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

= 4x3 -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)

  = 3x(- 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:-
- LHS= $2(2y - 4)$
  $= 2 (2x2 – 4)$
  $= 2 (4 – 4)$
  $= 4 x 0 = 0$
- RHS= $3(y – 2) = 3(2 – 2) = 3x 0$
  $= 0$
- So, LHS = 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 $y = 3$
- (1) $2 \times y = 3 \times 2$ (here we multiply 2 with both the sides)
- So $2y = 6$

- (2) $x + 2 = 3+2$
  (here we add 2 with both the sides)

  $x + 2 = 5$

- (3) $\frac{x}{3} = \frac{3}{3}$
- (here we divide 3 to both the sides)
- $\frac{x}{3} = 1$

- (4) $3 \times x = 3 \times 3$
(here we multiply 3 with both the sides)
- $3x = 9$
- $3x + 2 = 9 + 2$ (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) $y \times 3 = -7 \times 3$

(here we multiply 3 with both the sides)

- So, $3y = -21$

- (2) $3y - 5 = -21 - 5$
(here we substract 5 from both sides)
- $3y - 5 = -26.$
- (3) $3y + 8 = -21 + 8$
(here we add 8 with both the sides)
- 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)
- 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 of Sweta .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-
- $4x + 10 = 46$
- Or, $4x = 46 - 10 = 36$
- Or, $x = \frac{36}{4} = 9$
- So, Sweta has 9 toy cars.

- What we have learnt-
- a. More about the systematic method of solving the equations.
- b. Framing of equations for a particular solution as given.
- c. 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) $4(2n + 5) = 2n - 8$

(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 57years more than five times the age of his son. Find the age of his son. If his age is 40 years.
- 7. When you substract 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 $\frac{3x}{2} = \frac{5x+8}{6}$
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