

## Pair of Linear Equations in Two varibles Ex 3.7 Q9

## Answer:

Let the digits at units and tens place of the given number be x and y respectively. Thus, the number is 10y + x.

The number is 3 more than 4 times the sum of the two digits. Thus, we have

10y + x = 4(x + y) + 3

 $\Rightarrow$  10y + x = 4x + 4y + 3

 $\Rightarrow 4x + 4y - 10y - x = -3$ 

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

 $\Rightarrow$  3(x-2y) = -3

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

 $\Rightarrow x - 2y = -1$ 

After interchanging the digits, the number becomes 10x + y

If 18 is added to the number, the digits are reversed. Thus, we have

(10y+x)+18=10x+y

 $\Rightarrow$  10x + y - 10y - x = 18

 $\Rightarrow 9x - 9y = 18$ 

 $\Rightarrow$  9(x-y)=18

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 $\Rightarrow x - y = 2$ 

So, we have the systems of equations

x-2y=-1,

x-y=2

Here x and y are unknowns. We have to solve the above systems of equations for x and y.

Subtracting the first equation from the second, we have

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

 $\Rightarrow x - y - x + 2y = 3$ 

 $\Rightarrow y = 3$ 

Substituting the value of y in the first equation, we have

 $x-2\times 3=-1$ 

 $\Rightarrow x-6=-1$ 

 $\Rightarrow x = -1 + 6$ 

 $\Rightarrow x = 5$ 

Hence, the number is  $10 \times 3 + 5 = \boxed{35}$ 

## Pair of Linear Equations in Two varibles Ex 3.7 Q10

Let the digits at units and tens place of the given number be x and y respectively. Thus, the number is 10y + x.

The number is 4 more than 6 times the sum of the two digits. Thus, we have

10y + x = 6(x + y) + 4

 $\Rightarrow$  10 y + x = 6x + 6y + 4

 $\Rightarrow$  6x + 6y - 10y - x = -4

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

After interchanging the digits, the number becomes 10x + y.

If 18 is subtracted from the number, the digits are reversed. Thus, we have

(10y+x)-18=10x+y

 $\Rightarrow 10x + y - 10y - x = -18$ 

 $\Rightarrow 9x - 9y = -18$ 

 $\Rightarrow 9(x-y) = -18$ 

 $\Rightarrow x - y = -\frac{1}{6}$ 

 $\Rightarrow r - v = -2$ 

So, we have the systems of equations

$$5x - 4y = -4,$$

$$x-y=-2$$

Here x and y are unknowns. We have to solve the above systems of equations for x and y. Multiplying the second equation by 5 and then subtracting from the first, we have

$$(5x-4y)-(5x-5y)=-4-(-2\times5)$$

$$\Rightarrow 5x - 4y - 5x + 5y = -4 + 10$$

$$\Rightarrow y = 6$$

Substituting the value of y in the second equation, we have

$$x - 6 = -2$$

$$\Rightarrow x = 6 - 2$$

$$\Rightarrow x = 4$$

Hence, the number is  $10 \times 6 + 4 = \boxed{64}$ 

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