linear equations in two variables

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10^{th} Maths - Chapter 3

This is Problem-3(1) from Exercise 3.2

1. find out whether the following pair of linear equations are consistent, or inconsistent using matrix
   (i) 3x + 2y = 5 ; 2x - 3y = 7
   Solution:
   given Data

   this can be also written as:

$$\begin{pmatrix} 3 & 2 \\ 2 & -3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 5 \\ 7 \end{pmatrix} \tag{1}$$

$$for finding the value of x = \frac{\begin{vmatrix} b & a2 \end{vmatrix}}{\begin{vmatrix} a1 & a2 \end{vmatrix}} = \frac{\begin{vmatrix} 5 & 2 \\ 7 & -3 \end{vmatrix}}{\begin{vmatrix} 3 & 2 \\ 2 & -3 \end{vmatrix}} = \frac{\begin{vmatrix} -15 & -14 \end{vmatrix}}{\begin{vmatrix} -9 & -4 \end{vmatrix}} = \frac{-29}{-13} = \tag{2}$$

$$for finding value of y = \frac{\begin{vmatrix} a1 & b \end{vmatrix}}{\begin{vmatrix} a1 & a2 \end{vmatrix}} = \frac{\begin{vmatrix} 3 & 5 \\ 2 & 7 \end{vmatrix}}{\begin{vmatrix} 3 & 2 \\ 2 & -3 \end{vmatrix}} = \frac{11}{-13} \tag{3}$$

   therefore,this is a consistent equation