Linear Equations in Two Variables

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10^{th} Maths - Chapter 3

This is Problem-1.2 from Exercise 3.2

1. 1. Form the pair of linear equations in the following problems, and find their solutions graphically. (ii) 5 pencils and 7 pens together cost ‘ 50, whereas 7 pencils and 5 pens together cost ‘ 46. Find the cost of one pencil and that of one pen.(ii) 5 pencils and 7 pens together cost 50 rupees, whereas 7 pencils and 5 pens together cost 46 rupees. Find the cost of one pencil and that of one pen.
   5x+7y=50
   7x+5y=50

Solution:
This can also be written as:

$$given \begin{pmatrix} 5 & 7 & 50 \\ 7 & 5 & 46 \end{pmatrix} \tag{1}$$

now,Making $R_2 \to 5R_2 - 7R_1$
we get,

$$\begin{pmatrix} 5 & 7 & 50 \\ 0 & -24 & -120 \end{pmatrix} \tag{2}$$

now,Making $R_1 \to 7R_2 - 24R_1$
we get,

$$\begin{pmatrix} 120 & 0 & 360 \\ 0 & -24 & -120 \end{pmatrix} \tag{3}$$

now,Making $R_1 \to R_1$dividd by -120
$R_2 \to R_2$dividd by -24 we get,

$$\begin{pmatrix} 1 & 0 & 3 \\ 0 & 1 & -5 \end{pmatrix} \tag{4}$$

since x=3 and y=5