

CBSE NCERT Solutions for Class 8 Mathematics Chapter 2*Back of Chapter Questions***Exercise 2.1**

1. Solve the equation $x - 2 = 7$

Solution:

Given $x - 2 = 7$

Add 2 to both sides

$$\Rightarrow x - 2 + 2 = 7 + 2$$

$$\Rightarrow x = 9$$

2. Solve the equation $y + 3 = 10$

Solution:

Given $y + 3 = 10$

Subtract 3 from both sides

$$\Rightarrow y + 3 - 3 = 10 - 3$$

$$\Rightarrow y = 7$$

3. Solve the equation $6 = z + 2$

Solution:

Given $6 = z + 2$

Subtract 2 from both sides

$$\Rightarrow 6 - 2 = z + 2 - 2$$

$$\Rightarrow 4 = z + 0$$

$$\Rightarrow z = 4$$

4. Solve the equation $\frac{3}{7} + x = \frac{17}{7}$

Solution:

Given $\frac{3}{7} + x = \frac{17}{7}$

Subtract $\frac{3}{7}$ from both sides

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

$$\Rightarrow x + \frac{3}{7} - \frac{3}{7} = \frac{14}{7}$$

$$\Rightarrow x + 0 = 2$$

$$\Rightarrow x = 2$$

5. Solve the equation $6x = 12$

Solution:

Given $6x = 12$

Dividing both sides by 6

$$\Rightarrow \frac{6x}{6} = \frac{12}{6}$$

$$\Rightarrow x = 2$$

6. Solve the equation $\frac{t}{5} = 10$

Solution:

Given $\frac{t}{5} = 10$

Multiplying both sides by 5

$$\Rightarrow 5 \times \frac{t}{5} = 5 \times 10$$

$$\Rightarrow t = 50$$

7. Solve the equation $\frac{2x}{3} = 18$

Solution:

Given $\frac{2x}{3} = 18$

Multiplying both sides by 3

$$\Rightarrow 3 \times \left(\frac{2x}{3}\right) = 3 \times 18$$

$$\Rightarrow 2x = 54$$

Dividing both sides by 2

$$\Rightarrow \frac{2x}{2} = \frac{54}{2}$$

$$\Rightarrow x = 27$$

8. Solve the equation $1.6 = \frac{y}{1.5}$

Solution:

Given $1.6 = \frac{y}{1.5}$

Multiplying both sides by 1.5

$$\Rightarrow 1.5 \times 1.6 = 1.5 \times \left(\frac{y}{1.5}\right)$$

$$\Rightarrow 2.4 = y$$

$$\Rightarrow y = 2.4$$

9. Solve the equation $7x - 9 = 16$

Solution:

Given $7x - 9 = 16$

Adding 9 on both sides

$$\Rightarrow 7x = 16 + 9$$

$$\Rightarrow 7x = 25$$

Dividing both sides by 7

$$\Rightarrow x = \frac{25}{7}$$

10. Solve the equation $14y - 8 = 13$

Solution:

Given $14y - 8 = 13$

Transposing 8 to RHS

$$\Rightarrow 14y = 8 + 13$$

$$\Rightarrow 14y = 21$$

Divide by 14 on both sides

$$\Rightarrow \frac{14y}{14} = \frac{21}{14}$$

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

11. Solve the equation $17 + 6p = 9$

Solution:

Given $17 + 6p = 9$

Transposing 17 to RHS

$$\Rightarrow 6p = 9 - 17$$

$$\Rightarrow 6p = -8$$

Dividing both sides by 6

$$\Rightarrow \frac{6p}{6} = \frac{-8}{6}$$

$$\Rightarrow p = -\frac{4}{3}$$

12. Solve the equation $\frac{x}{3} + 1 = \frac{7}{15}$

Solution:

$$\text{Given } \frac{x}{3} + 1 = \frac{7}{15}$$

Transposing 1 to RHS

$$\Rightarrow \frac{x}{3} = \frac{7}{15} - 1$$

$$\Rightarrow \frac{x}{3} = \frac{7}{15} - \frac{15}{15}$$

$$\Rightarrow \frac{x}{3} = \frac{-8}{15}$$

Multiplying both sides by 3

$$\Rightarrow 3 \times \left(\frac{x}{3}\right) = 3 \times \left(\frac{-8}{15}\right)$$

$$\Rightarrow x = \frac{-8}{5}$$

Exercise 2.2

1. If you subtract $\frac{1}{2}$ from a number and multiply the result by $\frac{1}{2}$, you get $\frac{1}{8}$. What is the number?

Solution:

Let the number be x

According to question,

$$\left(x - \frac{1}{2}\right) \times \frac{1}{2} = \frac{1}{8}$$

Multiplying 2 to both sides

$$\Rightarrow \left(x - \frac{1}{2}\right) \times \frac{1}{2} \times 2 = \frac{1}{8} \times 2$$

$$\Rightarrow \left(x - \frac{1}{2}\right) = \frac{1}{4}$$

Adding $\frac{1}{2}$ on both sides.

$$\Rightarrow x = \frac{1}{2} + \frac{1}{4}$$

$$\Rightarrow x = \frac{3}{4}$$

Hence the number is $\frac{3}{4}$.

2. The perimeter of a rectangular swimming pool is 154 m. Its length is 2 m more than twice its breadth. What are the length and the breadth of the pool?

Solution:

Let the breadth be x m

The length will be $(2x + 2)$ m

We know that Perimeter = $2(l + b)$

Given perimeter of a pool = 154 m.

$$\Rightarrow 2(2x + 2 + x) = 154$$

$$\Rightarrow 2(3x + 2) = 154$$

$$\Rightarrow 3x + 2 = \frac{154}{2}$$

$$\Rightarrow 3x + 2 = 77$$

$$\Rightarrow 3x = 77 - 2 \text{ [transposing 2 to RHS]}$$

$$\Rightarrow 3x = 75$$

$$\Rightarrow x = \frac{75}{3}$$

$$\Rightarrow x = 25$$

Breadth = 25m.

