Class- 7   **Subject- MATHEMATICS**

CHAPTER – 4

SIMPLE EQUATION (HAND OUT)   module-$\frac{1}{2}$

INTRODUCTION:

Before learning learning simple equation we should know about the constant number and variable.

Constant number: The number which has a fixed value is called a constant. It has the same everywhere and in any situation.

.For example- 0, 1, 2, 3, 4, ---------------------

Variable: The number which has different numerical values depending upon the situation is called a variable.

Generally variables are represented by using the English alphabets like- k,l,m,n,p ,q,r,s,t,x,y,z etc.

Sometimes we play the mind reader, like,Ashu asks her friend Raman to think a number, multiply the number by 2 and add 5 with the product. NowAshu ask Raman what is his result? Raman says the result is 25.Ashu tells that the number you have thought is 10.Raman says yes it is 10.

Now the question is how Ashu gets the answer. Ashu has applied the knowledge of equation.

She frames the equation like $2x + 5 = 25$.

Now we shall learn about the equation

EQUATION- Equation is a statement of equality consisting of one or more variable(s) and it holds true for certain value of the variable.

Example: $x – 5 = 10$

An equation has two sides like, left hand side (LHS) and right hand side (RHS)

Here LHS = $x – 5$ and RHS = 10

WRITING THE STATEMENT IN THE FORM OF EQUATION:

For this purpose we consider a variable for the unknown number and use the sign of fundamental operation of Mathematics.

Example:

 (a) Twice (two times or double) of a number is 78.

   Let the number is x

So, $2x = 78$

(b) Thrice (three times) of a number is 34.

Let the number is y

$3y = 34$

(c) The difference of five times of a number and 11 is 28.

Let the number is x

$5x - 11 = 28$

(d) One – fourth of a number minus 8 is 18

Let the number is y

$\frac{1}{4}y - 8 = 18$

(e) If you add 10 to 5 times of a number, you get 24

Let the number is y

$5y + 10 = 24$

(f) If one fifth of x is 4 more than 9.

$\frac{1}{5}x - 9 = 4$ or $\frac{1}{5}x = 4 + 9 = 13$

(g) Half of a number plus 8 is 18.

Let the number is x

$\frac{1}{2}x + 8 = 18.$

Write a statement for the following equations:

(a) $2x - 5 = 15$

Subtracting 5 from twice of a number is 15.

(b) $\frac{3}{2}x + 7 = 5$

The sum of 7 and half of three times a number is 5.

(c) $2y - 3 = 7$

Taking away 3 from twice of a number is 7.

SOLUTION OF AN EQUATION

The value of the variable involved with the equation which satisfies the equation is called its solution.

Note: satisfying the equation means, the value of the variable for which LHS = RHS.

Example- x+ 3 = 5, here if you take x=1, then LHS = 1+ 3 = 4, but RHS = 5, so x = 1 does not satisfy the equation. If we take x = 2 then LHS = 2+ 3 = 5, and RHS = 5, so LHS = RHS, so x = 2 satisfies the equation. So the solution of this equation is 2.

Rules for finding the solution:

(a) Transposition- Moving a number from one side to another side. On transposition of a number from one side to another side the sign of the number changes. Such that + to -,- to +, × to ÷ and ÷ to ×.

(b)When we (i) add the same number to both sides (ii) substract the same number from both sides

 (iii) Multiplythe same number to both sides (iv) divide the same number to both sides .then the equation does not change.

Example: (i) $x + 7 = 10$

 To separate the variable, here 7 is transposed from left to right, so its positive sign become negative

 $x = 10 - 7= 3$,.

OR $x + 7 = 10$, To separate the variable, we have to substract 7 from both the sides.

So, $x + 7 - 7 = 10 - 7$

 $x = 3$.

 (ii) $4y - 5 = 7$

To separate the variable, here we first transpose 5 from left to right side

So, $4y = 7 + 5 = 12$

   Then we transpose 4 from left to right side

 $Y = 12 \div 4 = 3$

(iii) $\frac{x}{5} = 7$

To separate the variable,here we have to transpose 5 from left to right side.

 $X = 7 \times 5 = 35$

(iv) $\frac{-2x}{5} = 4$

  $-2x = 4 \times 5 = 20$; $x = \frac{20}{-2}$: $x = -10$

(v) $\frac{4n}{3} - 5 = 15$

$\frac{4n}{3} = 15 + 5 = 20$

  $4n = 20 \times 3 = 60$

   $n = \frac{60}{4} = 15$

What we have learnt

(i) Constant and Variable.

(ii) Concept of equation.

(iii) Solution of the equation.

(iv) Rule to solve the equation.

ASSIGNMENT:

1. Fill in the blanks-

(i) Value of the variable which makes the equation a true statement is known as -----------.

(ii) If the LHS and RHS of an equation areinterchanged, then the equation remains -------.

(iii) Movement of number from one side to another side of an equation is called --------.

(iv)If the same quantity is added to both sides of an equation, then the equation remains -------.

(v) The solution of the equation $2x + 5 = 15$ is --------------.

2. Write the equations of the following statements:

a. The sum of half of a number and 3 is 16.

b.6 is subtracted from thrice of a number is 15.

3.Write the statement of the following equations:

a. $3y + 5 = 8$ b.$\frac{1}{2}x - 3 = 5$

4. Solve the following equation:

a.$x - 4 = 5$

b .$y + 6 = 7$

c.$8x = 56$

d, $\frac{m}{6} = 7$

e.$4x - 2 = 6$

f.$5q + 9 = 19$

g. $5y + 15 = 0$

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