CBSE Class 8 Maths Notes Chapter 2: Chapter 2 of CBSE Class 8 Maths, Linear Equations in One Variable, focuses on solving equations of the form ax+b=0, where x is the variable. The chapter teaches students how to isolate the variable using operations like addition, subtraction, multiplication, and division.

It also covers equations with variables on both sides, fractional and decimal coefficients, and negative values. Students are introduced to word problems, translating real-life situations into linear equations. The chapter emphasizes the transposition method, preparing students for more complex algebraic equations and real-world applications.

CBSE Class 8 Maths Notes Chapter 2 Overview

Chapter 2 of CBSE Class 8 Maths, titled Linear Equations in One Variable, introduces students to the concept of solving equations involving one variable. A linear equation in one variable is of the form ax+b=0, where a and b are real numbers, and xxx is the variable. The goal is to find the value of the variable that satisfies the equation.

The chapter starts by explaining the basic form of linear equations and gradually teaches students how to isolate the variable using various operations like addition, subtraction, multiplication, and division. It covers solving equations where the variable is present on one side as well as on both sides of the equation.

Additionally, students are introduced to word problems, where real-life scenarios are translated into linear equations. This helps in understanding the practical application of the concept. The chapter also covers how to handle equations that involve fractions, decimals, or negative values.

CBSE Class 8 Maths Notes Chapter 2 Linear Equations in One Variable

One variable makes up a linear equation in one variable, and the highest power of the variables employed in the equations is 1. This linear equation can have any rational number as its solution. Expressions that are linear on both sides of the equal to sign may be found in this equation.

We can transpose the variables from one side of the equation to the other, just like we can with integers. The process of simplifying equations created by expressions can be achieved by equating the expression by multiplication using appropriate approaches, so transforming the equation into a linear form. Applications of linear equations can be found in mathematics as well

as a variety of other contexts, including difficulties involving numbers, perimeter, ages, and currency.

Variables and Constants

A constant is a value or number that remains constant throughout an expression and never varies.
A variable is a letter that stands for an unidentified number. It can have any value; its value is not fixed. A constant, on the other hand, always has the same value.
For instance, in the phrase 4x+7, x is a variable and 4 and 7 are constants.

Algebraic Equation

An algebraic equation is the declaration of equality between two algebraic expressions. It takes the form P=Q, where P and Q are expressions in algebra.
There exist algebraic expressions for 6x + 5 and 5x + 3. We obtain an algebraic equation by equating the algebraic expressions.
This is an algebraic equation: 6x + 5 = 5x + 3.

Linear Equations in One Variable

An algebraic equation with a single variable whose maximum power is one and each term being either a constant or the product of a constant and a single variable is called a linear equation.
A linear equation is referred to as being in one variable if there is only one variable in it.
An example of a linear equation in one variable is 7x + 4 = 5x + 8.

Solving Linear Equations

Performing Mathematical Operations on Equations

Mathematical operations on a linear equation must be performed on both sides of the equality in order for the equality to hold.
Let's say that the equation 4x + 3 = 3x + 7 is linear. To ensure that the equality holds true, we must deduct 3 from the provided equation on both sides of it.
4x+3−3=3x+7−3
4x=3x+4
In a similar vein, to multiply or divide the equation, we simply multiply or divide by the specified number all of the terms that are on the left and right sides of the equivalence.
Note: the equation cannot be divided or multiplied by 0.

Solving Equations with Linear Expression on one side and numbers on the other side

Let's say we need to solve the equation 2x−3=7, where the numbers are on the right and the linear expression is on the left.
The first step is to translate every constant phrase from the left to the right.

2x=7+3=10⇒2x=10

Step 2: Divide both sides of the equation by the coefficient of the variable.
In the above equation 2x is on the left-hand side. The coefficient of 2x is 2.
On dividing the equation by two, We get:
(½) × (2x) = (½) × (10)
It can be written as:
2x/2 = 10/2
x = 5, which is the required solution for the given linear equation in one variable 2x – 3 = 7.