Length = $2 \times 25 + 2 = 52$ m.

Hence, length is 52m and breadth is 25m

3. The base of an isosceles triangle is $\frac{4}{3}$ cm. The perimeter of the triangle is $4\frac{2}{15}$ cm. What is the length of either of the remaining equal sides?

Solution:

Given, Base of triangle = $\frac{4}{3}$ cm.

Perimeter of the triangle = $4\frac{2}{15}$ cm.

Let the length of equal sides be x cm

Perimeter = $x + x + \text{base}$

$$= 2x + \frac{4}{3}$$

$$\Rightarrow 2x + \frac{4}{3} = 4\frac{2}{15}$$

$$\Rightarrow 2x + \frac{4}{3} = \frac{62}{15} \text{ (given)}$$

Transposing $\frac{4}{3}$ to RHS

$$\Rightarrow 2x = \frac{62}{15} - \frac{4}{3}$$

$$\Rightarrow 2x = \frac{62 - 20}{15} = \frac{42}{15}$$

$$\Rightarrow 2x = \frac{14}{5}$$

On dividing both sides by 2

$$\Rightarrow x = \frac{14}{2 \times 5}$$

$$\Rightarrow x = \frac{7}{5}$$

Hence, length of remaining equal sides is $\frac{7}{5}$ cm.

4. Sum of two numbers is 95. If one exceeds the other by 15, find the numbers.

Solution:

Let the smaller number be x

Therefore, other number will be $x + 15$

Given, Sum of two numbers = 95.

According to question,

$$x + (x + 15) = 95$$

$$\Rightarrow 2x + 15 = 95$$

Transposing 15 to RHS

$$\Rightarrow 2x = 95 - 15$$

$$\Rightarrow 2x = 80$$

Dividing 2 on both sides

$$\Rightarrow \frac{2x}{2} = \frac{80}{2}$$

$$\Rightarrow x = 40$$

Therefore, the numbers are 40 and 55.

5. Two numbers are in the ratio 5: 3. If they differ by 18, what are the numbers?

Solution:

Let the numbers be $5x$ and $3x$ respectively.

$$\text{Given, } 5x - 3x = 18$$

$$\Rightarrow 2x = 18$$

Dividing both sides by 2.

$$\Rightarrow \frac{2x}{2} = \frac{18}{2}$$

$$\Rightarrow x = 9$$

$$\text{First number} = 5x$$

$$= 5 \times 9 = 45$$

$$\text{Second number} = 3x$$

$$= 3 \times 9 = 27$$

6. Three consecutive integers add up to 51. What are these integers?

Solution:

Given sum of three consecutive integers = 51.

Let the three consecutive integer be $x, x + 1$, and $x + 2$.

$$\text{Sum of these integers} = x + (x + 1) + (x + 2) = 51$$

$$\Rightarrow 3x + 3 = 51$$

Transposing 3 to RHS

$$\Rightarrow 3x = 51 - 3$$

$$\Rightarrow 3x = 48$$

On dividing both sides by 3

$$\Rightarrow \frac{3x}{3} = \frac{48}{3}$$

$$\Rightarrow x = 16$$

Other numbers are

$$x + 1 = 17$$

$$x + 2 = 18$$

Therefore, the consecutive integers are 16, 17 and 18.

7. The sum of three consecutive multiples of 8 is 888. Find the multiples.

Solution:

Given sum of three consecutive multiples of 8 is 888

Let the three consecutive multiples of 8 be $8x, 8(x + 1), 8(x + 2)$.

$$\text{Sum of these numbers} = 8x + 8(x + 1) + 8(x + 2) = 888$$

$$\Rightarrow 8(x + x + 1 + x + 2) = 888$$

On dividing both sides by 8

$$\Rightarrow \frac{8(3x + 3)}{8} = \frac{888}{8}$$

$$\Rightarrow 3x + 3 = 111$$

$$\Rightarrow 3x = 111 - 3$$

$$\Rightarrow 3x = 108$$

$$\Rightarrow \frac{3x}{3} = \frac{108}{3} \text{ [On dividing both sides by 3]}$$

$$\Rightarrow x = 36$$

$$\text{Smallest multiple} = 8x = 8 \times 36$$

$$= 288$$

$$\text{Next consecutive multiple} = 8(x + 1) = 8(36 + 1)$$

$$= 8 \times 37 = 296$$

$$\text{Second next consecutive multiple} = 8(x + 2) = 8(36 + 2)$$

$$= 8 \times 38 = 304$$

Therefore, multiples are 288, 296 and 304

8. Three consecutive integers are such that when they are taken in increasing order and multiplied by 2, 3 and 4 respectively, they add up to 74. Find these numbers.

Solution:

Let the three consecutive integers be x , $x + 1$ and $x + 2$

Given, Consecutive integer when multiplied by 2, 3, 4 respectively, they add up to 74.

According to question,

$$2x + 3(x + 1) + 4(x + 2) = 74$$

$$\Rightarrow 2x + 3x + 3 + 4x + 8 = 74$$

$$\Rightarrow 9x + 11 = 74$$

On transposing 11 to to RHS,

$$\Rightarrow 9x = 74 - 11$$

$$\Rightarrow 9x = 63$$

On dividing both sides by 9, we get

$$\frac{9x}{9} = \frac{63}{9}$$

$$\Rightarrow x = 7$$

Other numbers are

$$x + 1 = 8$$

$$x + 2 = 9$$

Therefore, the numbers are 7, 8 and 9.

9. The ages of Rahul and Haroon are in the ratio 5: 7. Four years later the sum of their ages will be 56 years. What are their present ages?

Solution:

Given ages of Rahul and Haroon are in ratio 5: 4.

Let age of Rahul and Haroon will be $5x$ years and $7x$ years respectively.

After 4 Years, the age of Rahul and Haroon will be $(5x + 4)$ and $(7x + 4)$ years respectively.

