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MFM 2PI

Unit #4 - Algebraic Expressions

Lesson #6 - Review

Multiply Two Binomials

Multiply everything in the first bracket by everything in the second bracket.

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

$$= 10x^2 + 15x - 12x - 18$$

$$= 10x^2 + 3x - 18$$

Common Factoring

Look for the greatest common factor (GCF) that divides evenly into all the terms.

$$6x + 3x^2 - 9x^3$$

$$= 3x\left(\frac{6x}{3x} + \frac{3x^2}{3x} - \frac{9x^3}{3x}\right)$$

$$= 3x(2 + x - 3x^2)$$

$6x \to 1, 2, \textcircled{3}, 6$
$\to \textcircled{x}$

$3x^2 \to 1, \textcircled{3}$
$\to \textcircled{x}, x^2$

$9x^3 \to 1, \textcircled{3}, 9$
$\to \textcircled{x}, x^2, x^3$

$$\frac{9x \cdot x \cdot x}{3x}$$

$$3x^2$$

Factoring Trinomials
Simple trinomials are of the form $x^2 + bx + c$. Determine the two numbers that multiply to make c and add to make b.

a) $x^2 - 7x + 10$

$= (x-5)(x-2)$

b) $x^2 + 13x - 30$

$= (x+15)(x-2)$

Factoring Difference of Squares
Difference of squares are of the form $x^2 - y^2$. They factor to $(x+y)(x-y)$.

a) $x^2 - 16$

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

b) $25x^2 - 4$

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

c) $64 - y^2$

$= (8-y)(8+y)$

d) $100x^2 - 121y^2$

$= (10x + 11y)(10x - 11y)$

COMBINING IT ALL TOGETHER
Always try to common factor first.

Then look to simple trinomial factor or factor as a difference of squares.
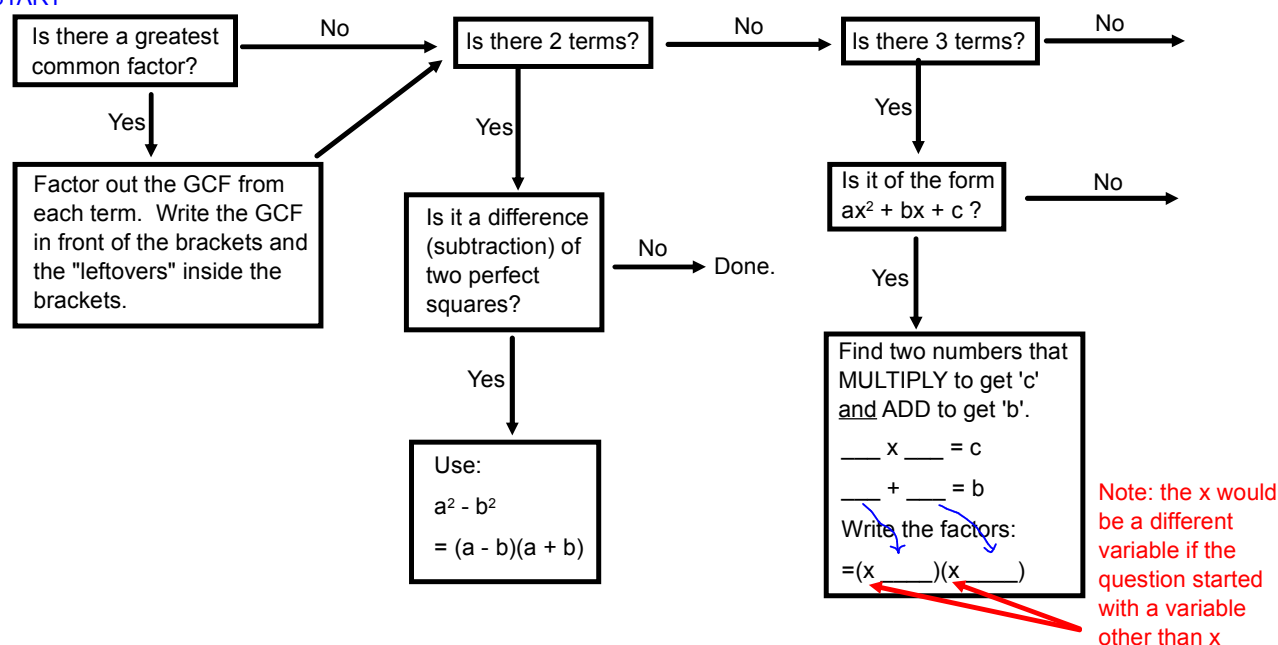
a) $7x^2 - 14x - 21$

$= 7(x^2 - 2x - 3)$

$= 7(x-3)(x+1)$

b) $3x^2 - 75$

$= 3(x^2 - 25)$

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

Factoring Flow Chart (2P)

START

Is there a greatest common factor? — No → Is there 2 terms? — No → Is there 3 terms? — No →

Yes ↓ (from "Is there a greatest common factor?")

Factor out the GCF from each term. Write the GCF in front of the brackets and the "leftovers" inside the brackets.

Yes ↓ (from "Is there 2 terms?")

Is it a difference (subtraction) of two perfect squares? — No → Done.

Yes ↓ (from "Is there 3 terms?")

Is it of the form $ax^2 + bx + c$? — No →

Yes ↓ (from "Is it a difference of two perfect squares?")

Use:

$a^2 - b^2$

$= (a - b)(a + b)$

Yes ↓ (from "Is it of the form $ax^2 + bx + c$?")

Find two numbers that MULTIPLY to get 'c' <u>and</u> ADD to get 'b'.

___ x ___ = c

___ + ___ = b

Write the factors:

$=(x$ ___ $)(x$ ___ $)$

Note: the x would be a different variable if the question started with a variable other than x

Homework:

Page 312 # 2 - 7, 10,
11, 12, 15,16

+ Practice Test

"Factoring"

If 2 terms

If 3 terms

Can I common factor first?

yes   no

common factor

difference of squares
$a^2 - b^2 = (a + b)(a - b)$

difference of squares

Can I common factor first?

yes   no

common factor

trinomial factor
$x^2 + 5x + 6$

trinomial factor