Algebraic Expressions on the Number Line

Understanding of Algebraic Expressions on the Number Line

- Algebraic expressions can be represented visually on a number line.
- It helps in understanding operations like addition and subtraction involving variables.
- We can treat variables like unknown numbers and move accordingly on the number line.
- Positive movements mean moving to the right and negative movements mean moving to the left.

Important Points

- Start from 0 or a given point on the number line.
- Addition of a positive number: move to the right.
- Subtraction of a positive number: move to the left.
- Expressions like x + a: move 'a' units right from 'x'.
- Expressions like x a: move 'a' units left from 'x'.

Examples with Solutions

Example: Representing a Simple Expression

≽ x + 3

Solution: Start at point x on the number line.

Move 3 units to the right.

New position represents x + 3.

Example: Representing a Subtraction Expression

➤ Expression: x – 4

Solution: Start at point x on the number line.

Move 4 units to the left.

New position represents x - 4.

Example: Expression with Negative Variable

≻ -x + 2

Solution: Start at point –x (opposite of x) on the number line.

Move 2 units to the right.

Final position represents -x + 2.

Example: Combination of Movements

Expression: x + 5 - 2

Solution: Start at x on the number line.

Move 5 units right (for +5).

Then move 2 units left (for -2).

The final position is x + 3.

Example: Expression with Fractions

> x + $\frac{3}{2}$

Solution: Start at x on the number line.

Move $\frac{3}{2}$ units (or 1.5 units) to the right.

New position represents $x + \frac{3}{2}$.

Summary Points

- Algebraic expressions can be understood better using number lines.
- Movement to the right shows addition while movement to the left shows subtraction.
- Helps in visualizing how variables behave with numbers.
- Useful for solving linear expressions and simple equations.
- Fractions can also be represented with careful movement on the number line.