According to question,

$$(5x + 4 + 7x + 4) = 56$$

$$\Rightarrow 12x + 8 = 56$$

Transposing 8 to RHS

$$\Rightarrow 12x = 56 - 8$$

$$\Rightarrow 12x = 48$$

Dividing both sides by 12

$$\Rightarrow \frac{12x}{12} = \frac{48}{12}$$

$$\Rightarrow x = 4$$

Rahul's age = $5x$

$$= 5 \times 4$$

$$= 20 \text{ years}$$

Haroon's age = $7x$

$$= 7 \times 4$$

$$= 28 \text{ years}$$

Therefore, Rahul and Haroon's present ages are 20 years and 28 years respectively.

10. The number of boys and girls in a class are in the ratio 7: 5. The number of boys is 8 more than the number of girls. What is the total class strength?

Solution:

Given ratio of boys and girls in a class = 7: 5

Let, Number of boys = $7x$

Number of girls = $5x$

Given Number of boys = Number of girls + 8

$$\therefore 7x = 5x + 8$$

On transposing $5x$ to LHS

$$\Rightarrow 7x - 5x = 8$$

$$\Rightarrow 2x = 8$$

On dividing both sides by 2, we get

$$\Rightarrow \frac{2x}{2} = \frac{8}{2}$$

$$\Rightarrow x = 4$$

Number of boys = $7x = 7 \times 4 = 28$

Number of girls = $5x = 5 \times 4 = 20$

Total class strength = $28 + 20$

$$= 48$$

Therefore, total class strength = 48.

11. Baichung's father is 26 years younger than Baichung's grandfather and 29 years older than Baichung. The sum of the ages of all the three is 135 years. What is the age of each one of them?

Solution:

Let Baichung's father age be x years.

According to question, Baichung's age and his grandfather's age will be $(x - 29)$ and $(x + 26)$ years respectively.

Given sum of ages of all the three = 135 years

$$\Rightarrow (x - 29) + x + (x + 26) = 135$$

$$\Rightarrow 3x - 3 = 135$$

On transposing 3 to RHS, we get

$$\Rightarrow 3x = 135 + 3$$

$$\Rightarrow 3x = 138$$

On dividing both sides by 3

$$\Rightarrow \frac{3x}{3} = \frac{138}{3}$$

$$\Rightarrow x = 46$$

$$\text{Baichung age} = x - 29$$

$$= 46 - 29$$

$$= 17 \text{ years}$$

$$\text{Baichung's father age} = x = 46 \text{ years}$$

$$\text{Baichung's grandfather's age} = x + 26 = 46 + 26$$

$$= 72 \text{ years}$$

12. Fifteen years from now Ravi's age will be four times his present age. What is Ravi's present age?

Solution:

Let Ravi's present age be x years.

Fifteen years later, Ravi's age = $(x + 15)$ years

Given,

$$x + 15 = 4x$$

On transposing x to RHS, we get

$$\Rightarrow 15 = 4x - x$$

$$\Rightarrow 15 = 3x$$

Dividing 3 on both sides, we get

$$\Rightarrow \frac{15}{3} = \frac{3x}{3}$$

$$\Rightarrow 5 = x$$

Therefore, Ravi's present age = 5 years

13. A rational number is such that when you multiply it by $\frac{5}{2}$ and add $\frac{2}{3}$ to the product, you get $-\frac{7}{12}$. What is the number?

Solution:

Let the number be x

According to question,

$$\frac{5}{2}x + \frac{2}{3} = \frac{-7}{12}$$

on transposing $\frac{2}{3}$ to RHS, we get

$$\Rightarrow \frac{5}{2}x = \frac{-7}{12} - \frac{2}{3}$$

$$\Rightarrow \frac{5}{2}x = \frac{-15}{12}$$

On multiplying $\frac{2}{5}$ to both sides, we get

$$\Rightarrow x = \frac{-15}{12} \times \frac{2}{5}$$

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

Therefore, the rational number is $\frac{-1}{2}$

14. Lakshmi is a cashier in a bank. She has currency notes of denominations ₹ 100, ₹ 50 and ₹ 10, respectively. The ratio of the number of these notes is 2:3:5. The total cash with Lakshmi is ₹ 4,00,000. How many notes of each denomination does she have?

Solution:

Given currency notes are in the ratio 2:3:5

Let numbers of ₹ 100 notes, ₹ 50 notes, ₹ 10, notes will be $2x$, $3x$ and $5x$ respectively.

Amount of ₹ 100 notes = ₹ $(100 \times 2x)$

= ₹ $200x$

Amount of ₹ 50 notes = ₹ $(50 \times 3x)$ = ₹ $150x$

Amount of ₹ 10 notes = ₹ $(10 \times 5x)$ = ₹ $50x$

It is given that total amount is ₹ 400000

$$\Rightarrow 200x + 150x + 50x = 400000$$

$$\Rightarrow 400x = 400000$$

Dividing 400 to both sides, we get

$$\Rightarrow x = 1000$$

Number of ₹ 100 notes = $2x$

$$= 2 \times 1000$$

$$= 2000$$

Number of ₹ 50 notes = $3x$

$$= 3 \times 1000$$

$$= 3000$$

Number of ₹ 10 notes = $5x$

$$= 5 \times 1000$$

$$= 5000$$

15. I have a total of ₹ 300 in coins of denomination ₹ 1, ₹ 2 and ₹ 5. The number of ₹ 2 coins is 3 times the number of ₹ 5 coins. The total number of coins is 160. How many coins of each denomination are with me?

Solution:

Given total number of coins are 160.

Let the number of ₹ 5 coins be x .

