## Exercise 6(G)

### Solution 1:

Let Rohit has Rs. x
and Ajay has Rs. y
When Ajay gives Rs. 100 to Rohit
$x + 100 = 2(y - 100)$
$x - 2y = -300$...(1)
When Rohit gives Rs. 10 to Ajay
$6(x-10) = y + 10$
$6x - y = 70$...(2)
Multiplying equation no. (2) By 2.

$$12x - 2y = 140 \quad \ldots(3)$$

$$x - 2y = -300$$

$$- \quad + \quad +$$

$$11x = 440$$

$x = 40$

From (1)
$40 - 2y = -300$
$\Rightarrow -2y = -340$
$\Rightarrow y = 170$

Thus, Rohit has Rs. 40
and Ajay has Rs. 170

**Solution 2:**

Let the digits in the tens place be x and the digit in the units place be y.

$\therefore$ Number $= 10x + y$

Number on reversing the digits $= 10y + x$

The difference between the digits $= x - y$ or $y - x$

Given : $(10x + y) + (10y + x) = 99$

$\Rightarrow 11x + 11y = 99$

$\Rightarrow x + y = 9 \ldots\ldots (i)$

$x - y = 3 \ldots\ldots (ii)$

or $y - x = 3 \ldots\ldots (iii)$

On solving equations (i) and (ii), we get

$2x = 12 \Rightarrow x = 6$

So, $y = 3$

On solving equations (i) and (iii), we get

$2y = 12 \Rightarrow y = 6$

So, $x = 3$

Number $= 10x + y = 10(6) + 3 = 63$

or Number $= 10x + y = 10(3) + 6 = 36$

$\therefore$ Required number $= 63$ or $36$.



**Solution 3:**

3Let the digit at ten's place be x

And the digit at unit's place be y

Required number = 10x + y

When the digits are interchanged,

Reversed number = 10y + x

According to the question,

7(10x + y) = 4(10y + x)

66x = 33y

2x - y = 0...(1)

Also,

$$\begin{array}{rl} y - x = 3 & \ldots(2) \\ -y + 2x = 0 & \ldots(1) \\ \hline x = 3 & \end{array}$$

From (1) 2(3) - y = 0

y = 6

Thus, Required number = 10(3) + 6 = 36

**Solution 4:**

Let, the fare of ticket for station A be Rs. x
and the fare of ticket for station B be Rs. y
According, to the question
2x + 3y = 77....(1)
and3x+5y = 124...(2)
Multiplying equation no. (1) by 3 and (2) by 2.

$$6x + 9y = 231 \quad \ldots(1)$$
$$6x + 10y = 248 \quad \ldots(4)$$
$$- \quad - \quad -$$
$$-y = -17$$

y = 17
From (1) 2x + 3 (17) = 77
2x = 77 - 51
2x = 26
x = 13
Thus, fare for station A = Rs. 13
and, fare for station B = Rs. 17.

**Solution 5:**

Let x be the number at the ten's place
and y be the number at the unit's place.
So the number is 10x + y.

The sum of digit of a two digit number is 11.
$\Rightarrow x + y = 11 \ldots\ldots\ldots\ldots\ldots\ldots (i)$

If the digit at ten's place is increased by 5
and the digit at unit place is decreased by 5,
the digits of the number are found to be reversed.
$\Rightarrow 10(x + 5) + (y - 5) = 10y + x$
$\Rightarrow 9x - 9y = -45$
$\Rightarrow x - y = -5 \ldots\ldots\ldots\ldots\ldots\ldots (ii)$

Subtracting equation $(i)$ from equation $(ii)$, we get:

$$x - y = -5$$
$$x + y = 11 \qquad \text{[Equation } (i)\text{]}$$
$$- \quad - \quad - \qquad \text{[Subtracting]}$$
$$-2y = -16$$

$\Rightarrow y = 8$

Substituting $y = 8$ in equation (i), we get
$x + 8 = 11$
$\Rightarrow x = 3$

$\therefore$ The number is $10x + y = 10(3) + 8 = 38$.

**Solution 6:**

Let the quantity of 90% acid solution be x litres and
The quantity of 97% acid solution be y litres
According to the question,
x + y = 21...(1)
and 90% of x + 97% of y = 95% of 21
90x + 97y = 1995...(2)
Multiplying equation no. (1) by90, we get,

$$90x + 90y = 1890 \quad \ldots(3)$$
$$90x + 97y = 1995 \quad \ldots(2)$$
$$- \quad - \quad +$$
$$-7y = -105$$
$$y = 15$$

From (1)x + 15 = 21
x = 6
Hence, 90% acid solution is 6 litres and 97% acid solution is 15 litres.

**Solution 7:**

Assume x kg of the first kind costing Rs. 250 per kg and y kg of the second kind costing Rs. 350 per kg sweets were bought.

