2/8/2022

GCF + Factoring by Grouping (continued)

Recall: The GCF of a list of common variables raised to powers is the variable raised to the smallest exponent in the list.

WeBWork set: GCF Grouping

#2) $10x^5 + 35x^4$ (Factor)

Find the GCF

Factor: $10x^5 = 2 \cdot 5 \cdot x^5$

Factor: $35x^4 = 5 \cdot 7 \cdot x^4$

GCF: $5x^4$ Now use this to factor:

$$5x^4(2x + 7)$$

WW #5)

$$4x(y+8)-3(y+8)$$

GCF: $y+8$

factor →

$$4x(y+8)-3(y+8) = (y+8)(4x-3)$$

← multiply

WW #6) Factor

$$49AB+28A+14B+8$$

$$7^2AB+2^2\cdot 7A+2\cdot 7B+2^3$$

→ Try first to find a GCF for all terms appearing. In this case, there are no common terms for <u>all</u>.

Instead group terms together and factor the groups

$$(7^2AB + 2^2 \cdot 7A) + (2 \cdot 7B + 2^3)$$

$$7A(7B + 2^2) + 2(7B + 2^2)$$

$$= (7B + 2^2)(7A + 2)$$

Class Agenda 6

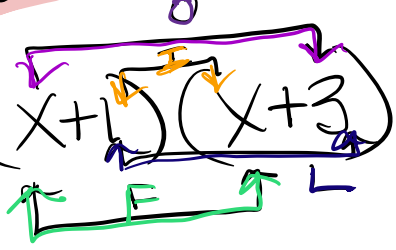
use what we learned to factor polynomials with 3 terms i.e. trinomials

Recall: Ex Factor

$$x^2 + 4x + 3 = (x+1)(x+3)$$

product

sum



"FOIL"

first, outer, inner, last

Now, what if the leading term has a coefficient other than 1?!

Ex $2x^2 + 11x + 12$

sum

product $2 \cdot 12 = 24$

product, multiply to 24 : 8, 3
and sum to 11 : 8, 3

Now what do we do with these numbers?! Swap out $11x$ for $8x + 3x$

$$2x^2+11x+12$$

$$=2x^2+8x+3x+12$$

Now factor by grouping!

$$=(2x^2+8x)+(3x+12)$$

$$=2x(x+4)+3(x+4)$$

$$=\boxed{(x+4)(2x+3)}$$

Recall: If our polynomial has 2 terms (i.e. is a binomial) and it looks like the difference of two perfect squares we have a formula for factoring:

$$\boxed{a^2-b^2=(a+b)(a-b)}$$

WW set difference of two squares

#1) $x^2 - 16$

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

Ex $36x^2 - 4y^2$

$= (6x)^2 - (2y)^2 = (6x+2y)(6x-2y)$

$49a^4 - 81b^{16}$

$= (7a^2)^2 - (9b^8)^2$

$= (7a^2 - 9b^8)(7a^2 + 9b^8)$