Given Number of ₹ 2 coins = $3 \times$ number of ₹ 5 coins

$$= 3x$$

Number of ₹ 1 coins = $160 - (\text{number of coins of ₹ 5 and of ₹ 2})$

$$= 160 - (3x + x)$$

$$= 160 - 4x$$

Amount of ₹ 1 coins = $1 \times (160 - 4x)$

$$= ₹ (160 - 4x)$$

Amount of ₹ 2 coins = ₹ $(2 \times 3x)$

$$= ₹ 6x$$

Amount of ₹ 5 coins = ₹ $(5 \times x)$

$$= ₹ 5x$$

Given, $(160 - 4x) + 6x + 5x = 300$

$$160 + 7x = 300$$

on transposing 160 to RHS, we get

$$\Rightarrow 7x = 300 - 160$$

$$\Rightarrow 7x = 140$$

On dividing both sides by 7, we get

$$\Rightarrow x = \frac{140}{7}$$

$$\Rightarrow x = 20$$

Number of ₹ 5 coins = 20

Number of ₹ 1 coins = $160 - 4x = 160 - 4 \times 20$

$$= 160 - 80$$

$$= 80$$

Number of ₹ 2 coins = $3x = 3 \times 20 = 60$

16. The organisers of an essay competition decide that a winner in the competition gets a prize of ₹ 100 and a participant who does not win gets a prize of ₹ 25. The total prize money distributed is ₹ 3000. Find the number of winners, if the total number of participants is 63.

Solution:

Given total number of participants are 63

Let the number of winners be x

Therefore, the number of participants who did not win will be $63 - x$

Amount given to the winners = ₹ $(100 \times x)$

= ₹ $100x$

Amount given to the participants who did not win = ₹ $(25(63 - x))$

= ₹ $(1575 - 25x)$

Given, $100x + (1575 - 25x) = 3000$

$\Rightarrow 75x + 1575 = 3000$

On transposing 1575 to RHS, we get

$\Rightarrow 75x = 3000 - 1575$

$\Rightarrow 75x = 1425$

On dividing both sides by 75, we get

$\Rightarrow x = \frac{1425}{75}$

$\Rightarrow x = 19$

Therefore, the number of winners = 19

Exercise 2.3

1. Solve $3x = 2x + 18$ and check your results

Solution:

Given $3x = 2x + 18$

Transposing $2x$ to LHS

$\Rightarrow 3x - 2x = 18$

$\Rightarrow x = 18$

Verification:

L.H.S: R.H.S:

$3x$ $2x + 18$

Substituting $x = 18$,

$$3(18) = 54 \quad 2(18) + 18 = 54$$

Hence verified.

2. Solve $5t - 3 = 3t - 5$ and check your results

Solution:

Given $5t - 3 = 3t - 5$

Transposing $3t$ to LHS

$$\Rightarrow 5t - 3 - 3t = -5$$

$$\Rightarrow (5t - 3t) - 3 = -5$$

$$\Rightarrow 2t - 3 = -5$$

Transposing 3 to RHS

$$\Rightarrow 2t = -5 + 3$$

$$\Rightarrow 2t = -2$$

Divide by 2 on both sides

$$\Rightarrow \frac{2t}{2} = \frac{-2}{2}$$

$$\Rightarrow t = -1$$

Verification:

L.H.S:

$$5t - 3$$

$$= 5(-1) - 3$$

$$= -8$$

R.H.S:

$$3t - 5$$

$$= 3(-1) - 5$$

$$= -8$$

$$L.H.S=R.H.S$$

Hence verified.

3. Solve $5x + 9 = 5 + 3x$ and check your results

Solution:

Given $5x + 9 = 5 + 3x$

Transposing $3x$ to LHS

$$\Rightarrow 5x - 3x + 9 = 5$$

$$\Rightarrow 2x + 9 = 5$$

Transposing 9 to RHS

$$\Rightarrow 2x = 5 - 9$$

$$\Rightarrow 2x = -4$$

Dividing both sides by 2

$$\Rightarrow x = \frac{-4}{2}$$

$$\Rightarrow x = -2$$

Verification:

L.H.S:

$$5x + 9$$

$$= 5(-2) + 9$$

$$= -10 + 9$$

R.H.S:

$$5 + 3x$$

$$= 5 + 3(-2)$$

$$= 5 - 6$$

L.H.S=R.H.S

Hence verified.

4. Solve $4z + 3 = 6 + 2z$ and check your results

Solution:

Given $4z + 3 = 6 + 2z$

Transposing $2z$ to LHS

$$\Rightarrow 4z - 2z + 3 = 6$$

$$\Rightarrow 2z + 3 = 6$$

Transposing 3 to RHS

$$\Rightarrow 2z = 6 - 3$$

$$\Rightarrow 2z = 3$$

Dividing both sides by 2

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

Verification:

L.H.S:

$$4z + 3$$

$$= 4\left(\frac{3}{2}\right) + 3$$

$$= 6 + 3$$

$$= 9$$

R.H.S:

$$6 + 2z$$

$$= 6 + 2\left(\frac{3}{2}\right)$$

$$= 6 + 3$$

$$= 9$$

L.H.S=R.H.S

Hence verified.

5. Solve $2x - 1 = 14 - x$ and check your results

Solution:

Given $2x - 1 = 14 - x$

Adding x to both sides

$$\Rightarrow 2x + x - 1 = 14 - x + x$$

$$\Rightarrow 3x - 1 = 14$$

Adding 1 to both sides

$$\Rightarrow 3x - 1 + 1 = 14 + 1$$

$$\Rightarrow 3x = 15$$

Dividing both sides by 3

$$\Rightarrow x = \frac{15}{3}$$

$$\Rightarrow x = 5$$

Verification:

L.H.S:

$$2x - 1$$

$$= 2(5) - 1$$

$$= 9$$

R.H.S:

$$14 - x$$

$$= 14 - 5$$

$$= 9$$

L.H.S=R.H.S

Hence verified.

