

Pair of Linear Equations in Two Variables

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Class 10th Maths - Chapter 3

This is Problem-1.1 from Exercise 3.2

1. 10 students of Class X took part in a mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.

Solution:

Let number of boys be x and number of girls be y .

$$x + y = 10$$

$$x + 4 = y$$

The 1st equation is $y - x = 4$

The 2nd equation is $y + x = 10$

$$\begin{pmatrix} 1 & -1 \\ 1 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 4 \\ 10 \end{pmatrix} \tag{1}$$

$$x = \begin{vmatrix} a1 & b \\ a1 & a2 \end{vmatrix} \tag{2}$$

$$x = \frac{\begin{vmatrix} 1 & 4 \\ 1 & 10 \end{vmatrix}}{\begin{vmatrix} 1 & -1 \\ 1 & 1 \end{vmatrix}} = \frac{10 - 4}{1 - (-1)} = \frac{6}{2} = 3 \tag{3}$$

$$y = \begin{vmatrix} b & a2 \\ a1 & a2 \end{vmatrix} \tag{4}$$

$$y = \frac{\begin{vmatrix} 4 & -1 \\ 10 & 1 \end{vmatrix}}{\begin{vmatrix} 1 & -1 \\ 1 & 1 \end{vmatrix}} \tag{5}$$

$$y = \frac{4 - (-10)}{1 - (-1)} = \frac{14}{2} = 7 \tag{6}$$

$$\tag{7}$$

$$X = 3 \tag{8}$$

$$Y = 7 \tag{9}$$