

## Step-1

Consider the following equations:

$$x + y = 4$$

$$2x - 2y = 4$$

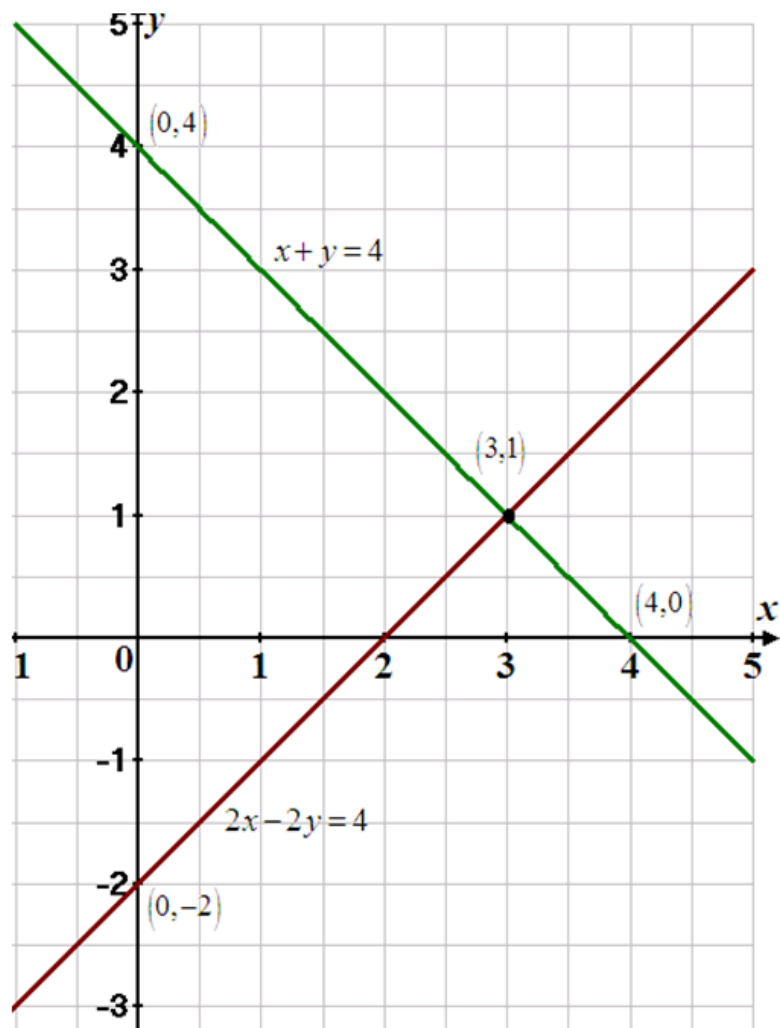
The equation  $x + y = 4$  represented by a straight line in the  $x$ - $y$  plane. The line goes through the points  $x = 2, y = 2$  and  $x = 4, y = 0$ .

The second equation  $2x - 2y = 4$  is also represented by a straight line in the  $x$ - $y$  plane.

This line goes through the points  $x = 0, y = -2$  and it crosses the first line at the solution.

Draw the row picture and the column picture for the equations  $x + y = 4, 2x - 2y = 4$

The required diagram is shown as follows:



The two lines are intersecting at the point  $(3, 1)$ .

## Step-2

Column form of the given equations as follows

$$x \begin{pmatrix} 1 \\ 2 \end{pmatrix} + y \begin{pmatrix} 1 \\ -2 \end{pmatrix} = \begin{pmatrix} 4 \\ 4 \end{pmatrix}$$

Now consider

$$\begin{aligned}
3\begin{pmatrix} 1 \\ 2 \end{pmatrix} + 1\begin{pmatrix} 1 \\ -2 \end{pmatrix} &= \begin{pmatrix} 3 \\ 6 \end{pmatrix} + \begin{pmatrix} 1 \\ -2 \end{pmatrix} \\
&= \begin{pmatrix} 3+1 \\ 6-2 \end{pmatrix} \\
&= \begin{pmatrix} 4 \\ 4 \end{pmatrix}
\end{aligned}$$

Therefore  $3(\text{column1}) + 1(\text{column2}) = (4, 4)$

Sketch the column picture as shown below.

