

What's Going On?

Checking In

Homework Logs

Minds on

This is how we factor

Action!

Factoring Sort

Consolidation

So much practice!

Learning Goal - I will factor!

Checking In

F.F.M.

Get your little books.

Factor

$$\overset{\text{F}}{4}x^2 - \overset{\text{OI}}{5}xy - \overset{\text{L}}{6}y^2.$$

Find two numbers that multiply to -24 and add to -5.

~~1, 24~~

~~2, 12~~

3, 8

~~4, 6~~

+ -

bigger # is \ominus

+3, -8

break up the middle term using these #s

$$= 4x^2 + 3xy - 8xy - 6y^2$$

Factor by grouping

$$= 4x^2 - 8xy + 3xy - 6y^2$$

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

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

$$= (\underline{4}x + \underline{3}y)(\underline{1}x - \underline{2}y)$$

Minds on

This is how we factor

Factor.

$$4x^3 - 6x^2 + 2x$$

① Common Factor

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

2 numbers that multiply to $(2)(1)=2$
add to -3

$$= 2x(\underline{2x^2} - x - \underline{2x} + 1)$$

$$= 2x(2x(x-1) - 1(x-1))$$

$$= 2x(2x-1)(x-1)$$

$$= 2x(\underline{1}x - \underline{1})(\underline{2}x - \underline{1})$$

Minds on

This is how we factor

Factor.

$$\begin{aligned}
 & \underbrace{7x^2(x+1)} - \underbrace{x(x+1)} + \underbrace{6(x+1)} \\
 &= (x+1)(7x^2 - x + 6) \quad \begin{array}{l} \text{both } \ominus \\ \text{or both } \oplus \end{array} \\
 & \quad \underline{-6}x - \underline{-7} = 42 \\
 & \quad \underline{-6} + \underline{-7} \neq -1
 \end{aligned}$$

Minds on

This is how we factor

Factor.

$$5x(2-x) + 4x(2x-5) - (3x-4)$$

Expand first

$$= 10x - 5x^2 + 8x^2 - 20x - 3x + 4$$

$$= 3x^2 - 13x + 4$$

two numbers that \otimes to $(3)(4)=12$
 \oplus to -13

$$= 3x^2 - x - 12x + 4$$

$$(-1) \text{ and } -12$$

$$= x(3x-1) - 4(3x-1)$$

$$= (x-4)(3x-1)$$

Minds on

This is how we factor

Factor.

$$4t(t^2 + 4t + 2) - 2t(3t^2 - 6t + 17)$$

① Expand

$$= 4t^3 + 16t^2 + 8t - 6t^3 + 12t^2 - 34t$$

② Contract (collect like terms)

$$= -2t^3 + 28t^2 - 26t$$

③ Common Factor

$$= -2t(t^2 - 14t + 13)$$

④ Factor the simple trinomial.

$$= -2t(t-1)(t-13)$$

Action!

Factoring Sort

Common Factor

- each term has a coefficient and/or a variable term in common

Grouping

- dealing with four terms
- also a middle step in decomposition

Simple Trinomial

- $ax^2 + bx + c$, when $a = 1$
- find two numbers that multiply to c and add to b

Complex Trinomial

- $ax^2 + bx + c$, when $a \neq 1$
- find two numbers that multiply to $(a)(c)$ and add to b
 then break up the middle term (decomposition)
 then factor by grouping

Difference of Squares

- just two terms separated by a negative sign (difference)!
- both terms are **perfect squares** (of squares)
- take the square root of each term, or use decomposition... first find two numbers that multiply to $(a)(c)$ and add to ZERO!

Perfect Square Trinomial

- $ax^2 + bx + c$, where ax^2 and c are perfect squares!
- b is actually just $2(\sqrt{ax^2})(\sqrt{c})$...think of the middle step of FOIL

Consolidation

So Much Practice

Consolidation

Homework!

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