6. Solve $8x + 4 = 3(x - 1) + 7$ and check your results

Solution:

Given $8x + 4 = 3(x - 1) + 7$

$$\Rightarrow 8x + 4 = 3x - 3 + 7$$

$$\Rightarrow 8x + 4 = 3x + 4$$

Transposing $3x$ to LHS

$$\Rightarrow 8x - 3x + 4 = 4$$

$$\Rightarrow 5x + 4 = 4$$

Transposing 4 to RHS

$$\Rightarrow 5x = 4 - 4$$

$$\Rightarrow 5x = 0$$

$$\Rightarrow x = 0$$

Verification:

L.H.S:

$$8x + 4$$

$$= 8(0) + 4$$

$$= 4$$

R.H.S:

$$3(x - 1) + 7$$

$$= 3(0 - 1) + 7$$

$$= -3 + 7$$

$$= 4$$

L.H.S = R.H.S

Hence verified.

7. Solve $x = \frac{4}{5}(x + 10)$ and check your results

Solution:

Given $x = \frac{4}{5}(x + 10)$.

Multiplying both sides by 5

$$\Rightarrow 5x = 5 \times \frac{4}{5}(x + 10)$$

$$\Rightarrow 5x = 4(x + 10)$$

$$\Rightarrow 5x = 4x + 40$$

Transposing 4x to LHS

$$\Rightarrow 5x - 4x = 40$$

$$\Rightarrow x = 40$$

Verification:

L.H.S:

$$x = 40$$

R.H.S:

$$\frac{4}{5}(x + 10)$$

$$= \frac{4}{5}(40 + 10)$$

$$= \frac{4}{5}(50)$$

$$= 40$$

L.H.S = R.H.S

Hence verified.

8. Solve $\frac{2x}{3} + 1 = \frac{7x}{15} + 3$ and check your results

Solution:

Given $\frac{2x}{3} + 1 = \frac{7x}{15} + 3$

Multiply both sides by 15

$$\Rightarrow 15 \times \frac{2x}{3} + 15 = 15 \times \frac{7x}{15} + 3 \times 15$$

$$\Rightarrow 10x + 15 = 7x + 45$$

Transposing 7x to LHS

$$\Rightarrow 10x - 7x + 15 = 45$$

$$\Rightarrow 3x + 15 = 45$$

Subtract 15 from both sides

$$\Rightarrow 3x + 15 - 15 = 45 - 15$$

$$\Rightarrow 3x = 30$$

Divide by 3 on both sides

$$\Rightarrow \frac{3x}{3} = \frac{30}{3}$$

$$\Rightarrow x = 10$$

Verification:

L.H.S:

$$\frac{2x}{3} + 1$$

$$= \frac{2(10)}{3} + 1$$

$$= \frac{23}{3}$$

R.H.S:

$$\frac{7x}{15} + 3$$

$$= \frac{7(10)}{15} + 3$$

$$= \frac{14}{3} + 3$$

$$= \frac{23}{3}$$

L.H.S = R.H.S

Hence verified.

9. Solve $2y + \frac{5}{3} = \frac{26}{3} - y$ and check your results

Solution:

$$\text{Given } 2y + \frac{5}{3} = \frac{26}{3} - y$$

Adding y to both sides

$$\Rightarrow 2y + y + \frac{5}{3} = \frac{26}{3} - y + y$$

$$\Rightarrow 3y + \frac{5}{3} = \frac{26}{3}$$

Multiplying both sides by 3

$$\Rightarrow 3 \times 3y + 5 = 26$$

$$\Rightarrow 9y + 5 = 26$$

Transposing 5 to RHS

$$\Rightarrow 9y = 26 - 5$$

$$\Rightarrow 9y = 21$$

Dividing both sides by 9

$$\Rightarrow y = \frac{21}{9}$$

$$\Rightarrow y = \frac{7}{3}$$

Verification:

L.H.S:

$$2y + \frac{5}{3}$$

$$= 2\left(\frac{7}{3}\right) + \frac{5}{3}$$

$$= \frac{19}{3}$$

R.H.S:

$$\frac{26}{3} - y$$

$$= \frac{26}{3} - \frac{7}{3}$$

$$= \frac{19}{3}$$

L.H.S=R.H.S

Hence verified.

10. Solve $3m = 5m - \frac{8}{5}$ and check your results

Solution:

$$\text{Given } 3m = 5m - \frac{8}{5}$$

Transposing 3m to RHS

$$\Rightarrow 0 = 5m - 3m - \frac{8}{5}$$

$$\Rightarrow 0 = 2m - \frac{8}{5}$$

Adding $\frac{8}{5}$ to both sides

$$\Rightarrow \frac{8}{5} = 2m - \frac{8}{5} + \frac{8}{5}$$

$$\Rightarrow \frac{8}{5} = 2m$$

$$\Rightarrow 2m = \frac{8}{5}$$

Dividing both sides by 2

$$\Rightarrow m = \frac{8}{10}$$

$$\Rightarrow m = \frac{4}{5}$$

Verification:

L.H.S:

$$3m$$

$$= 3 \left(\frac{4}{5} \right)$$

$$= \frac{12}{5}$$

R.H.S:

$$5m - \frac{8}{5}$$

$$= 5 \left(\frac{4}{5} \right) - \frac{8}{5}$$

$$= \frac{12}{5}$$

L.H.S = R.H.S

Hence verified.

Exercise 2.4

1. Amina thinks of a number and subtract $\frac{5}{2}$ from it. She multiplies the result by 8. The result now obtained is 3 times the same number she thought of. What is the number?

Solution:

Let the number be x

According to given question,

$$8\left(x - \frac{5}{2}\right) = 3x$$

$$\Rightarrow 8x - 20 = 3x$$

$$\Rightarrow 8x - 3x = 20$$

$$\Rightarrow 5x = 20$$

$$\Rightarrow x = \frac{20}{5}$$

$$\Rightarrow x = 4$$

Therefore, the number she thought is 4.

2. A positive number is 5 times another number. If 21 is added to both the numbers, then one of the new numbers become twice the other new number. What are the numbers?

