

NCERT solution Linear equation Exercise 6

Question 1

Solve:

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

Answer

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

On multiplying both sides by $3x$, we obtain

$$8x - 3 = 6x$$

Transposing $6x$ to LHS and 3 to RHS

$$8x - 6x = 3$$

$$2x = 3$$

Dividing 2 on both the sides

$$x = 3/2$$

Question 2

Solve:

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

Answer

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

On multiplying both sides by $7 - 6x$, we obtain

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

$$9x = 105 - 90x$$

Transposing $90x$ on LHS

$$9x + 90x = 105$$

$$99x = 105$$

Dividing 99 on both the sides

$$x = 105/99$$

Question 3

Solve:

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

Answer

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

On multiplying both sides by $9(z + 15)$, we obtain

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

$$9z = 4z + 60$$

Transposing $4z$ on LHS

$$9z - 4z = 60$$

$$5z = 60$$

Dividing 5 on both the sides

$$z = 12$$

Question 4

Solve

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

Answer

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

On multiplying both sides by $5(2 - 6y)$, we obtain

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

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

Transposing $12y$ to LHS and 20 to RHS

$$15y - 12y = -4 - 20$$

$$3y = -24$$

Dividing by 3 on both the sides

$$y = -8$$

Question 5

Solve:

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

Answer

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

On multiplying both sides by $3(y + 2)$, we obtain

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

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

Transposing $4y$ to LHS and 12 to RHS

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

$$25y = -20$$

Dividing by 25 on both the sides

$$y = -20/25 = -4/5$$

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 common ratio between their ages be x . Therefore, Hari's age and Harry's age will be $5x$ years and $7x$ years respectively and four years later, their ages will be $(5x + 4)$ years and $(7x + 4)$ years respectively.

According to the situation given in the question,

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

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

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

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

Transposing $20x$ to RHS and 12 to LHS

$$4=x$$

$$x=4$$

Hari's age = $5x$ years = (5×4) years = 20 years

Harry's age = $7x$ years = (7×4) years = 28 years

Therefore, Hari's age and Harry's age are 20 years and 28 years respectively.

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 the rational number be x . Therefore, its denominator will be $x + 8$.

The rational number will be $\frac{x}{x+8}$ According to the question,

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

$$2(x + 17) = 3(x + 7)$$

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

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

$$13 = x$$

Numerator of the rational number = $x = 13$

Denominator of the rational number = $x + 8 = 13 + 8 = 21$