Name: K.Saisusmitha
Batch: COMETFWC018
Date: 16 May 2025

PAIR OF LINEAR EQUATIONS In TWO VARIABLES

Example 6: In a shop the cost of 2 pencils and 3 erasers is 9 and the cost of 4 pencils and 6 erasers is 18. Find the cost of each pencil and each eraser.

Solution : The pair of linear equations formed were:

$$2x+3y=9 \tag{1}$$
$$4x+6y=18 \tag{2}$$

We first express the value of x in terms of y from Equation (1), to get

$$x=\frac{9-3y}{2} \tag{3}$$

Now we substitute this value of x in Equation (2), to get

$$\begin{aligned} 4\left(\frac{9-3y}{2}\right)+6y &= 18 \\ 18-6y+6y &= 18 \\ \Rightarrow 18 &= 18 \end{aligned}$$

This statement is true for all values of y. However, we do not get a specific value of y as a solution. Therefore, we cannot obtain a specific value of x. This situation has arisen because both the given equations are the same.Therefore, Equations (1) and (2) have infinitely many solutions. We cannot find a unique cost of a pencil and an eraser, because there are many common solutions to the given situation.

Example 7: Two rails are represented by the equations: [x + 2y - 4 = 0 and 2x + 4y - 12 = 0.] Will the rails cross each other?

Solution : The pair of linear equations formed were:

$$x+2y-4=0 \tag{1}$$
$$2x+4y-12=0 \tag{2}$$

We express x in terms of y from Equation (1), to get

$$x=4-2y$$

Now, we substitute this value of x in Equation (2), to get

$$\begin{aligned} 2(4-2y)+4y-12 &= 0 \\ 8-4y+4y-12 &= 0 \\ -4 &= 0 \end{aligned}$$

Which is False statement.
Therefore, the equations do not have a common solution. So, the two rails will not cross each other.