It is estimated that 40 kg of sweets were needed.
$\Rightarrow x + y = 40 \ldots\ldots\ldots\ldots\ldots\ldots (i)$

The total budget for the sweets was Rs. 11,800.
$\Rightarrow 250x + 350y = 11,800 \ldots\ldots\ldots\ldots\ldots\ldots (ii)$

Multiply equation $(i)$by 250, we get:

$$250x + 250y = 10000$$
$$250x + 350y = 11,800 \quad \text{[Equation } (ii)\text{]}$$
$$- \quad - \quad - \quad \text{[Subtracting]}$$
$$-100y = -1800$$
$$\Rightarrow y = 18$$

Substituting $y = 18$ in equation (i), we get
$x + 18 = 40$
$\Rightarrow x = 22$

$\therefore$ 22 kgs of the first kind costing Rs. 250 per kg and 18 kgs of the second kind costing Rs. 350 per kg sweets were bought.

## Solution 8:

Weight of Mr. Ahuja = x kg
and weight of Mrs. Ahuja = y kg.
After the dieting,
$x - 5 = y$
$x - y = 5$...(1)
and, $y - 4 = \frac{7}{8}x$
$7x - 8y = -32$...(2)
Multiplying equation no. (1) by 7, we get

$$7x - 7y = 35 \quad \ldots(3)$$

Now subtracting (2) from (3)

$$7x - 7y = 35 \quad \ldots(3)$$
$$7x - 8y = -32 \quad \ldots(2)$$
$$- \quad + \quad +$$
$$y = 67$$

From (1)
$x - 67 = 5 \Rightarrow x = 72$
Thus, weight of Mr. Ahuja = 72 kg.
and that of Mr. Anuja = 67 kg.

## Solution 9:

Let x be the constant expense per month of the family.
and y be the expense per month for a single member of the family.

For a family of 4 people,
the total monthly expense is Rs. 10,400.
$\Rightarrow x + 4y = 10,400 \ldots\ldots\ldots\ldots\ldots\ldots (i)$

For a family of 7 people,
the total monthly expense is Rs. 15,800.
$\Rightarrow x + 7y = 15,800 \ldots\ldots\ldots\ldots\ldots\ldots (ii)$

Subtracting equation $(i)$ from equation $(ii)$, we get:

$$x + 7y = 15800$$
$$x + 4y = 10400 \qquad \text{[Equation } (i)\text{]}$$
$$- \quad - \quad - \qquad \text{[Subtracting]}$$
$$3y = 5400$$
$$\Rightarrow y = 1800$$

Substituting $y = 1800$ in equation (i), we get
$x + 4(1800) = 10,400$
$\Rightarrow x = 3200$

$\therefore$ The constant expense is Rs. 3,200 per month and
the monthly expense of each member of a family is Rs. 1,800.

**Solution 10:**

Let the fixed charge be Rs. x and the charge per kilometer be Rs. y.

The charges for 10 km = Rs. 10y

The charges for 15 km = Rs. 15y

According to the question,

$x + 10y = 315$.....(i)

$x + 15y = 465$.....(ii)

Solving the equations, we get

$-5y = -150 \Rightarrow y = 30$

and $x = 315 - 10y = 315 - 10(30) = 15$

So, the fixed charges is Rs. 15 and the charges per kilometer is Rs. 30.

To travel 32 km, a person has to pay

Rs. 15 + Rs. 30(32) = Rs. 15 + Rs. 960 = Rs. 975

**Solution 11:**

Let the fixed charges be Rs. x and the charge for each extra day be Rs. y.

According to the question,

$x + 4y = 27$.....(i)

and $x + 2y = 21$.....(ii)

Solving the equations, we get

$2y = 6 \Rightarrow y = 3$

and $x = 21 - 2y = 21 - 2(3) = 15$

Hence, the fixed charges is Rs. 15 and the charge for each extra day is Rs. 3.

**Solution 12:**

Let the length of the rectangle be x units and the breadth of the rectangle be y units.
We know that, area of a rectangle = length x breadth = xy
According to the question,
$xy - 9 = (x - 5)(y + 3)$
$\Rightarrow xy - 9 = xy + 3x - 5y - 15$
$\Rightarrow 3x - 5y = 6 \ldots\ldots (i)$
$xy + 67 = (x + 3)(y + 2)$
$\Rightarrow xy + 67 = xy + 2x + 3y + 6$
$\Rightarrow 2x + 3y = 61 \ldots\ldots (ii)$
Multiply (i) by 2 and (ii) by 3, we get
$6x - 10y = 12 \ldots (iii)$
and $6x + 9y = 183 \ldots (iv)$
Solving (iii) and (iv), we get
$-19y = -171 \Rightarrow y = 9$
and $x = 17$
Hence, the length of the rectangle is 17 units and the breadth of the rectangle is 9 units.

**Solution 13:**

Let the pipe with larger diameter and smaller diameter be pipes A and B respectively.
Also, let pipe A work at a rate of x hours / unit and pipe B work at a rate of y hours / unit.
According to the question,

$$x + y = \frac{1}{12} \Rightarrow 12x + 12y = 1 \ldots\ldots (i)$$

$$\text{and } 4x + 9y = \frac{1}{2} \Rightarrow 8x + 18y = 1 \ldots\ldots (ii)$$

Multiply (i) by 2 and (ii) by 3, we get
$24x + 24y = 2$ and $24x + 54y = 3$

$$\text{On solving we get, } 30y = 1 \Rightarrow y = \frac{1}{30}$$

$$\text{and } x = \frac{1}{20}$$

Hence, the pipe with larger diameter will take 20 hours to fill the swimming pool and the pipe with smaller diameter will take 30 hours to fill the swimming pool.