, -6$	-4
$-2, 6$	$+4$
$3, -4$	-1
$-3, 4$	1 ✓

Steps to factor $x^2 + bx + c$

1st Find pairs whose product is c

2nd Find in the list of pairs, the pair whose sum is b

3rd Write our factored pairs

Ex: $x^2 + 3x + 9$

cannot be factored

multiply to get	add to get
+9	+3
~~1, 9~~	~~10~~
~~-1, -9~~	~~-10~~
~~3, 3~~	~~6~~
~~-3, -3~~	~~-6~~

Prime Polynomial

Ex: $x^2 + 12x + 32$

$(x+8)(x+4)$

multiply	add
+32	+12
8, 4	12 ✓

Ex: $a^2 - 9a + 20$

$(a-4)(a-5)$ ✓

Ex: $x^2 + 3bx - 10b^2$

$(x+5b)(x-2b)$

$-10b^2$	$+3b$
$5b, -2b$	$+3b$ ✓

Ex: $16y^3 - 32y^2 - 48y$

GCF: $16y$

$16y(y^2 - 2y - 3)$

$16y(y+1)(y-3)$

-3	-2
1, -3	-2 ✓
-1, 3	

$$ax^2 + bx + c$$

What to do if $a \neq 1$

Method 1: ac Method

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

$a = 3 \quad b = 7 \quad c = 2$

1st Identify a, b, c

$ac = 3 \cdot 2 = 6$

2nd Find ac and factors of ac that add to b

6	7
→ 1, 6	7 ✓

3rd Rewrite my trinomial with middle term the sum of two terms

$$3x^2 + 1x + 6x + 2$$

4th Factor by Grouping

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

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

Method 2: Guess and Check

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

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

$$3x \cdot x + 3x + 2x + 2$$

$$3x^2 + 5x + 2$$

$$\boxed{(3x + 1)(x + 2)}$$

$$3x^2 + \boxed{6x + x} + 2$$

$$3x^2 + \boxed{7x} + 2$$

Steps Guess & Check

1. Find pairs whose product is a place at the "First" of the binomials
2. Find pairs whose product is c place at the "Last" of the binomials
3. Use FOIL to check if Inner and outer added to b
4. If Not Repeat from top, changing positions or factors as Need

Method 3: Synthetic Factoring

$2p^2 + 5p - 12$

$a = 2$ $b = 5$ $c = -12$

-24	5
~~-1, 24~~	~~23~~
~~-2, 12~~	~~10~~
-3, 8	5
-4, 6	

$\frac{-3}{2}, \frac{8}{2}$

$\frac{-3}{2}, \frac{4}{1}$

$(2p - 3)(p + 4)$

1st going to find ac

2nd find factors of ac that add to b

3rd take each factor from step 2 divide by a, simplify the Resulting fractions

4th Write binomial factors by placing as coefficient of x and Numerator as constant in binomial