Solution:

Let the number be x , and $5x$

According to question,

$$21 + 5x = 2(x + 21)$$

$$\Rightarrow 21 + 5x = 2x + 42$$

Transposing $2x$ to LHS and 21 to RHS, we get

$$\Rightarrow 5x - 2x = 42 - 21$$

$$\Rightarrow 3x = 21$$

$$\Rightarrow x = \frac{21}{3}$$

$$\Rightarrow x = 7$$

Greater number = $5x$

$$= 5 \times 7$$

$$= 35$$

Therefore, the numbers are 7 and 35.

3. Sum of the digits of a two -digit number is 9. When we interchange the digits, it is found that the resulting new number is greater than the original number by 27. What is the two-digit number?

Solution:

Let the digits at tens place and ones place be x and $9 - x$ respectively.

Therefore, the original number = $10x + (9 - x)$

$$= 9x + 9$$

On interchanging the digits, the digits at ones place and tens place be x and $9 - x$ respectively.

Therefore, new number = $10(9 - x) + x$

$$= 90 - 9x$$

Given, new number = original number + 27

$$90 - 9x = 9x + 9 + 27$$

$$\Rightarrow 90 - 9x = 9x + 36$$

Transposing $9x$ to RHS and 36 to LHS, we get

$$\Rightarrow 90 - 36 = 9x + 9x$$

$$\Rightarrow 54 = 18x$$

$$\Rightarrow x = \frac{54}{18}$$

$$\Rightarrow x = 3$$

Digits at ones place = $9 - x$

$$= 9 - 3$$

$$= 6$$

Digit at tens place = x

$$= 3$$

Hence, two digit number = 36

4. One of the two digits of a two-digit number is three times the other digit. If you interchange the digits of this two digit number and add the resulting number to the original number, you get 88. What is the original number?

Solution:

Let the digits at tens place and ones place be x and $3x$ respectively.

Therefore, original number = $10x + 3x$

$$= 13x$$

On interchanging the digits, the digits at ones place and tens place will be x and $3x$ respectively.

New number = $10 \times 3x + x$

$$= 31x$$

Given, original number + new number = 88

$$\Rightarrow 13x + 31x = 88$$

$$\Rightarrow 44x = 88$$

On dividing both sides by 44

$$\Rightarrow x = \frac{88}{44}$$

$$\Rightarrow x = 2$$

Therefore, original number = $13x$

$$= 13 \times 2 = 26$$

By considering, the tens place and ones place be $3x$ and x respectively, the two digit number = 62.

Therefore, the two digit number may be 26 or 62.

5. Shobo's mother's present age is six times shobo's present age. Shobo's age five years from now will be one third of his mother's present age. What are their present ages?

Solution:

Let shobo's present age be x years.

And shobo's mother present age = $6x$ years

According to question,

$$x + 5 = \frac{1}{3} \times 6x$$

$$\Rightarrow x + 5 = 2x$$

$$\Rightarrow 2x = x + 5$$

$$\Rightarrow 2x - x = 5$$

$$\Rightarrow x = 5$$

shobo's mother present age = $6x$ years

$$= 6 \times 5 = 30 \text{ years.}$$

Hence, Shobo present age = 5 years and Shobo's mother present age = 30 years.

6. There is a narrow rectangular plot, reserved for a school, in Mahuli village. The length and breadth of the plot are in the ratio 11: 4. At the rate ₹ 100 per meter it will cost the village panchayat ₹ 75000 to fence the plot. What are the dimensions of the plot?

Solution:

Let the length and breadth of the rectangular plot be $11x$ and $4x$ respectively.

$$\text{Perimeter of the plot} = \frac{\text{Total cost}}{\text{cost of 1 meter}}$$

$$= \frac{75000}{100} = 750\text{m}$$

We know that, perimeter of rectangle = $2(l + b)$

$$\Rightarrow 2(11x + 4x) = 750$$

$$\Rightarrow 30x = 750$$

$$\Rightarrow x = \frac{750}{30}$$

$$\Rightarrow x = 25$$

Hence, length of rectangular plot = 11×25

$$= 275 \text{ m}$$

Breadth of rectangular plot = $4x$

$$= 4 \times 25$$

$$= 100 \text{ m}$$

Therefore, the length and breadth of the plot are 275m and 100m respectively.

7. Hasan buys two kinds of cloth materials for school uniforms, shirt materials that costs him ₹ 50 per meter and trouser material that costs him ₹ 90 per metre. For every 3 meters of the shirt material he buys 2 meters of the trouser material. He sells the materials at 12% and 10% profit respectively. His total sell is ₹ 36600 . How much trouser material did he buy?

Solution:

Let the shirt material and trouser material he bought be $3x, 2x$ respectively.

The cost of shirt material = $50 \times 3x$

$$= ₹150x$$

The selling price at 12% gain = $\frac{100+p\%}{100} \times \text{C. P.}$

$$= \frac{100 + 12}{100} \times 150x$$

$$= \frac{112}{100} \times 150x = ₹168x$$

The cost of trouser material = $90 \times 2x$

$$= ₹180x$$

The selling price at 10% gain = $\frac{100+p\%}{100} \times \text{C. P.}$

$$= \frac{100 + 10}{100} \times 180x$$

$$= \frac{110}{100} \times 180x = ₹198x$$

According to question,

$$168x + 198x = 36600$$

$$366x = 36600$$

$$x = \frac{36600}{366} = 100$$

$$\text{Now, trouser material} = 2x = 2 \times 100$$

$$= 200 \text{ meters}$$

Hence, Hasan bought 200m trouser material.

8. Half of a herd of deer are grazing in the field and three fourths of the remaining are playing nearby. The rest 9 are drinking water from the pond. Find the number of deer in the herd.

Solution:

Let the total number of deer in the herd be x .

According to question,

$$x = \frac{x}{2} + \frac{3}{4} \times \left(x - \frac{x}{2}\right) + 9$$

$$\Rightarrow x = \frac{x}{2} + \frac{3x}{8} + 9$$

$$\Rightarrow x = \frac{7x}{8} + 9$$

$$\Rightarrow x - \frac{7x}{8} = 9$$

$$\Rightarrow \frac{x}{8} = 9$$

$$\Rightarrow x = 9 \times 8$$

$$\Rightarrow x = 72$$

Hence, the total number of deer in the herd is 72.

