



Adding and Subtracting Polynomials

Unit 8 Lesson 2

Adding and Subtracting Polynomials

Students will be able to:

Add and subtract algebraic expression and simplify polynomials with grouping symbol.

Key Vocabulary:

- addition
- subtraction
- Parenthesis
- Bracket
- Braces



Adding and Subtracting Polynomials

Rules in Addition and Subtraction of Polynomials:

Rule 1: To add two or more monomial with the same literal coefficient, add only their numerical coefficient and affix the literal coefficient.

Rule 2: To add two or more polynomials, add similar or like terms together.

Rule 3: To subtract polynomials, change the sign of the subtrahend and proceed as in addition.

Rule 4: to remove grouping and symbols such as parenthesis (), Brackets [] and braces{} preceded by a

(i) minus sign, change the sign of each terms;

(ii) plus sign, no further change is done;

(iii) factor, use distributive law.

Adding and Subtracting Polynomials

Sample Problem 1: find the sum of the following polynomials

1. $-8 + x^2$ and $x^2 - 1$

2. $3a^2b + 4a - 9$ and $7 + 2a^2b - 4a$

3. $2a - 3b + 4c$ and $-4a - 4c$

4. $1 - 6a$ and $5 - 4a + 3a^2$



Adding and Subtracting Polynomials

Sample Problem 1: find the sum of the following polynomials

1. $8 + x^2$ and $x^2 - 1$

$$\begin{array}{r} x^2 + 8 \\ (+) \quad x^2 - 1 \\ \hline 2x^2 + 7 \end{array}$$

2. $3a^2b + 4a - 9$ and $7 + 2a^2b - 4a$

$$\begin{array}{r} 3a^2b + 4a - 9 \\ (+) \quad 2a^2b - 4a + 7 \\ \hline 5a^2b \quad \quad - 2 \end{array}$$

3. $2a - 3b + 4c$ and $-4a - 4c$

$$\begin{array}{r} 2a - 3b + 4c \\ (+) -4a \quad \quad -4c \\ \hline -2a - 3b \end{array}$$

4. $1 - 6a$ and $5 - 4a + 3a^2$

$$\begin{array}{r} 3a^2 - 4a + 5 \\ (+) \quad \quad -6a + 1 \\ \hline 3a^2 - 10a + 6 \end{array}$$

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Sample Problem 2: Subtract the following polynomials

$$5.2a - 3b + 4c \quad \text{and} \quad -4a - 4c \qquad 6.3a^2b + 4a - 9 \quad \text{and} \quad 7 + 2a^2b - 4a$$

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Sample Problem 2: Subtract the following polynomials

$5. 2a - 3b + 4c \quad \text{and} \quad -4a - 4c$ $6. 3a^2b + 4a - 9 \quad \text{and} \quad 7 + 2a^2b - 4a$

$$\begin{array}{r} 2a - 3b + 4c \\ (-) - 4a \qquad - 4c \\ \hline 2a - 3b + 4c \\ (+) 4a \qquad + 4c \\ \hline 6a - 3b + 4c \end{array}$$

$$\begin{array}{r} 3a^2b + 4a - 9 \\ (-) 2a^2b - 4a + 7 \\ \hline 3a^2b + 4a - 9 \\ (+) - 2a^2b + 4a - 7 \\ \hline a^2b + 8a - 16 \end{array}$$

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Sample 3: Simplify the following polynomials, remove {}, [] and ().

$$7. -(2x - y + 10) + (4x - 3y) - 2(3x - 4y + 6)$$

$$8. 4x - 2y - 5 - 2(8x - 7y) - (3x - 4y - 1)$$

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Sample 3: Simplify the following polynomials, remove {}, [] and ().

$$7. -(2x - y + 10) + (4x - 3y) - 2(3x - 4y + 6)$$

$$-2x + y - 10 + 4x - 3y - 6x + 8y - 12$$

$$-4x + 6y - 22$$

$$8. 4x - 2y - 5 - 2(8x - 7y) - (3x - 4y - 1)$$

$$4x - 2y - 5 - 16x + 14y - 3x + 4y + 1$$

$$-15x + 16y - 4$$

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Sample 4: Solve the following

9. Subtract $4x + 3y + 5$ from the sum of $-3x - y + 5$ and $x + 8y - 3$.
10. Subtract the sum of $2x - 3y - 8z$ and $-3x + 5y - 11z$ from the sum of $-12x - 5y - 9z$ and $-8x + 2y + 12z$.

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Sample 4: Solve the following

9. Subtract $4x + 3y + 5$ from the sum of $-3x - y + 5$ and $x + 8y - 3$.

$$(-3x - y + 5) + (x + 8y - 3)$$

$$-2x + 7y + 2$$

$$-2x + 7y + 2 - (4x + 3y + 5)$$

$$-2x + 7y + 2 - 4x - 3y - 5$$

$$-6x + 4y - 3$$

10. Subtract the sum of $2x - 3y - 8z$ and $-3x + 5y - 11z$ from the sum of $-12x - 5y - 9z$ and $-8x + 2y + 12z$.

$$(-12x - 5y - 9z) + (-8x + 2y + 12z)$$

$$-20x - 3y + 3z$$

$$(2x - 3y - 8z) + (-3x + 5y - 11z)$$

$$-x + 2y - 19z$$

$$(-20x - 3y + 3z) - (-x + 2y - 19z)$$

$$-20x - 3y + 3z + x - 2y + 19z$$

$$-19x - 5y + 22z$$