



Pair of Linear Equations in Two variables Ex 3.7 Q5

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 two digits of the number are differing by 2. Thus, we have $x - y = \pm 2$

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

The sum of the numbers obtained by interchanging the digits and the original number is 66. Thus, we have

$$(10x + y) + (10y + x) = 66$$

$$\Rightarrow 10x + y + 10y + x = 66$$

$$\Rightarrow 11x + 11y = 66$$

$$\Rightarrow 11(x + y) = 66$$

$$\Rightarrow x + y = \frac{66}{11}$$

$$\Rightarrow x + y = 6$$

So, we have two systems of simultaneous equations

$$x - y = 2,$$

$$x + y = 6$$

$$x - y = -2,$$

$$x + y = 6$$

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

(i) First, we solve the system

$$x - y = 2,$$

$$x + y = 6$$

Adding the two equations, we have

$$(x - y) + (x + y) = 2 + 6$$

$$\Rightarrow x - y + x + y = 8$$

$$\Rightarrow 2x = 8$$

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

$$\Rightarrow x = 4$$

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

$$4 - y = 2$$

$$\Rightarrow y = 4 - 2$$

$$\Rightarrow y = 2$$

Hence, the number is $10 \times 2 + 4 = \boxed{24}$.

(ii) Now, we solve the system

$$x - y = -2,$$

$$x + y = 6$$

Adding the two equations, we have

$$(x - y) + (x + y) = -2 + 6$$

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

$$\Rightarrow 2x = 4$$

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

$$\Rightarrow x = 2$$

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

$$2 - y = -2$$

$$\Rightarrow y = 2 + 2$$

$$\Rightarrow y = 4$$

Hence, the number is $10 \times 4 + 2 = \boxed{42}$.

There are two such numbers.

Pair of Linear Equations in Two variables Ex 3.7 Q6

Answer :

Let the numbers are x and y . One of them must be greater than or equal to the other. Let us assume that x is greater than or equal to y .

The sum of the two numbers is 1000. Thus, we have $x + y = 1000$

The difference between the squares of the two numbers is 256000. Thus, we have

$$x^2 - y^2 = 256000$$

$$\Rightarrow (x + y)(x - y) = 256000$$

$$\Rightarrow 1000(x - y) = 256000$$

$$\Rightarrow x - y = \frac{256000}{1000}$$

$$\Rightarrow x - y = 256$$

So, we have two equations

$$x + y = 1000$$

$$x - y = 256$$

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

Adding the two equations, we have

$$(x + y) + (x - y) = 1000 + 256$$

$$\Rightarrow x + y + x - y = 1256$$

$$\Rightarrow 2x = 1256$$

$$\Rightarrow x = \frac{1256}{2}$$

$$\Rightarrow x = \boxed{628}$$

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

$$628 + y = 1000$$

$$\Rightarrow y = 1000 - 628$$

$$\Rightarrow y = \boxed{372}$$

Hence, the numbers are 628 and 372.

***** END *****