CLASS 8 MATHEMATICS

Linear Equations In One Variable – Chapter2

Exercise 2.6

Solve the following equations.

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

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

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

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

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

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.

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.

ANSWERS:

1. Multiplying both sides by 3x,

8x -3 = 3x (2)

8x -3 = 6x (Transposing variables to one side)

8x – 6x = 3

2x = 3

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

2. Multiplying both sides by (7-6x),

9x = 15(7-6x)

9x = 105 – 90x (opening the brackets)

9x + 90x = 105 (Transposing variables to one side)

99x = 105

x = $\frac{105}{99}$ =$\frac{35}{33}$. (3 is a common factor, so divide both denominator and numerator by 3).

3. Cross multiplication gives 9z = 4(z+15)

9z = 4z + 60

9z – 4z = 60 (Transposing variables to one side)

5z = 60

z = $\frac{60}{5}$ = 12.

4. Cross multiplication gives 5(3y +4) = -2(2 – 6y)

15y + 20 = -4 + 12y (opening the brackets)

15y – 12y = -4 – 20

3y = -24

y = $\frac{-24}{3}$ = -8

5. Cross multiplication gives 3(7y +4) = -4(y+2)

21y + 12 = -4y – 8 (opening the brackets)

21y + 4y = -8 – 12 (Transposing the variables and constants to one side)

25y = -20

y = $\frac{-20}{25}$ = $\frac{-4}{5}$ (5 is a common factor, so divide both numerator and denominator by 5).

6. Given ratio is 5:7.

Let the ages of Hari and Harry be 5x and 7x years respectively.

After 4 years, Hari's age = (5x +4) years and Harry's age = (7x +4) years.

Therefore, the ratio of their ages after 4 years =$\frac{5x+4}{7x+4}$.

Four years from now the ratio of their ages will be 3:4.

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

Cross multiplication gives 4(5x +4) = 3(7x +4)

Or 20x +16 = 21x + 12

Or 20x -21x = 12 – 16

-x = -4

x = 4

Therefore, Hari's present age = 5x = 20 years

Harry's present age = 7x = 28 years.

7. Let the numerator be x.

Then denominator = x +8 (given)

If the numerator is increased by 17, x becomes x +17 and the denominator is decreased by 1, x+8 becomes x+8-1.

As per the given conditions, we have$\frac{x+17}{x+7} = \frac{3}{2}$.

Cross multiplication gives 2(x+17) = 3(x+7)

2x + 34 = 3x + 21 (opening the brackets)

2x – 3x = 21 – 34

-x = -13

x = 13, which is the numerator.

Denominator = x+8 = 13 + 8 = 21.

Hence the required rational number is$\frac{13}{21}$.