Common Terms

In linear equations, common terms are the same variables or constants that appear on both sides of the equation.

To simplify the equation, we can eliminate common terms from both sides by adding or subtracting them.

Why Remove Common Terms?

Removing or simplifying common terms:

- Makes the equation easier to solve.
- Reduces the number of steps in solving.
- Helps in balancing the equation correctly.

Properties of Common Terms in Equations

1. Same values on both sides can be canceled.

For example:

x + 3 = x + 5

The x appears on both sides. Subtracting x from both sides gives:

 $3 = 5 \rightarrow \text{No solution}$ (contradiction).

2. Subtracting the same variable term from both sides keeps the equation balanced.

For example:

2x + 4 = x + 7

Subtracting x from both sides gives:

x + 4 = 7

3. The principle of equality allows us to add or subtract the same quantity from both sides of an equation.

Example 1

Solve:

2x + 3 = x + 7

Solution:

Step 1: Remove the common term x from both sides.

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

x + 3 = 7

Step 2: Subtract 3 from both sides.

x = 4

Answer: x = 4

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Example 2

Solve:

3x + 6 = 5x - 2

Solution:

Step 1: Remove the common variable term. Subtract 3x from both sides.

$$3x - 3x + 6 = 5x - 3x - 2$$

$$6 = 2x - 2$$

Step 2: Add 2 to both sides.

$$6 + 2 = 2x$$

$$8 = 2x$$

Step 3: Divide both sides by 2.

$$x = \frac{8}{2}$$

$$x = 4$$

Answer: x = 4

Key Points to Remember

- Always try to simplify both sides first.
- Look for like terms (same variable) on both sides.
- Subtract or add the common terms to make the equation easier.
- Always perform the same operation on both sides to maintain equality.