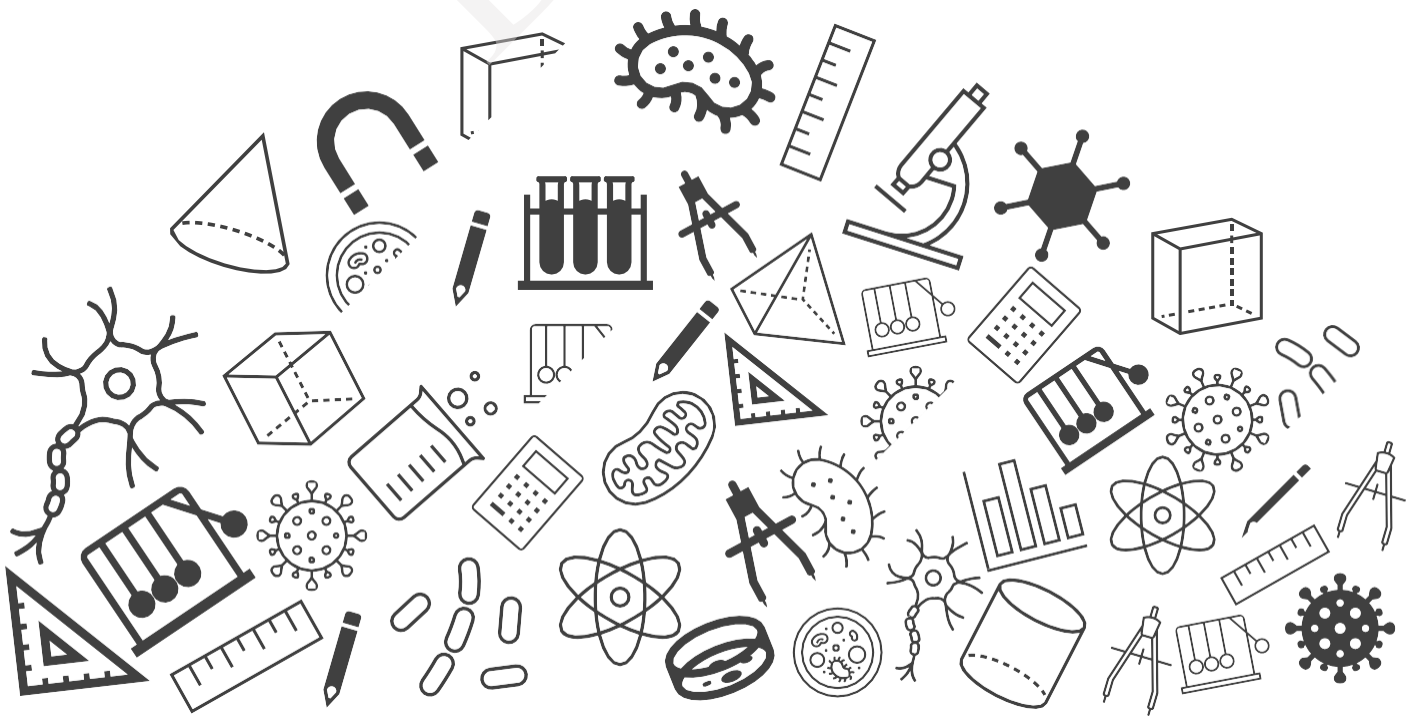
Grade 08
Maths Chapter Notes



BYJU'S Classes

Chapter Notes

Linear Equations in One Variable

Grade 08

Topics to be Covered

1. Linear Equations in one Variable
2. Solving Linear Equations in one variable
3. Equations Reducible to Simpler Form
   - 3.1. Using Balancing Method
   - 3.2. Using Transposition Method
4. Word Problems

1. Linear Equations in One Variable

An algebraic equation having only **one variable** and the **highest power** of the variable as **1** is known as a **linear equation in one variable.**

Some examples of linear equations in one variable are:

- $3x = 6$
- $9y - 1 = 2y$
- $\frac{1}{4}(2z - 1) = 3$

2. Solving Linear Equations in One Variable

2.1. Using Balancing Method

The **same operation is performed on both the sides of the equation** while using balancing method of solving a linear equation.

Example: $2x + 1 = 3$

- Subtracting 1 on both sides:

$\Rightarrow 2x + 1 - 1 = 3 - 1$

$\Rightarrow 2x = 2$

- Dividing both sides by 2:

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

$\Rightarrow x = 1$

2. Solving Linear Equations in One Variable

2.2. Using Transposition Method

An equation can be solved by transposition method using the following steps:

Step 1: Transpose all the variables to one side and all the constants to the other side of the equation.

Step 2: Simplify the expression and solve for the variable.

While applying transposition method the sign changes as per the following rule:

2. Solving Linear Equations in One Variable

2.2. Using Transposition Method

Examples related to solving linear equations using transposition method:

- **Variables on one side**

  $\mathbf{2x + 1 = 3}$

  Transposing 1 to the R.H.S.

  $\Rightarrow 2x = 3 - 1$

  $\Rightarrow 2x = 2$

  Transposing 2 to the R.H.S.

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

  $\Rightarrow x = 1$

- **Variables on both the sides**

  $\mathbf{4x - 2 = 2x}$

  Transposing $2x$ to the L.H.S.

  $\Rightarrow 4x - 2x - 2 = 0$

  Transposing 2 to the R.H.S

  $\Rightarrow 4x - 2x = 2$

  $\Rightarrow 2x = 2$

  Transposing 2 to the R.H.S.

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

  $\Rightarrow x = 1$

3. Reducing Equations to Simpler Form

Step 1: Simplify the equation.

Step 2: Bring variables to one side, and constants to the other side.

Step 3: Solve the equation.

Example:

$$3(t-3) = 5(2t+1)$$

$$\Rightarrow 3t - 9 = 10t + 5$$

$$\Rightarrow 3t - 10t = 5 + 9$$

$$\Rightarrow -7t = 14$$

$$\Rightarrow t = -2$$

Mind Map