Let us consider an another example, 2x + 4 = 12
Now, keep the tern 2x on the left hand side and bring 4 on the right hand side of the equation.
So, we get
2x = 12 – 4
2x = 8
x = 8/2
x = 4

Solving Equations with variables on both sides

Let's say we need to figure out 3x – 3 equals x + 2. Both sides of the equation in this case contain variables.
First, move all of the phrases that contain variables from the right side of the equation to the left, and all of the constants from the left side to the right.

3x−x=2+3
⇒2x=5
Step 2: Divide both sides of the equation by the coefficient of the variable.
(½) × (2x) = (½) × 5
We can write the above equation as follows:
2x/2 = 5/2
Now, cancel out 2 on the left hand side of the equation, we get
x = 5/2, which is the required solution.

Applications (Word Problems)

Question:
The sum of two numbers is 74. If one of the numbers is 10 more than the other number, find the two numbers.
Solution:
Let one of the numbers be *x.*

Then the other number is $x + 10$.

Given that the sum of the two numbers is 74.

So, x+(x+10)=74

⇒2x+10=74

⇒2x=74−10=64

x = 64/2

x = 32

Therefore, one number is 32.

As given, the one of the numbers is 10 more than the other, we get x + 10

= 32 + 10

= 42.

Therefore, the two numbers are 32 and 42.

Equations Reducible to the Linear Form

Question:

$(x+1)/(2x + 3) = ⅜$

Solution:

Given equation: $(x+1)/(2x + 3) = ⅜$

Now, cross multiply the equation, we get

8(x + 1) = 3(2x + 3)

8x + 8 = 6x + 9

Now, bring the variables on one side and constants on the other side,

8x – 6x = 9 – 8

On simplifying the above equation,

2x = 1

x = ½.

Now, this can be written as:

x – (½) = 0

Reducing Equations to Simpler Form

Question:

Simplify the equation: [(6x + 1)/3] + 1 = (x – 3)/6. Also, justify your answer.

Solution:

Given Equation: [(6x + 1)/3] + 1 = (x – 3)/6

To simplify the given equation, take the LCM of 3 and 6, which is 6.

Now, multiply both sides of the equation by 6, we get

[6(6x + 1)/3] + 1(6) = 6(x – 3)/6

2(6x+1) + 6 = x – 3

12x + 2 + 6 = x – 3

Now, bring all the terms with variables on one sides and constants on the other side.

So, we get

12x + 8 = x – 3

12x – x = -3 – 8

11x = -11

x = -11/11

x = -1

Hence, the simplification of [(6x + 1)/3] + 1 = (x – 3)/6 is x = -1, which is the required solution.

Justification:

Now, substitute x = -1 in the given equation.

LHS: [(6x + 1)/3] + 1

LHS = [(6(-1) + 1)/3] + 1

LHS = [(-6 + 1)/3] + 1

LHS = (-5/3) + 1

LHS = (-5 + 3) /3

LHS = $-\frac{2}{3}$

Now, take the expression on the right side of the given equation.

RHS = (x – 3)/6

RHS = (-1 – 3)/6

RHS = -4/6

RHS = $-\frac{2}{3}$

Therefore, LHS = RHS.

Hence, verified.

Benefits of CBSE Class 8 Maths Notes Chapter 2

The benefits of studying Chapter 2 of CBSE Class 8 Maths, **Linear Equations in One Variable**, include:

Improved Problem-Solving Skills: Learning to solve linear equations enhances logical thinking and analytical abilities, helping students tackle a variety of mathematical problems.

Foundation for Algebra: The chapter provides a solid base for understanding algebraic concepts, which are essential in higher classes and advanced mathematics.

Real-World Application: Students learn to translate real-life situations into linear equations, making the concept highly practical for daily problem-solving, such as budgeting and planning.

Mastery of Arithmetic Operations: The focus on operations like addition, subtraction, multiplication, and division strengthens core arithmetic skills.

Enhanced Conceptual Understanding: Solving equations with variables on both sides, fractions, and decimals builds a deeper understanding of how to manipulate and simplify expressions.