9. A grandfather is ten times older than his granddaughter. He is also 54 years older than her. Find their present ages.

Solution:

Let present age of granddaughter be x years.

Therefore, grandfather's age = $10x$ years.

According to question.

$$10x = x + 54$$

$$\Rightarrow 9x = 54$$

$$\Rightarrow x = \frac{54}{9}$$

$$\Rightarrow x = 6$$

Granddaughter's present age = 6 years.

And Grandfather's present age = $10x = 10 \times 6 = 60$ years.

Hence, granddaughter's present age is 6 years and Grandfather's present age is 60 years.

10. Aman's age is three times his son's age. Ten years ago he was five times his son's age. Find their present ages.

Solution:

Let the present age of Aman's son's be x years.

Therefore, Aman's age = $3x$ years

According to question,

$$\Rightarrow 3x - 10 = 5(x - 10)$$

$$\Rightarrow 3x - 10 = 5x - 50$$

$$\Rightarrow 50 - 10 = 5x - 3x$$

$$\Rightarrow 40 = 2x$$

$$\Rightarrow x = \frac{40}{2} = 20 \text{ years.}$$

Hence, Aman's son's age = 20 years and Aman's age = $3x = 3 \times 20 = 60$ years.

Exercise 2.5

1. Solve the linear equation $\frac{x}{2} - \frac{1}{5} = \frac{x}{3} + \frac{1}{4}$

Solution:

$$\text{Given } \frac{x}{2} - \frac{1}{5} = \frac{x}{3} + \frac{1}{4}$$

Multiplying both sides of the equations by 6

$$\Rightarrow 6 \times \frac{x}{2} - 6 \times \frac{1}{5} = 6 \times \frac{x}{3} + 6 \times \frac{1}{4}$$

$$\Rightarrow 3x - \frac{6}{5} = 2x + \frac{3}{2}$$

Transposing $2x$ to LHS

$$\Rightarrow 3x - 2x - \frac{6}{5} = \frac{3}{2}$$

$$\Rightarrow x - \frac{6}{5} = \frac{3}{2}$$

Adding $\frac{6}{5}$ to both sides

$$\Rightarrow x - \frac{6}{5} + \frac{6}{5} = \frac{3}{2} + \frac{6}{5}$$

$$\Rightarrow x = \frac{15 + 12}{10}$$

$$\Rightarrow x = \frac{27}{10}$$

2. Solve the linear equation $\frac{n}{2} - \frac{3n}{4} + \frac{5n}{6} = 21$

Solution:

$$\text{Given } \frac{n}{2} - \frac{3n}{4} + \frac{5n}{6} = 21$$

Multiplying both sides by 12.

$$\Rightarrow 12 \times \frac{n}{2} - 12 \times \frac{3n}{4} + 12 \times \frac{5n}{6} = 12 \times 21$$

$$\Rightarrow 6n - 9n + 10n = 252$$

$$\Rightarrow 7n = 252$$

$$\Rightarrow n = \frac{252}{7}$$

$$n = 36$$

3. Solve the linear equation $x + 7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$

Solution:

$$\text{Given } x + 7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$$

Multiplying both side by 6.

$$\Rightarrow 6(x + 7) - 6 \times \frac{8x}{3} = 6 \times \frac{17}{6} - 6 \times \frac{5x}{2}$$

$$\Rightarrow 6x + 42 - 16x = 17 - 15x$$

$$\Rightarrow 42 - 10x = 17 - 15x$$

Adding 15x to both sides

$$\Rightarrow 42 - 10x + 15x = 17 - 15x + 15x$$

$$\Rightarrow 5x + 42 = 17$$

Transposing 42 to RHS

$$\Rightarrow 5x = 17 - 42$$

$$\Rightarrow 5x = -25$$

Dividing both sides by 5

$$\Rightarrow x = \frac{-25}{5}$$

$$x = -5$$

4. Solve the linear equation $\frac{x-5}{3} = \frac{x-3}{5}$

Solution:

$$\text{Given } \frac{x-5}{3} = \frac{x-3}{5}$$

Multiplying both sides by 15

$$\Rightarrow \frac{15(x-5)}{3} = \frac{15(x-3)}{5}$$

$$\Rightarrow 5(x-5) = 3(x-3)$$

$$\Rightarrow 5x - 25 = 3x - 9$$

Transposing 3x to LHS

$$\Rightarrow 5x - 3x - 25 = -9$$

$$\Rightarrow 2x - 25 = -9$$

Adding 25 to both sides

$$\Rightarrow 2x - 25 + 25 = -9 + 25$$

$$\Rightarrow 2x = 16$$

Dividing both sides by 2

$$\Rightarrow x = \frac{16}{2}$$

$$\Rightarrow x = 8$$

5. Solve the linear equation $\frac{3t-2}{4} - \frac{2t+3}{3} = \frac{2}{3} - t$

Solution:

$$\text{Given } \frac{3t-2}{4} - \frac{2t+3}{3} = \frac{2}{3} - t$$

Multiplying both sides by 12

$$\Rightarrow 12\left(\frac{3t-2}{4}\right) - 12\left(\frac{2t+3}{3}\right) = 12 \times \frac{2}{3} - 12t$$

$$\Rightarrow 3(3t-2) - 4(2t+3) = 4 \times 2 - 12t$$

$$\Rightarrow 9t - 6 - 8t - 12 = 8 - 12t$$

$$\Rightarrow t - 18 = 8 - 12t$$

Adding $12t$ to both sides

$$\Rightarrow t + 12t - 18 = 8 - 12t + 12t$$

$$\Rightarrow 13t - 18 = 8$$

Adding 18 to both sides

$$\Rightarrow 13t - 18 + 18 = 8 + 18$$

$$\Rightarrow 13t = 26$$

$$\Rightarrow t = \frac{26}{13} = 2$$

6. Solve the linear equation $m - \frac{m-1}{2} = 1 - \frac{m-2}{3}$

Solution:

