ALMS8

TAILORED LEARNING, PERSONALIZED PROGRESS

# SUPPLEMENTARY MODULE 4

## Add and Subtract Simple Monomials

## GRADE 8

malms8.online

# 3 ADD AND SUBTRACT SIMPLE MONOMIALS

**Hello, incredible learners! We know that mastering new concepts can sometimes feel like navigating through uncharted territory, and that's okay! If you're feeling a bit uncertain about adding and subtracting monomials, you're not alone. In this supplementary session, we're here to provide you with the extra support and encouragement you need to conquer these mathematical challenges. Remember, it's all about progress, not perfection! You've got this!**

**Learning Objectives**

At the end of this lesson students will be able:

1. identify common errors and misconceptions in adding and subtracting monomials;
2. solve word problems focus on adding and subtracting monomials; and
3. recognize the significance of understanding how to add and subtract monomials in tackling practical problems.

**Let's review the correct and general process for adding and subtracting monomial.**

Monomials are expressions in algebra that include only one term. Monomial addition and subtraction entail grouping like terms together to simplify expressions. Let's investigate this procedure.

| | Addition of Monomials | Subtraction of Monomials |
|---|---|---|
| **Given** | $-ef^2 + 30e^2 + 13ef^2$ | $-2a^2b^7 - 14ab^7 - (-36a^2b^7) - 10a^2b$ |
| **1. Identify like terms (terms with the same variable and exponent).** | **Like terms:** $-ef^2, 13ef^2$ | **Like terms:** $-2a^2b^7, (-36a^2b^7)$ |
| **2. Add/Subtract the coefficients of like terms.** | $-1 + 13$<br>$= 12$ | $-2 - (-36)$<br>$= -2 + 36$<br>$= 34$ |
| **3. Keep the variable and exponent unchanged.** | $12ef^2$ | $34a^2b^7$ |
| **4. Copy and write the unlike terms after simplifying the like terms** | $12ef^2 + 30e^2$ | $34a^2b^7 - 14ab^7 - 10a^2b$ |

**Note that:** $x^2$ can be written as x^2. The symbol, "^", represents that the number is being raised to a certain power.

**Common Errors and Misconceptions**

**A. Incorrectly Combining Unlike Terms**

**Mistake:** Adding or subtracting terms that are not like terms.
**Example:**
**Given:** 3x^2 + 4x - 2y + 5x^3

**Incorrect Solution:**
= 3x^2 + 5x^3 + 4x - 2y
= 8x^3 + 4x - 2y

**Mistake Explanation:** Adding the terms 3x^2 and 5x^3 is incorrect because they are not like terms. The variable 'x' has different exponents (2 and 3, respectively), so they cannot be combined. Hence, the process in which the two coefficients were added and copied the highest exponent of x is wrong.

**B. Forgetting to Combine Coefficients**

**Mistake:** Not adding or subtracting the coefficients of like terms correctly.

**Example:**

**Given:** 2x^2 + 3x + 5x^2 + 2x

Incorrect Solution:
= 2x^2 + 5x^2 + 3x + 2x
= 7x^2 + 3x (Incorrectly added coefficients)


**Mistake Explanation:** The correct result should be 7x^2+5x. Forgetting to combine coefficients properly can lead to incorrect outcomes.

**C. Misinterpreting Signs:**

**Mistake**: Misinterpreting the signs when combining terms.

**Example:**

**Given:** 4x^2 - 2x - 3x^2 + 6x

**Incorrect Solution:**

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

= 7x^2 -4x (Incorrect sign in front of the second term)

**Mistake Explanation:** In this case, -2x +6x should result in 4x not -4x.

**D. Not Recognizing Constants as Like Terms**

**Mistake:** Ignoring constants as like terms.

**Example:**
**Given:** 3x + 2 - 5x - 1

Incorrect Solution:

= 3x - 5x + 2 - 1

= -2x + 2-1 (Ignoring constants as like terms)

**Mistake Explanation:** Constants are also like terms. In this case, 2 and -1 should be combined to get +1, resulting in -2x + 1, not -2x+2-1.

**Solving world problems involving Monomials**

Monomials are algebraic expressions with only one term. They often appear in various contexts, and understanding how to manipulate them is crucial for problem-solving.

| | |
|---|---|
| **Scenario 1: Gardening**<br><br>Jamie is managing a garden where she grows flowers and vegetables. She started with 5 rose bushes and 3 tomato plants. Later, she bought 2 more rose bushes and planted 4 more tomato plants. How many plants does Jamie have in her garden now? |  |

1. ***Identify Monomials:***
    - Initial number of rose bushes: 5 (monomial)
    - Initial number of tomato plants: 3 (monomial)
    - Additional rose bushes: 2 (monomial)
    - Additional tomato plants: 4 (monomial)

    ***Apply Operations:***

    *Combine only the like terms, in this case, the same plant:*

    - Total number of rose bushes: 5 + 2 = 7
    - Total number of tomato plants: 3 + 4 = 7

    ***Analyze and simplify:***

    - Jamie now has 7 rose bushes and 7 tomato plants in her garden.

| | |
|---|---|
| **Scenario 2: Bookshelf Shuffle**<br><br>Samantha is organizing her bookshelf. She currently has 10 fiction books and 5 non-fiction books. If she decides to give away 3 fiction books and receives 2 more non-fiction books as gifts, how many books does Samantha have on her bookshelf now? |  |

1. ***Identify Monomials:***
    - Initial number of fiction books: 10 (monomial)
    - Initial number of non-fiction books: 5 (monomial)
    - Fiction books given away: 3 (monomial)

Non-fiction books received as gifts: 2 (monomial)

2. ***Apply Operations:***

    Combine only the like terms, in this case, the same type of book:
    - Total number of fiction books after giving away: 10 - 3 = 7
    - Total number of non-fiction books after receiving gifts: 5 + 2 = 7
3. ***Analyze and Simplify:***
    - Samantha now has 7 fiction books and 7 non-fiction books on her bookshelf.

## REMEMBER....

When adding and subtracting monomials, it's crucial to pay attention to the like terms, which are terms with the same variables raised to the same powers. Combine like terms by adding or subtracting their coefficients. Remember to keep the variables and their exponents unchanged when simplifying expressions involving monomials.