



SpeedLabs

MATHS

CBSE 8th

TEEVRA EDUTECH PVT. LTD.

Linear Equation

Exercise-2.6

Q.1 Solve the following Equation, $\frac{8x-3}{3x} = 2$

Sol: The given equation is $\frac{8x-3}{3x} = 2$

$$\Rightarrow \frac{8x-3}{3x} \times 3x = 2 \times 3x \quad (\text{Multiplying both sides by } 3x)$$

$$\Rightarrow 8x - 3 = 6x$$

$$\Rightarrow 8x - 6x = 3 \quad (\text{Transposing } 6x \text{ to L.H.S. and } 3 \text{ to R.H.S.})$$

$$\Rightarrow 2x = 3 \Rightarrow \frac{2x}{2} = \frac{3}{2} \quad (\text{Dividing both sides by } 2)$$

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

Hence, $x = \frac{3}{2}$ is the required solution.

Q.2: Solve the following Equation, $\frac{9x}{7-6x} = 15$

Sol: The given equation is $\frac{9x}{7-6x} = 15$

$$\Rightarrow \frac{9x \times (7-6x)}{(7-6x)} = 15 \times (7-6x) \quad (\text{Multiplying both sides by } (7-6x))$$

$$\Rightarrow 9x = 15 \times (7-6x)$$

$$\Rightarrow 9x = 105 - 90x$$

$$\Rightarrow 9x + 90x = 105 \quad (\text{Transposing } 90x \text{ to L.H.S.})$$

$$\Rightarrow 99x = 105 \Rightarrow x = \frac{105}{99} \quad (\text{Dividing both sides by } 99)$$

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

Hence, $x = \frac{35}{33}$ is the required solution.

Q.3 Solve the following Equation, $\frac{z}{z+15} = \frac{4}{9}$

Sol: The given equation is $\frac{z}{z+15} = \frac{4}{9}$

$$\Rightarrow \frac{z}{z+15} \times (z + 15) = \frac{4}{9} \times (z + 15) \text{ (Multiplying both sides by } (z + 15)\text{)}$$

$$\Rightarrow z = \frac{4}{9} \times (z + 15)$$

$$\Rightarrow 9 \times z = 9 \times \frac{4}{9} (z + 15) \text{ (Multiplying both sides by 9)}$$

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

$$\Rightarrow 9z = 4z + 60$$

$$\Rightarrow 9z - 4z = 60 \text{ (Transposing } 4z \text{ to L. H. S.)}$$

$$5z = 60$$

$$\Rightarrow \frac{5z}{5} = \frac{60}{5} \text{ (Dividing both sides by 5)}$$

$$\text{or } z = 12$$

Hence, $z = 12$ is the required solution.

Q.4 Solve the following Equation, $\frac{3y+4}{2-6y} = \frac{-2}{5}$

Sol: The given equation is $\frac{3y+4}{2-6y} = \frac{-2}{5}$

$$\Rightarrow \frac{(3y+4)}{(2-6y)} \times (2 - 6y) = \frac{-2}{5} \times (2 - 6y) \text{ (Multiplying both sides by } (2 - 6y)\text{)}$$

$$\Rightarrow (3y + 4) = \frac{-2}{5} \times (2 - 6y)$$

$$\Rightarrow (3y + 4) \times 5 = \frac{-2}{5} (2 - 6y) \times 5 \text{ (Multiply both sides by 5)}$$

$$\Rightarrow (3y + 4) \times 5 = -2(2 - 6y)$$

$$\Rightarrow 15y + 20 = -4 + 12y$$

$$\Rightarrow 15y - 12y = -4 - 20 \text{ (Transposing } 12y \text{ to L.H.S. and } 20 \text{ to R.H.S.)}$$

$$\Rightarrow 3y = -24$$

$$\Rightarrow y = \frac{-24}{3} \text{ (Dividing both sides by 3)}$$

or $y = -8$

Hence, the required value of y is -8

Q.5 Solve the following Equation, $\frac{7y+4}{y+2} = \frac{-4}{3}$

Sol: The given equation is $\frac{7y+4}{y+2} = \frac{-4}{3}$

$$\Rightarrow \frac{7y+4}{(y+2)} \times (y+2) = \frac{-4}{3} \times (y+2) \text{ (Multiplying both sides by } (y+2) \text{)}$$

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

$$\Rightarrow 3 \times (7y + 4) = 3 \times \frac{-4}{3} (y + 2) \text{ (Multiplying both sides by } 3 \text{)}$$

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

$$\Rightarrow 21y + 4y = -8 - 12 \text{ (Transposing } 4y \text{ to L.H.S. and } 12 \text{ to R.H.S.)}$$

$$\Rightarrow 25y = -20$$

$$\Rightarrow y = \frac{-20}{25} \text{ (Dividing both sides by } 25 \text{)}$$

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

Hence, $\frac{-4}{5}$ is the required solution.

Q.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.

Sol: Let the ages of Hari and Harry be $5x$ years and $7x$ years.

After four years, the age of Hari = $(5x + 4)$ years

and, the age of Harry = $(7x + 4)$ years

According to the conditions,

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

$$\Rightarrow \frac{5x+4}{7x+4} \times (7x+4) = \frac{3}{4} \times (7x+4) \text{ (Multiplying both sides by } (7x+4) \text{)}$$

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

$$\Rightarrow 4 \times (5x + 4) = 4 \times \frac{3}{4} \times (7x + 4) \text{ (Multiplying both sides by 4)}$$

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

$$\Rightarrow 20x - 21x = 12 - 16 \text{ (Transposing 21x to L.H.S. and 16 to R.H.S.)}$$

$$\Rightarrow x = 4$$

Hence, the age of Hari = $5x = 5 \times 4 = 20$ years and Age of Harry = $7x = 7 \times 4 = 28$ years.

Q.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.

Sol: Let the numerator of a rational number be x , the denominator is $x + 8$.

$$\text{Rational number} = \frac{x}{x+8}$$

According to the conditions,

$$\frac{x+17}{x+8-1} = \frac{3}{2} \Rightarrow \frac{x+17}{x+7} = \frac{3}{2}$$

$$\Rightarrow \frac{(x+17)}{(x+7)} \times (x+7) = \frac{3}{2} \times (x+7) \text{ (Multiplying both sides by } (x+7)\text{)}$$

$$\Rightarrow x + 17 = \frac{3}{2}(x + 7)$$

$$\Rightarrow 2 \times (x + 17) = 2 \times \frac{3}{2} (x + 7) \text{ (Multiplying both sides by 2)}$$

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

$$\Rightarrow 2x - 3x = 21 - 34 \text{ (Transposing 3x to L.H.S. and 34 to R.H.S.)}$$

$$\Rightarrow x = 13$$

Hence, the required rational number $\frac{x}{x+8} = \frac{13}{13+8} = \frac{13}{21}$.