



ONLINE STUDY MATERIAL

SUBJECT- Mathematics

SESSION-2020-21

CLASS- VII

CHAPTER No- 4

TOPIC: Simple Equations (linear equation in one variable)

DAY-1

❖ NOTES

- ★ **Linear Equations** :- An equation is a statement of equality which contains one or more unknown qualities or variable.
- ★ An equation involving only a linear polynomial is called a linear equation.
eg - $7x + 3 = 5$
- ★ **Solution of a linear equation** :- The value of the variable which makes the equation a true statement is called the solution or root of the equation.
- To solve an equation is to find a value of the variable which satisfies the equation.
Example Verify that $x = 2$ is a root of the equation $5x - 12 = -2$

Solution:- Substituting $x = 2$ in the given equation , we get

$$\text{LHS} = 5 \times 2 - 12 = 10 - 12 = -2 = \text{RHS}$$

Therefore, $x = 2$ is a solution of the equation $5x - 12 = -2$

Linear Equation in One Variable

A linear equation in one variable is an equation that can be written in the form

$$ax + b = 0$$

Where $a \neq 0$

For example:

$$5x - 4 = 0, 2x + 1 = 0, 8x + 9 = 2$$

Type of Equation

Linear Equation in one variable- equation that can be written in the form . . .

$$ax + b = c \text{ or } ax = b$$

where a, b, c are constants and $a \neq 0$

ex. $3x + 9 = 0$

ex. $7x + 5 = 2x - 9$

ex. $4(x - 2) = 6$

ex. $x = 6$

❖ VIDEO-LINKS

LINK-1 <https://youtu.be/IDOYdBgtjY>

DAY-2

Topic :- Rules for solving an equation

- The same quantity can be added to both sides of an equation without changing the equality.
- The same quantity can be subtracted from both sides of an equation without changing the equality.
- Both sides of an equation may be multiplied by the same nonzero number without changing the equality.
- Both sides of an equation may be divided by the same nonzero number without changing the equality.

Transposition :- Any term of an equation may be taken from one side to the other with a change in its sign. This does not affect the equality of the statement. This process is called transposition.

Some examples

Linear Equations in One Variable

Example

$$4p - 11 - p = 2 + 2p - 20$$

$$3p - 11 = 2p - 18$$

$$3p + (-2p) - 11 = 2p + (-2p) - 18$$

$$p - 11 = -18$$

$$p - 11 + 11 = -18 + 11$$

$$p = -7$$

$$\frac{5}{4}x + \frac{1}{2} = 2x - \frac{1}{2}$$

$$\langle 4 \rangle \left(\frac{5}{4}x + \frac{1}{2} \right) = \langle 4 \rangle \left(2x - \frac{1}{2} \right)$$

$$5x + 2 = 8x - 2$$

$$5x + 2 - 8x = 8x - 2 - 8x$$

$$-3x + 2 = -2$$

$$-3x + 2 - 2 = -2 - 2$$

$$-3x = -4$$

$$\frac{-3x}{-3} = \frac{-4}{-3}$$

$$x = \frac{4}{3}$$

DAY-3

EXERCISE:

Solve the following equations. Check your result in each case

a). $3x - 5 = 0$

b). $3 + 2x = 1 - x$

c). $5(2x - 3) - 3(3x - 7) = 5$

d). $\frac{3}{2}x + 4 = \frac{1}{3}$

e). $3x + \frac{1}{5} = 2 - x$

f). $0.3x + 0.4 = 0.28x + 1.16$

g). $7 - 5x = 5 - 7x$

h). $3x + 2(x + 2) = 20 -$

VIDEO LINKS

<https://youtu.be/0BsoWvWXOMM>

NCERT LINKS

<http://www.ncert.nic.in/exemplar/exemplar.html>

Day 4

Word problems related to linear equations

We have learnt how to translate word statements about numbers in the form of equations. If a problem on numbers is given, we shall first translate it in the form of an equation and then solve it. The ideas will be clear from the examples given below.

Example:

- One number is 3 less than another number. If their sum is 49, find the two numbers.

Step 1: Let x be the first number.

Step 2: Let $x - 3$ be the second number.

Step 3: $x + (x - 3) = 49$

Step 4: $x + x - 3 = 49$

$$2x - 3 = 49$$

$$2x = 49 + 3$$

$$2x = 52$$

$$x = 26 \quad \text{the first number}$$

$$x - 3 = 23 \quad \text{the second number}$$

Step 5: Check: The sum of 26 and 23 is 49, and 23 is 3 less than 26.



Q.2 Find two numbers such that one of them exceeds the other by 9 and their sum is 81.

Solution. Let the smaller number be x

Then, the other number = $(x + 9)$

Therefore, $x + (x + 9) = 81$

$$2x + 9 = 81$$

$$2x = 81 - 9 \quad (\text{on transposing } 9 \text{ to RHS})$$

$$2x = 72$$

$$x = 72/2$$

$$x = 36$$

Hence, the one number = 36 and the other number = $(36 + 9) = 45$

DAY-5

EXERCISE:

Solve the following questions:-

- Twice a number when decreased by 7 gives 45. Find the number
- Find three consecutive positive even integers whose sum is 90.
- Two complementary angles differ by 8° . Find the angles.
- A dealer earned a profit of 5% by selling a radio for ₹ 714. Find the cost price of the radio.

CONCEPT MAP

