

ATOMIC ENERGY CENTRAL SCHOOL

Class- 7

Subject- MATHEMATICS

CHAPTER – 4

SIMPLE EQUATION (HAND OUT)

module- $\frac{2}{2}$

INTRODUCTION:

In the previous module we have learnt about constant number, variable, equation and its solution. In this module we shall learn more about simple equation.

We shall solve some more equations and verify (check) the answer.

Example: 1. $4x - 5 = 7$

So, $4x = 7 + 5$

So, $4x = 12$

So, $x = \frac{12}{4} = 3$

Here the solution is 3.

Check:-

LHS = $4x - 5 = 4 \times 3 - 5 = 12 - 5 = 7$

RHS = 7

So, LHS = RHS

2. $3(2x + 3) = x - 11$

Here first we open the bracket, $6x + 9 = x - 11$

Now we bring the variables to one side and the constants to other side by transposition.

$$6x - x = -11 - 9$$

So, $5x = -20$

$$x = \frac{-20}{5} = -4$$

So, here the solution is -4.

Check:-

LHS = $3(2x + 3) = 3\{2x(-4) + 3\} = 3(-8 + 3) = 3(-5) = -15$

RHS = $x - 11 = -4 - 11 = -15$

So, LHS = RHS

$$3. 2(2y - 4) = 3(y - 2)$$

Here first we open the bracket, $4y - 8 = 3y - 6$.

Now we bring the variables to one side and the constants to other side by transposition.

$$4y - 3y = -6 + 8$$

So, $y = 2$

Here the solution or root is 2

Check:-

$$\text{LHS} = 2(2y - 4) = 2(2 \times 2 - 4) = 2(4 - 4) = 4 \times 0 = 0$$

$$\text{RHS} = 3(y - 2) = 3(2 - 2) = 3 \times 0 = 0$$

So, $\text{LHS} = \text{RHS}$

FROM SOLUTION TO EQUATION

We can frame infinite numbers of equations for a particular solution.

a. Suppose we want a solution 3.

So, let $x = 3$

$$(1) 2 \times x = 3 \times 2 \text{ (here we multiply 2 with both the sides)}$$

$$\text{So } 2x = 6$$

$$(2) x + 2 = 3 + 2 \text{ (here we add 2 with both the sides)}$$

$$x + 2 = 5$$

$$(3) \frac{x}{3} = \frac{3}{3} \text{ (here we divide 3 to both the sides)}$$

$$\frac{x}{3} = 1$$

$$(4) 3 \times x = 3 \times 3 \text{ (here we multiply 3 with both the sides)}$$

$$3x = 9$$

$$3x + 2 = 9 + 2 \text{ (here we add 2 with both the sides)}$$

$$3x + 2 = 11$$

In this way we can frame a large numbers of equations.

b. Suppose we want a solution - 7.

Let $y = -7$

$$(1) y \times 3 = -7 \times 3 \text{ (here we multiply 3 with both the sides), so } 3y = -21.$$

(2) $3y - 5 = -21 - 5$ (here we subtract 5 from both sides)

$$3y - 5 = -26.$$

(3) $3y + 8 = -21 + 8$ (here we add 8 with both the sides)

$$\text{So, } 3y + 8 = -13$$

APPLICATIONS OF SIMPLE EQUATIONS TO PRACTICAL SITUATIONS.

1. The sum of five times a number and 18 is 63. Find the number.

Let the number = x

5 times of the number = $5x$

ATP-

$$5x + 18 = 63$$

Or, $5x = 63 - 18$ (transposing 18 from left to right side)

$$\text{Or, } 5x = 45$$

Or $x = \frac{45}{5} = 9$ (transposing 5 from left to right side)

2. The sum of three consecutive integers is 12 more than twice the smallest integer. Find the integer.

Let the integers are x , $x+1$ and $x+2$.

Sum of integers = $x+x+1+x+2 = 3x + 3$

Smallest integer = x

ATP-

$$3x+3 = 2x + 12$$

or $3x - 2x = 12 - 3$ (we bring the variables to one side and the constants to other side by transposition.)

or, $x = 9$

The integers are-

$$X = 9$$

$$X+1 = 9+1 = 10$$

$$X+2 = 9 + 2 = 11$$

3. Anish has 10 toy cars more than 4 times the toy cars Sweta has. Anish has 46 toy cars. How many toy cars does Sweta have?

Let number of toy cars Sweta has = x

Number of toy cars Anish has = 46

ATP-

$$4x + 10 = 46$$

$$\text{Or } 4x = 46 - 10 = 36$$

$$\text{Or } x = \frac{36}{4} = 9$$

So, Sweta has 9 toy cars.

What we have learnt-

- More about the systematic method of solving the equations.
- Framing of equations for a particular solution as given.
- Applications of equation for solving day to day situations.

ASSIGNMENTS:-

1. Solve the equations

$$(a) \frac{2x}{3} - 8 = 10$$

$$(b) 5m + \frac{3}{5} = 10$$

$$(c) 3(x - 4) = 25$$

$$(d) 4(2n + 5) = 2n - 8 \quad (e) -5(x - 2) = -2$$

2. (i) Frame 4 equations with $x = 5$.

(ii) Frame 4 equations with $x = -3$.

(iii) Frame 3 equations with $y = -5$.

3. One-fourth of a number x minus 4 gives 4. Find x .

4. If you add 3 to one-third of a number, you get 30. Find the number.

5. When 16 is subtracted from seven times a number the answer is five times the number. Find the number.

6. Prabhat's age is 57 years more than five times the age of his son. Find the age of his son. If his age is 40 years.

7. When you subtract 15 from twice of a number, the result is 35. Find the number.

8. A municipal corporation planted mango trees and guava trees along the sides of a park. The number of mango trees is 5 more than twice of guava trees. If the number of mango trees is 25, find the number of guava trees.

9. Solve $\frac{3x}{2} = \frac{5x+8}{6}$ G.P.JANA

