Step-1

We have to fill in the blanks for the following question:

For four linear equations in two unknowns x and y, the row picture shows four _____. The column picture is in _____ dimensional space. The equations have no solution unless the vector on the right-hand side is a combination of _____.

Step-2

Let us take the required system as

$$ax + by = k_1$$
$$cx + dy = k_2$$
$$ex + fy = k_3$$
$$gx + hy = k_4$$

Form this; it is clear that the row picture shows four lines.

Step-3

The column picture for the system is as follows:

$$\begin{bmatrix} a \\ c \\ e \\ g \end{bmatrix} x + \begin{bmatrix} b \\ d \\ f \\ h \end{bmatrix} y = \begin{bmatrix} k_1 \\ k_2 \\ k_3 \\ k_4 \end{bmatrix}$$

From this, four dimensional vectors form the column space.

Step-4

And from the above equation it is clear that, the equations have no solution unless the vector on the right-hand side is a combination of the two columns.