

Adding and Subtracting Polynomials

What is a polynomial?

A polynomial is an algebraic expression consisting of one term or a sum of terms:

Ex: $3x^4 + 3x^2$ is a polynomial with two terms.

Ex: $7x^3 + 4x + 9$ is a polynomial with _____ terms.

Example 1:

$$(4x^2 + x + 7) + (2x^2 + 3x - 2)$$

Since we are **adding** these polynomials, we **DO NOT** need the parenthesis

$$4x^2 + x + 7 + 2x^2 + 3x - 2 \quad \text{Combine like terms.}$$

$$= 6x^2 + 4x + 5$$

Example 2:

$$(4x^2 + x + 7) - (2x^2 + 3x - 2)$$

Since we are **subtracting** these polynomials, we need to **DISTRIBUTE** the negative.

$$(4x^2 + x + 7) - (2x^2 + 3x - 2)$$

$$= 4x^2 + x + 7 - 2x^2 - 3x + 2$$

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Example 3:

a.) $(7x^2 - 2x + 7) + (8x^3 + 9x)$

b.) $(4x^2 + 3x - 1) + (3x^2 + 4x + 9) - (x^2 - x + 4)$

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Practice Problems

Simplify each expression:

1. $2x^5 - 4x^4 + 5x^5 + 2x$

2. $(4w^3 - 4w^2 - 4) + (6w^3 + 5w^2 - 8)$

3. $(4w^3 - 4w^2 - 4) - (6w^3 + 5w^2 - 8)$

4. $12x^2 + 4x - 2 - 3x^2 + 4x + 9$