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

Equation: An equation is a statement of equality which contains one or more unknown quantity/ quantities (or variable/variables) is called an equation.

Linear Equation in One Variable: An equation is called linear equation if it has only one degree i.e., the highest power of the variable appearing in equation is 1, and the form of linear equation is
P(x) = ax + b = 0
e.g., x + 5 = 0, $\frac{x}{2}$ − 7 = 15.

Solving an Equation: Solving an equation means determining its root i.e., determining (finding) the value of the variable which satisfies it.

A linear equation may have any rational number, as its solution.

An equation may have a linear expression on both sides of the equation.

Some equations may not be linear in the beginning, but they can be brought to be linear by using usual methods.

The utility of linear equations is in their diverse applications, different problems on numbers, ages, perimeters, the combination of currency notes and so on can be solved using linear equations.

A number which satisfies an equation is called the solution of the equation.

A term may be transposed from one side of the equation to the other side, but its sign will be changed.

In the preceding class, we have learned about algebraic expressions and equations. Here, we shall confine ourselves to the study of linear equations in one variable.

An equation essentially contains a sign of equality (=).

Also, the expression we use to form a linear equation is linear only, i.e., the highest power of the variable occurring in the expression is 1 and that too only in one variable.

The expression on the left of the sign of equality is called the Left-Hand Side whereas the expression on the right of the sign of equality is called the Right Hand Side.

The value of the variable for which LHS = RHS is called a solution of the linear equation.

To find the solution of a linear equation in one variable, we assume that the two sides of the equation are balanced.

We are free to perform the same operation (suitable) on both sides of the equation such as we can add to or subtract from both sides of the equation the same quantity (number).

Also, we can multiply or divide both sides of the equation by the same non-zero quantity (number).

Solving Equations which have Linear Expressions on One Side and Numbers on the Other Side
We transpose the numbers from LHS to RHS and simplify. Then, we divide both sides by the coefficient of the variable to get the solution.
Finally, we check the solution by substituting it in LHS and checking whether RHS is obtained or not by doing so.
If LHS = RHS, the solution is said to be valid. Reject if the solution is invalid. Note: The process of carrying out a term from one side to the other side is called transposition. In this process, the sign of the term gets changed.
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In daily life, there come many simple problems which can be easily solved by first forming a linear equation in one variable according to the given condition of the problem and then solving this linear equation by following usual procedure.

Stepwise procedure to solve a word problem.

- Read the given word problem carefully and identify what is given and what is required.
- Use letters x, y, z, etc. to represent the unknown quantity.
- Transform the statements of the problem into mathematical statements.
- Form the linear equation according to the given condition (s) of the problem.
- Solve the equation by the usual method.
- Check the solution for its validity.
- Reject if the solution is invalid.

Solving Equations having the Variable on Both Sides

We transpose the terms in such a manner that the terms containing the variables are on the LHS and constant numbers on RHS.

Then, simplifying both sides and dividing by a suitable number (if required), we can solve the equation.

Finally, check the validity of the solution obtained. Reject if the solution is invalid.

Some More Applications

Problems of multi-varieties occur in our daily life. All these can be solved by forming a suitable linear equation according to the condition given in the problem and then solving this equation by usual method. Finally check the validity of the solution. Reject if the solution is invalid.

Reducing Equations to Simpler Form

We multiply both sides of the equation by the LCM of the denominators of the terms in the expressions occurring in the given equation.

We transpose properly so that all the variable terms come on LHS and constant terms on RHS.

Then, combining like terms on both sides of the equation and dividing both sides by a suitable number (if required), we can find out the required solution.

Finally, we check this solution for its validity. Reject if the solution is invalid.