

## Chapter – 02

### Linear Equations in One Variable

#### Exercises. 2.6

**Question 1.** Solve the following equations.

$$\frac{8x-3}{3x} = 2$$

**Answer:**

The given Equation can be written as:

$$\frac{8x-3}{3x} = \frac{2}{1}$$

$$8x - 3 = 2 \times 3x$$

$$8x - 3 = 6x$$

On Solving this By Cross Multiplication,

$$8x - 6x = 3$$

$$2x = 3$$

$$x = \frac{3}{2}$$

**Question 2.** Solve the following equations.

$$\frac{9x}{7-6x} = 15$$

**Answer:**

The given equation can be written as:

$$\frac{9x}{7-6x} = \frac{15}{1}$$

Now, on doing Cross Multiplication we have,

$$9x = 15(7 - 6x)$$

$$9x = 105 - 90x$$

$$9x + 90x = 105$$

$$99x = 105$$

$$x = \frac{105}{99}$$

$$x = \frac{35}{33}$$

**Question 3.** Solve the following equations.

$$\frac{z}{z+15} = \frac{4}{9}$$

**Answer:**

$$\frac{z}{z+15} = \frac{4}{9}$$

By Cross Multiplication,

$$9z = 4(z + 15)$$

$$9z = 4z + 60$$

$$5z = 60$$

$$z = 60/5$$

$$z = 12$$

**Question 4.** Solve the following equations.

$$\frac{3y+4}{2-6y} = \frac{-2}{5}$$

**Answer:**

$$\frac{3y+4}{2-6y} = \frac{-2}{5}$$

$$5(3y + 4) = -2(2-6y) \Rightarrow 15y + 20 = -4 + 12y \Rightarrow 15y - 12y = -4 - 20 \Rightarrow 3y = -24 \Rightarrow y = -8$$

**Question 5.** Solve the following equations.

$$\frac{7y+4}{y+2} = \frac{-4}{3}$$

**Answer:**

Multiplying by  $3(y+2)$  on both the sides we get,

$$3(7y+4) = -4(y+2)$$

$$21y + 12 = -4y - 8$$

$$25y = -20$$

$$y = -\frac{4}{5}$$

**Question 6.** The ages of Hari and Harry are in the ratio 5:7. Four years from now the ratio of their ages will be 3:4. Find their present ages.

**Answer:**

Let the present ages of Hari and Harry are  $5x$  and  $7x$

Then, four years later, Hari age will be  $5x + 4$  years and Harry age will be  $7x + 4$  years

Now,

Ratio of ages of Hari and Harry after four years = 3:4

Therefore,

$$\frac{5x+4}{7x+4} = \frac{3}{4}$$

Multiplying on both the sides by,  $4(7x + 4)$

$$4(5x + 4) = 3(7x + 4)$$

$$20x + 16 = 21x + 12$$

$$16 - 12 = 21x - 20x$$

$$4 = x$$

Thus, presently, Hari age is 20 and Harry age is 28

**Question 7.** The denominator of a rational number is greater than its numerator by 8. If the numerator is increased by 17 and the denominator is decreased by 1, the number obtained is  $\frac{3}{2}$ . Find the rational number.

**Answer:**

Let the numerator of rational number is  $x$  and the denominator of rational number is  $y$ .

$$\because \text{Denominator } y = x + 8$$

$\therefore$  The rational number is

$$\frac{x}{y} = \frac{x}{x+8}$$

Now according to question,

$$\frac{x+17}{x+8-1} = \frac{3}{2}$$

Cross multiplying both sides, we get

$$2x + 34 = 3x + 21$$

$$34 - 21 = 3x - 2x$$

$$13 = x$$

Thus, numerator = 13 and denominator = 21

Therefore, rational number is  $\frac{13}{21}$

[Since, denominator,  $y = x + 8$ , denominator =  $13 + 8 = 21$ ]