

What's Going On?

Checking In

Reviewing like terms

Minds on

"Flipping" polynomials

Action!

Adding and Subtracting

Consolidation

Partner up!

Learning Goal - I will be able to add and subtract polynomials!

Review

Group like terms and simplify.

$$\boxed{y} + \boxed{3} + \boxed{10} - \boxed{4y} = -3y + 7$$

$$\boxed{4qr} + \boxed{5r^2} - \boxed{qr} + \underline{6r} + \boxed{18r^2} - \underline{3r}$$

$$3qr + 18r^2 + 3r$$

A student in grade 9 wrote:

$$\boxed{3x} + 4 \boxed{+6x} = 13x.$$

What's the mistake?

Minds on

The Polynomial Factory

Input	Output
$7x$	$-7x$
-0.5	0.5
x^2y	$-x^2y$

What's the glitch with our machine?

Minds on

The Polynomial Factory

Input	Output
$-x^2 + 3$	$+x^2 - 3$
$7xy^2 + 8$	$-7xy^2 - 8$
$3x^2 - x + 8$	$-3x^2 + x - 8$

It's changing the positive signs to negative signs and the negative signs to positive signs!

 Minds on

The Polynomial Factory

"Flipping" a polynomial, or creating its opposite, means changing the signs of each term.

Original version: $x^2 - 7yx + 3y^3 - 8$

Flipped version: $-x^2 + 7yx - 3y^3 + 8$

Action!

Addition and BEDMAS

Compare:

$$\begin{array}{c}
 4 + 2 \\
 \text{~~~~~} \\
 6 \swarrow \quad \searrow \\
 \text{O} \\
 5 + 2 + 6 - 7
 \end{array}$$

$$\begin{array}{c}
 (4) + (2) \\
 \text{~~~~~} \quad \text{~~~~~} \quad \nearrow 6 \\
 \text{O} \\
 (5 + 2) + (6 - 7)
 \end{array}$$

$$\begin{array}{c}
 4 + 3 - 5 + 6 - 2 + 8 \\
 14
 \end{array}$$

$$\begin{array}{c}
 \cancel{(4 + 3 - 5)} + \cancel{(6 - 2 + 8)} \\
 (2) + (12)
 \end{array}$$

Action!

Addition and BEDMAS

Brackets make you do things in a certain order. Does the order matter when you're adding?

$$\begin{aligned} & (6r - 2) + (2r - 8) \\ &= 6r + 2r - 2 - 8 \\ &= 8r - 10 \end{aligned}$$

Action!

Adding Polynomials

Easy!

1. Drop the brackets
2. Collect like terms
3. Simplify

Action!

Adding Polynomials

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

1. Drop the brackets

$$x^2 - 3x + 5 + x^2 + 5x - 3$$

2. Collect like terms

$$x^2 + x^2 + 5x - 3x - 3 + 5$$

3. Simplify

$$2x^2 + 2x + 2$$

Action!

Subtracting Polynomials

Hard?

Nah. Subtracting is the opposite of adding. To subtract a polynomial, add its opposite (flipped version)!

1. "Flip" the polynomial that you are subtracting (change it to its opposite).

→ change the signs of each term

2. Add the polynomials!

Action!

Adding and Subtracting Polynomials

Subtracting Polynomials

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

1. Change the polynomial to be subtracted to its opposite

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

Adding
Polynomials

2. Drop the brackets

3. Collect like terms

4. Simplify

Action!

Adding and Subtracting Polynomials

Subtracting Polynomials

1. Change the polynomial to be subtracted to its opposite

Why?

2. Add the polynomials!

$$(3) - (5) \longrightarrow 3 + (-5)$$

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

$$(6x) - (3x) = (6x) + (-3x)$$

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

Consolidation

Partner up and simplify

$$\text{a) } (3x + 5) + (8x - 3) = \underline{3x} + \underline{5} + \underline{8x} - \underline{3} \\ = 11x + 2$$

$$\text{b) } (3x + 5) - (8x - 3) = \underline{3x + 5} + \underline{-8x + 3} \\ = 3x - 8x + 5 + 3 \\ = -5x + 8$$

$$\text{c) } (6x^2 + 3x - 3) + (7x^2 - 3x + 8) = \underline{6x^2} + 3x - 3 \underline{+ 7x^2} - 3x + 8 \\ = 6x^2 + 7x^2 + 3x - 3x - 3 + 8 \\ = 13x^2 + 0x + 5 \\ = 13x^2 + 5$$

$$\text{d) } (6x^2 + 3x - 3) - (7x^2 - 3x + 8)$$

$$\text{e) } (4a^2 + 2a + 3) + (3a^2 - 4a - 4) - (5a^2 + 3a - 6)$$