What's Going On?

Checking In	Homework Logs
Minds on	Round and Round We Go
Action!	Factoring
Consolidation	This is how we factor.

Learning Goal - I will remember how to factor all of the polynomials I could factor in Grade 10.

Checking In

F.F.M.

Get your little books.

Expand.

Sophie is a female student.

$$(x + 4)^2(x - 1)$$

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

$= (x^2+8x+16)(x-1)$

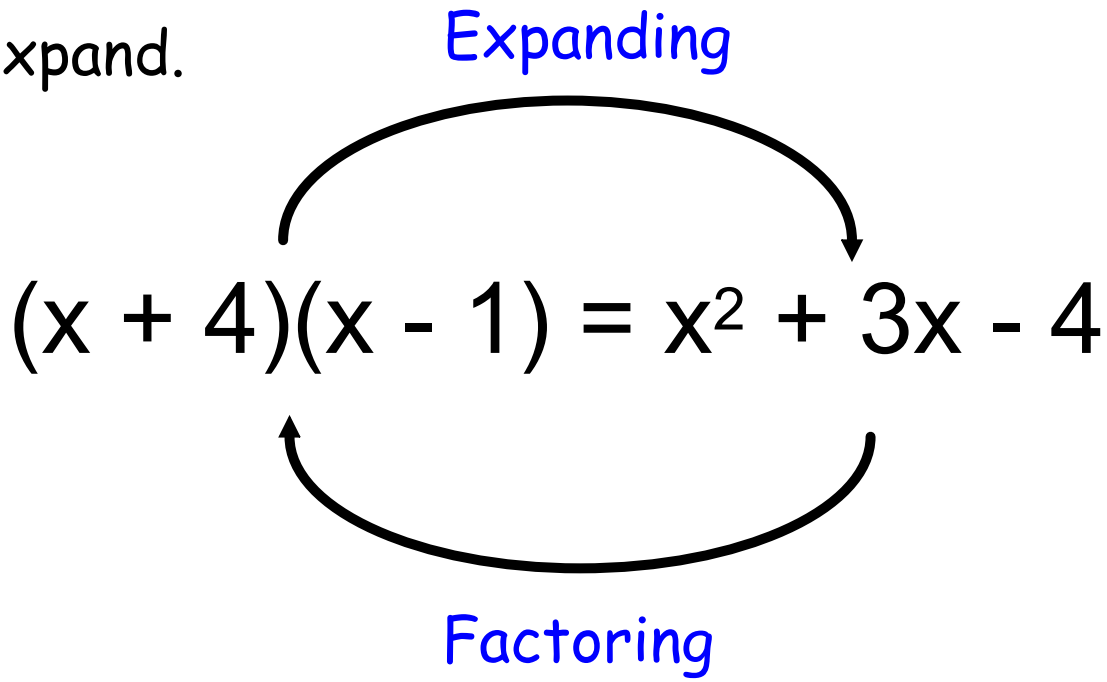
$= x^3+8x^2+16x-x^2-8x-16$

$= x^3+7x^2+8x-16$

Minds on

Round and Round We Go

Expand.



Action!

Factoring

Factor.

$$\frac{8x^3}{2x^2} - \frac{6x^2y^2}{2x^2} + \frac{4x^2y}{2x^2}$$

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

Monomial Common Factor

To factor any polynomial:

1. Find the greatest common factor (GCF) of the coefficients.

2. Find the GCF of the variable factors.

3. "Factor out" the monomial common factor.

4. Possibly, keep factoring!

Factoring

Action!

Factor.

$2x(z + 1) + 3y(z + 1)$

$(z+1)(2x+3y)$

Binomial Common Factor

To binomial common factor:

1. Identify the binomial common factor.

2. Combine the two other terms into a second binomial.

3. Bracket them,.

Action!

Factoring

Factor.

$2m^2 - 3t - 6m + mt$

$= \frac{2m^2}{2m} - \frac{6m}{2m} - 3t + mt$

$= 2m(m-3) + t(-3+m)$

$= 2m(m-3) + t(m-3)$

$= (m-3)(2m+t)$

Factoring by Grouping

To factor by grouping:

1. Group terms that have acommon factor.

2. Common Monomial Factor each pair of terms.

3. Look for a Binomial Common Factor and factor the polynomial as outlined on the previous slide.

Action!

Factor It!

$x^2 + 9x + 20$

positive

Find two numbers that add to give 9 and multiply to give 20.

↳ 4 & 5

$(x+4)(x+5)$

$y^2 + 1y - 6$

+ & −

Find two numbers that add to give 1 and multiply to give -6.

3 & −2

$(y+3)(y-2)$

$z^2 - 6z + 9$

negative!

Find two numbers that add to give -6 and multiply to give 9.

−3 & −3

$(z-3)(z-3)$

$(z-3)^2$

"perfect square trinomial"

Action!

Factor It!

$z^2 - 3z - 10$

+ + −

Find two numbers that add to give -3 and multiply to give -10.

"bigger is −"

$2 + -5$

$(z + 2)(z - 5)$

Simple Quadratics

To factor polynomials in the form $ax^2 + bx + c$ when $a = 1$:

1. Find two numbers that multiply to c and add to b.

2. These are your factors.

3. Put them in two sets of brackets as shown.

Action!

Factor It!

a b c

$6x^2 + 13x - 5$

Find two numbers that

multiply to (6)(-5) = -30

and add to +13.

+ + −

bigger (+)

$-2 \quad +15$

$= 6x^2 - 2x + 15x - 5$

$= 2x(3x-1) + 5(3x-1)$

now binomial common factor

$= (3x-1)(2x+5)$

Non-Simple Quadratics (Decomposition)

To factor polynomials in the form $ax^2 + bx + c$ whan $a \neq 1$:

1. Find two numbers that add to b and multiply to (a)(c). (Is this new?)

2. Break up the middle term.

3. Factor by grouping.

Action!

Factor It!

Difference of Squares!

$\sqrt{x^2} - \sqrt{4}$

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

$\sqrt{9x^2} - \sqrt{16}$

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

$\sqrt{100p^2} - \sqrt{121q^2}$

$= (10p+11q)(10p-11q)$

$\sqrt{g^4} - \sqrt{16}$

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

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

Action!

Factor It!

Perfect Square Trinomials

$(2x)(5)2$

$\sqrt{4x^2} + 20x + \sqrt{25}$

$2x \quad 5$

"I need two numbers that multiply to $(4)(25) = 100$ and add to 20

$10 + 10$

$= 4x^2 + 10x + 10x + 25$

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

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

$= (2x+5)^2$

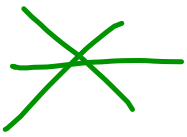
$(3x)(4)(2)$

$\sqrt{9x^2} - 24x + \sqrt{16}$

$(3x - 4)^2$

Consolidation

This is how we factor

Always common factor first! 

*You may need to expand before you can factor... paradoxical?

Consolidation

This is how we factor

Factor.

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

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

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

Consolidation

This is how we factor

Factor.

$$7x^2(x + 1) - x(x + 1) + 6(x + 1)$$

Consolidation

This is how we factor

Factor.

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

Consolidation

This is how we factor

Factor.

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

Consolidation

Homework!

Pg. 102: 1 - 9

"some" *

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