Module 5: Factoring Introduction

"Ask yourself if what you are doing today

is getting you closer to where you want to be tomorrow"

5.1 GCF and Factoring by Grouping

Largest number and the most variables that you can divide out of each term is called the _____.

Steps to find the GCF:

1. Find the prime factorization of the terms.
2. Find the common factors in each of the terms.
3. Multiply the most the common factors together.

Ex. Find the GCF of: 45 60 75

Ex. Find the GCF of: $20\ x^5\ y^6$ $150\ x^7\ y^3$

Ex. Find the GCF of: $42\ a^3\ b^2$ $63\ a\ b^5$ $21\ a^5\ b^4$

Applying GCF

Simplify $3x (2x + 5)$

Now factor using GCF to return to the original problem

_____ is the opposite of the distributive property.

You can always check a factoring problem by _____.

Ex. Factor: $10 a^2 b^4 + 15 a^3 b^2$

Ex. Factor: $3 x^5 y^{10} - 9 x^7 y^4 + 21 x^2 y^{12}$

Ex. Factor: $65 y^9 v^{18} + 20 y^{30} v^{20} + 30 y^{18} v^4$

At the start of any factoring problem, always look for _____.

Factoring by grouping is the same as factoring with _____,

except that we are factoring out a group of terms.

Ex. Factor: $3(x+2) - x(x+2)$

Steps to factoring by grouping:

1. Group the first and the last _____ terms together,
2. Pull out the _____ from each group.
3. Now pull out the common _____ (should match).

Note: When there is ____ terms, try factoring by grouping.

Ex. Factor: $-2y^3 - 6y^2 - 3y^2 - 9y$

Ex. Factor: $x^3 + 9x^2 + 10x + 90$

Ex. Factor: $10k + 10m - km - m^2$

Homework Checklist

- ☐ *Section 5.1 Factor GCF and Factoring by Grouping*

5.2 Factoring Trinomials (Leading Coefficient is 1)

Ex. Multiply (using F.O.I.L.): $(x - 2) (x + 5)$

Factoring trinomials is the _____ of F.O.I.L.

Steps to factoring trinomials:

1. Find the prime factorization for the _____ term.
2. Looking for 2 numbers that _____ to the last term.
3. Same 2 numbers should _____ to the middle term.

Ex. Factor: $x^2 + 3x - 10$

To get the leading term of x^2, each first term will be x.

So we start with:

( ) ( )

_____ of the last terms must be -10. What are the options?

_____ and _____

_____ and _____

_____ and _____

_____ and _____

Which of these options adds to the middle term of +3?

_____ and _____

Plug in the combination into each set of parentheses.

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The order in which you fill in your parentheses does not matter.

Remember to always check your answers by multiplying (F.O.I.L.)

Ex. Factor: $x^2 - 2x - 24$

Always start a problem by looking for the _____ first.

Ex. Factor: $2x^3 + 14x^2 + 20x$

Must factor out the _____ if the leading coefficient is negative.

Ex. Factor: $- x^2 + 14x - 45$

Homework Checklist

- ☐ *Section 5.2 Factoring Trinomials (Leading Coefficient is 1)*