Given $m - \frac{m-1}{2} = 1 - \frac{m-2}{3}$

Multiplying both sides by 6

$$\Rightarrow 6m - \frac{6(m-1)}{2} = 6 - 6 \frac{(m-2)}{3}$$

$$\Rightarrow 6m - 3(m-1) = 6 - 2(m-2)$$

$$\Rightarrow 6m - 3m + 3 = 6 - 2m + 4$$

$$\Rightarrow 3m + 3 = 10 - 2m$$

Adding $2m$ to both sides

$$\Rightarrow 3m + 2m + 3 = 10 - 2m + 2m$$

$$\Rightarrow 5m + 3 = 10$$

Transposing 3 to RHS

$$\Rightarrow 5m = 10 - 3$$

$$\Rightarrow 5m = 7$$

$$\Rightarrow m = \frac{7}{5}$$

7. Simplify and solve the linear equation $3(t-3) = 5(2t+1)$

Solution:

Given $3(t-3) = 5(2t+1)$

$$\Rightarrow 3t - 9 = 10t + 5$$

Transposing $3t$ to RHS

$$\Rightarrow -9 = 10t - 3t + 5$$

$$\Rightarrow 7t + 5 = -9$$

Transposing 5 to RHS

$$\Rightarrow 7t = -9 - 5$$

$$\Rightarrow 7t = -14$$

$$\Rightarrow t = \frac{-14}{7}$$

$$\Rightarrow t = -2$$

8. Simplify and solve the linear equation $15(y - 4) - 2(y - 9) + 5(y + 6) = 0$

Solution:

Given $15(y - 4) - 2(y - 9) + 5(y + 6) = 0$

$$\Rightarrow 15y - 60 - 2y + 18 + 5y + 30 = 0$$

$$\Rightarrow 18y - 12 = 0$$

Adding 12 to both sides

$$\Rightarrow 18y - 12 + 12 = 12$$

$$\Rightarrow 18y = 12$$

$$\Rightarrow y = \frac{12}{18}$$

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

9. Simplify and solve the linear equation $3(5z - 7) - 2(9z - 11) = 4(8z - 13) - 17$

Solution:

Given $3(5z - 7) - 2(9z - 11) = 4(8z - 13) - 17$

$$\Rightarrow 15z - 21 - 18z + 22 = 32z - 52 - 17$$

$$\Rightarrow -3z + 1 = 32z - 69$$

Adding 3z to both sides

$$\Rightarrow -3z + 3z + 1 = 32z + 3z - 69$$

$$\Rightarrow 1 = 35z - 69$$

Adding 69 to both sides

$$\Rightarrow 1 + 69 = 35z - 69 + 69$$

$$\Rightarrow 70 = 35z$$

Diving 35 to both sides

$$\Rightarrow \frac{70}{35} = z$$

$$\Rightarrow z = 2$$

10. Simplify and solve the linear equation $0.25(4f - 3) = 0.05(10f - 9)$

Solution:

Given $0.25(4f - 3) = 0.05(10f - 9)$

$$\Rightarrow f - 0.75 = 0.5f - 0.45$$

On transposing $0.5f$ to LHS

$$\Rightarrow f - 0.5f - 0.75 = -0.45$$

$$\Rightarrow 0.5f - 0.75 = -0.45$$

Adding 0.75 to both sides

$$\Rightarrow 0.5f - 0.75 + 0.75 = -0.45 + 0.75$$

$$\Rightarrow 0.5f = 0.30$$

$$\Rightarrow f = \frac{0.30}{0.50}$$

$$\Rightarrow f = \frac{3}{5}$$

Exercise 2.6

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

Solution:

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

Multiplying $3x$ to both sides

$$\Rightarrow \left(\frac{8x-3}{3x}\right) \times 3x = 2 \times 3x$$

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

Transposing $6x$ to LHS

$$\Rightarrow 8x - 6x - 3 = 0$$

$$\Rightarrow 2x - 3 = 0$$

Adding 3 to both sides

$$\Rightarrow 2x = 3$$

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

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

Solution:

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

Multiplying both sides by $7 - 6x$

$$\Rightarrow \left(\frac{9x}{7-6x}\right) \times (7-6x) = 15 \times (7-6x)$$

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

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

$$\Rightarrow 99x = 105$$

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

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

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

Solution:

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

Multiplying $(z + 15)$ to both sides

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

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

Multiplying 9 to both sides

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

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

Transposing $4z$ to LHS

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

$$\Rightarrow 5z = 60$$

$$\Rightarrow z = 12$$

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

Solution:

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

Multiplying $(2 - 6y)$ to both sides

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

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

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

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

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

$$\Rightarrow 3y + 20 = -4$$

$$\Rightarrow 3y = -24$$

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

$$\Rightarrow y = -8$$

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

Solution:

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

Multiplying $(y + 2)$ to both sides

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

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

Multiplying 3 to both sides

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

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

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

$$\Rightarrow 25y = -20$$

$$\Rightarrow y = \frac{-20}{25}$$

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

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

Solution:

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

After 4 years,

$$\text{Hari's age} = 5x + 4$$

$$\text{Harry's age} = 7x + 4$$

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

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

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

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

$$\Rightarrow 4 = x$$

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

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

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

Solution:

Let the numerator of rational number be x

Given Denominator is greater than numerator by 8 .

Then, denominator = $x + 8$

If numerator = $x + 17$,

Then denominator = $x + 8 - 1$

$$= x + 7$$

$$\text{Given Number} = \frac{3}{2}$$

$$\text{i.e., } \frac{x+17}{x+7} = \frac{3}{2}$$

on cross multiplying

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

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

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

$$\Rightarrow 13 = x$$

Hence, numerator = 13

Denominator = $13 + 8$

$$= 21$$

Therefore, Number is $\frac{13}{21}$

