



Pair of Linear Equations in Two variables Ex 3.11 Q20

Answer :

Let the number of students be x and the number of row be y .then,

$$\text{Number of students in each row} = \frac{x}{y}$$

Where three students is extra in each row, there are one row less that is when each row has $\left(\frac{x}{y} + 3\right)$

students the number of rows is $(y-1)$

Total number of students =no. of rows \times no. of students in each row

$$x = \left(\frac{x}{y} + 3\right)(y-1)$$

$$x = \left(x + 3y - \frac{x}{y} - 3\right)$$

$$0 = \frac{-x}{y} + x - x + 3y - 3$$

$$0 = \frac{-x}{y} + \cancel{x} - \cancel{x} + 3y - 3$$

$$0 = \frac{-x}{y} + 3y - 3$$

If three students are less in each row then there are 2 rows more that is when each row has

$$\left(\frac{x}{y} - 3\right)(y+2)$$

Therefore, total number of students=Number of rows \times Number of students in each row

$$x = \left(\frac{x}{y} - 3\right)(y+2)$$

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

$$0 = \frac{2x}{y} + x - x - 3y - 6$$

$$0 = \frac{2x}{y} + \cancel{x} - \cancel{x} - 3y - 6$$

$$0 = \frac{2x}{y} - 3y - 6 \dots (ii)$$

Putting $\frac{x}{y} = u$ in (i) and (ii) equation we get

$$-u + 3y - 3 = 0 \dots (iii)$$

$$2u - 3y - 6 = 0 \dots (iv)$$

Adding (iii) and (iv) equation we get

$$-u + \cancel{3y} - 3 = 0$$

$$2u - \cancel{3y} - 6 = 0$$

$$\hline u - 9 = 0$$

$$u = 9$$

Putting $u = 9$ in equation (iii) we get

$$-u + 3y - 3 = 0$$

$$-9 + 3y - 3 = 0$$

$$+3y - 12 = 0$$

$$3y = 12$$

$$y = \frac{12}{3}$$

$$y = 4$$

$$u = 9$$

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

$$\frac{x}{4} = 9$$

$$x = 9 \times 4$$

$$x = 36$$

Hence, the number of students in the class is 36.

***** END *****