PUBLIC SCHOOL DARBHANGA

SESSION 2020-21

MATHEMATICS

CLASS :VII

SIMPLE EQUATIONS

(HANDOUT)

Introduction to Simple Equations

Variables and Expressions

Variable is a quantity that can take any value, its value is **not fixed**. It is a symbol for a number whose value is unknown yet.

Expressions are formed by p rforming operations like **addition, subtraction, multiplication** and **division** on the variables.

Example: 6x – 3 is an expression in variable x.

Algebraic Equation

An **equation** is a **condition on a variable** such that two expressions in the variable should have **equal value**.

Example: 8x−8=16 is an equation.

The **value** of the **variable** in ɑn equation for which the **equation is satisfied** is called the **solution of the equation**.

Example: The solution for the equation 2x−3=5 is x=4.

More about Equations

Mathematical Operations on Expressions

- Addition of variables: (3x+4z)+(5y+6)
- Subtraction of variabl s: (4x−7y)−(6y+5)
- Multiplication of variables: (5xy+6)×7x
- Division of variables: 8xz+5z15x−6y

Solving an Equation

Solving an equation involve performing the **same operations** on the expressions on **either side** of the "=" sign so that the value of the variable is found **without dist urbing the balance**.
Example : Solve 2x+4=10
Consider 2x+4=10
⇒2x+4−4=10−4 [Subtractin 4 from both LHS and RHS] ⇒2x=6
⇒2x2=62 [Dividing both LHS and RHS by 2] ⇒x=3

Methods of Solving an Equation

Method 1: performing the **same operations** on the expressions on **either side** of the "=" sign so that the value of the variable is found **without disturbing the balance**.
Opertions involve **Adding, subtracting, multipling or dividing** on **both** sides.

Example: x+2=6
Subtract 2 from LHS and RHS
⇒ LHS: x+2−2=x
⇒ RHS: 6−2=4
But LHS = RHS
⇒ x = 4

Method 2: Transposing
It involves moving the terms to one side of the equation to find out the value of the variable. When terms move from one side to another they change their sign.
Example: x+2=6
Transpose (+2) from LHS to RHS
⇒x=6−2
⇒x=4

Applying Equations

Forming Equation from Solution

Given a solution, many equations can be constructed.

Example: Given solution: x = 3
Multiply both sides by 4,
⇒ 4x=4×3
Add -5 to both sides,
⇒ 4x−5=12−5
⇒ 4x−5=7
Similarly, more equations can be constructed.

Applications (Word problem)

Example: Ram’s father is 3 times as old as his son Ram. After 15 years, he will be twice the age of his son. Form an equation and solve it.
Solution: Let Ram’s age be x.
⇒ His father’s age is 3x.
After 15 years:
3x+15=2(x+15)
On solving,
3x+15=2x+30
3x−2x=30−15
x=15
∴ Ram’s age is 15 and his dad’s age is 45.