chapter : 7 simple linear equations

algebraic equation: when we connect to algebraic expressions with the help of equal to sign we get a algebraic equation

Ex1:. $5x^2+10x+2 = 7x^2 + 3x + 8$

Ex2:. $3xyz + 2xy = 4xy + abc$

linear equation: an algebraic equation who's highest degree is one is known as linear equation

Ex:1) $x+y = 2$ (Two variables)

Ex:. 2) $2x+3y+4z = 10$ (Three variable)

Ex:3 $x+5 = 15$ (one variable)

linear equation in one variable: a linear equation which consists of only one variable is known as linear equation in one variable

Ex:. $2y + 3y = 10$

Ex: $2x + 10 = 3x + 5$

Ex $3z + 10 = 10z + 3$

Solution / Root of linear equation :-

The numerical value of the variable satisfying the linear equation is known as its Solution or root.

Ex:- $x + 5 = 12$

Here LHS $= x + 5$

Now for $x = 7$

LHS $= 7 + 5 = 12 =$ RHS

$\therefore$ $x = 7$ is solution of $x + 5 = 12$

1. Form an equation for each of the following statements.

(a) A number increased by 3 is equal to 5.

(b) 3 times a number added to 7 gives 13.

(c) One number is twice the other and their sum is 15.

(d) Half a number is 18 less than twice the number.

(a) let the number be x

Then ACQ

$$x+3=5$$

(b) let the number be x

ACQ

$$3x+7=13$$

(c) let first numbe x

Then second number $2x$

ACQ,

$$x+2x=15$$

(d) let the number x

ACQ

$$\frac{1}{2}x = 2x-18$$

2. Solve the following equations using the trial and error method.

(a) $2x + 4 = 8$ (b) $11 + 2x = 19$ (c) $\frac{12}{m} = 3$ (d) $\frac{x}{3} + 5 = 7$

(a) Given: $2x + 4 = 8$

LHS $= 2x + 4$ and RHS $= 8$

i) let $x = 1$

LHS $= 2(1) + 4 = 2 + 4 = 6$

$\therefore$ LHS $\neq$ RHS

ii) let $x = 2$

LHS $= 2(2) + 4 = 4 + 4 = 8$

$\therefore$ LHS $=$ RHS

$\therefore$ solution is $x = 2$

(b) $11 + 2x = 19$

Given:- LHS $= 11 + 2x$ and RHS $= 19$

i) let $x = 1$

LHS $= 11 + 2(1) = 11 + 2 = 13$

LHS $\neq$ RHS

ii) let $x = 2$

LHS $= 11 + 2(2) = 11 + 4 = 15$

LHS $\neq$ RHS

iii) let $x = 3$

$LHS = 11 + 2(3) = 11 + 6 = 17$

$LHS \neq RHS$

iv) let $x = 4$

$LHS = 11 + 2(4) = 11 + 8 = 19$

$LHS = RHS$

∴ solution is $x = 4$

c) $\frac{12}{m} = 3$

Given: $LHS = \frac{12}{m}$ and $RHS = 3$

i) let $m = 1$

$LHS = \frac{12}{1} = 12$

$LHS \neq RHS$

ii) let $m = 2$

$LHS = \frac{12}{2} = 6$

$LHS \neq RHS$

iii) let $m = 3$

$LHS = \frac{12}{3} = 4$

$LHS \neq RHS$

iv) let $m = 4$

$LHS = \frac{12}{4} = 3$

$LHS = RHS$

∴ solution is $m = 4$

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

→ LHS $= \frac{x}{3} + 5$, RHS $= 7$

i) let $x = 1$

$$LHS = \frac{1}{3} + 5 = \frac{1}{3}^{\times 1} + \frac{5}{1}^{\times 3} = \frac{1+15}{3} = \frac{16}{3}$$

LHS ≠ RHS

ii) let $x = 2$

$$LHS = \frac{2}{3} + 5 = \frac{2}{3}^{\times 1} + \frac{5}{1}^{\times 3} = \frac{2+15}{3} = \frac{17}{3}$$

LHS ≠ RHS

iii) let $x = 3$

$$LHS = \frac{3}{3_1}^{1} + 5 = 1 + 5 = 6$$

LHS ≠ RHS

iv) let $x = 4$

$$LHS = \frac{4}{3} + 5 = \frac{4}{3}^{\times 1} + \frac{5}{1}^{\times 3} = \frac{4+15}{3} = \frac{19}{3}$$

LHS ≠ RHS

v) let $x = 5$

$$LHS = \frac{5}{3} + 5 = \frac{5}{3}^{x1} + \frac{5}{1}^{x3} = \frac{5+15}{3} = \frac{20}{3}$$

$LHS \neq RHS$

vi) let $x = 6$

$$LHS = \frac{6^2}{3_1} + 5 = 2 + 5 = 7$$

$LHS = RHS$

$\therefore$ Solution is $x = 6$