10.3.2.4.2

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Question: Is the following pair of linear equations consistent or inconsistent?If consistent, obtain the solution graphically

$$x - y = 8$$
$$3x - 3y = 16$$

Solution:

Using Matrix notation,

$$\begin{pmatrix} 1 & -1 \\ 3 & -3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 8 \\ 16 \end{pmatrix} \tag{1}$$

Row reduction

$$\begin{pmatrix} 1 & -1| & 8 \\ 3 & -3| & 16 \end{pmatrix} \xleftarrow{R_2 = R_2 - 3R_1} \begin{pmatrix} 1 & -1 & |8 \\ 0 & 0 & |-8 \end{pmatrix} \tag{2}$$

Hence matrix is singular and thus the pair of linear equations is non consistent