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# #5 Factoring $ax^2 + bx + c$

9/8/15

Factoring by grouping is the method Mrs. Underwood likes :)

Example  $ax^2 + bx + c$  Factoring by Grouping

A·C	B
-30	-13
-10, 3	-7
-3, 10	7
-15, 2	13

A)  $3x^2 - 13x - 10$

$$3x^2 - 15x + 2x - 10$$

$$(3x^2 - 15x) + (2x - 10)$$

$$3x(x - 5) + 2(x - 5)$$

$$(3x + 2)(x - 5)$$

GCF's      Repeated

① Find the Factors A·C that add = B

② Separate B term into the two factors you just found

③ Add Parenthesis Factor out GCF

④ GCF's are 1<sup>st</sup> Binomial Repeated Parenthesis are 2<sup>nd</sup> Binomial

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-20	8
-5, 4	
-2, 10	8

Ex2)  $4x^2 + 8x - 5$

$$(4x^2 - 2x) + (10x - 5)$$

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

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

$$ax^2 + Bx + C$$

11

①

Ex3)  $5x^2 + 7x - 6$

Don't forget to add x

$$\begin{array}{r|l} -30 & 7 \\ 10 & -3 \\ \hline & 7 \end{array}$$

$$(5x^2 - 3x) + (10x - 6)$$

$$x(5x - 3) + 2(5x - 3)$$

$$(x + 2)(5x - 3)$$

Ex4)  $2x^2 + 5x + 2$

$$\begin{array}{r|l} 4 & 5 \\ 4 & 1 \\ \hline & 5 \end{array}$$

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

Set each parentheses equal to zero

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

Solutions  
x-intercepts  
zeros  
roots

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

GCF's Repeat

Ex5)  $x^2 - 2x - 24$

$$\begin{array}{r|l} -24 & -2 \\ -8 & 3 \\ -4 & 6 \\ \hline -6 & 4 \\ & -2 \end{array}$$

$$(x^2 - 6x) + (4x - 24)$$

$$x(x - 6) + 4(x - 6)$$

$$(x + 4)(x - 6)$$