Objectives: *You learn how to completely factor polynomials in $x^2 + bx + c$ form.*

Factoring When Terms Have a Common Factor *(GCF factoring)*

Find what they have in common and use the reverse of the distributive property!!

Example 1: Factor the following.

a) $15x^2 + 15$

$15(x^2+1)$

Sep 23-4:17 PM

b) $24x^2 + 30x$

$6x(4x+5)$

Apr 28-10:05 AM

Factoring By Grouping

Group together pairs that have something in common, then use the reverse of the distributive property!!

4 terms!

Example 2: Factor $2x^3 + 10x^2 + x + 5$

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

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

Sep 23-4:19 PM

Example 3: Factor $ax + by + ay + bx$

$ax+ay+bx+by$

$a(x+y)+b(x+y)$

$(x+y)(a+b)$

Sep 23-4:19 PM

Example 4: Factor $7x^3 - 2x^2 - 7x^2 + 2x$

$x^2(7x-2)-x(7x-2)$

$(7x-2)(x^2-x)$

$x(7x-2)(x-1)$

Sep 23-4:20 PM

Factoring Trinomials $x^2 + bx + c$

Example 5: Factor $x^2 + 5x + 6$ ($a=1$)

Pairs of Factors of 6	That SUM to 5
1, 6	3, 2

Check by multiplying by FOIL!

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

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

Sep 23-4:20 PM

Example 6: Factor

a) $y^2 - 8y + 12$ $-6,-2$ $3,4$

$(y-6)(y-2)$ $1,12$

Sep 23-4:23 PM

b) $x^2 - 6x + 5$ $-1,-5$

$(x-1)(x-5)$

Apr 28-10:06 AM

Example 7: Factor

a) $x^2 + 3x - 4$ $4,-1$

$(x+4)(x-1)$

Sep 23-4:23 PM

b) $x^2 + 15x - 34$ $-2, 17$

$(x-2)(x+17)$

Mar 30-1:51 PM

Example 8: Factor

a) $x^2 - 6x - 7$ $-7, 1$

$(x-7)(x+1)$

Sep 23-4:25 PM

b) $t^2 - 24 + 5t$

→ First, rewrite in descending order

$t^2+5t-24$ $-3,8$

$(t-3)(t+8)$

Apr 28-10:08 AM

Factoring Trinomials $ax^2 + bx + c$: Using the AC Method

Example 9: $2x^2 - x - 1$

1. Multiply *a* & *c*

$a = 2$, $c = -1$, $ac = -2$

-2

2. Find 2 numbers that are factors of *ac* and add to *b*

must -2, adds to -1 $\quad -2, 1$

3. "Un-combine like terms" for your *b-term*

$2x^2 - x - 1$

$2x^2 - 2x + 1x - 1$

4. Use grouping to finish your factoring

$2x^2 - 2x + x - 1$

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

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

5. Check your answer: $(\quad)(\quad)$

$2x^2 + x - 2x - 1$

Feb 15-9:39 AM

Example 10: Factor

a) $3x^2 - 1x - 2$

$ac = -6$

$-3, 2$

$3x^2 - 3x + 2x - 2$

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

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

Sep 27-8:57 AM

b) $5x^2 + 22x + 8$

$ac = 40$

$20, 2$

$5x^2 + 20x + 2x + 8$

$5x(x+4) + 2(x+4)$

$(x+4)(5x+2)$

Sep 27-8:57 AM

Factoring Difference of Squares

Recall: $(x+2)(x-2) = x^2 - 2x + 2x - 4$

$x^2 - 4$

The product above is called a difference of squares because it is the subtraction of two perfect squares.

Sep 27-8:58 AM

Example 11: $x^2 - 16$

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

Sep 27-8:59 AM

Example 12: $x^2 - 49$

$(x+7)(x-7)$

Sep 27-9:00 AM

Example 13: $36 - x^2$

$(6+x)(6-x)$

Sep 27-9:00 AM

Feb 15-9:39 AM