

Step-1

Consider the equations,

$$x + 2y = 2$$

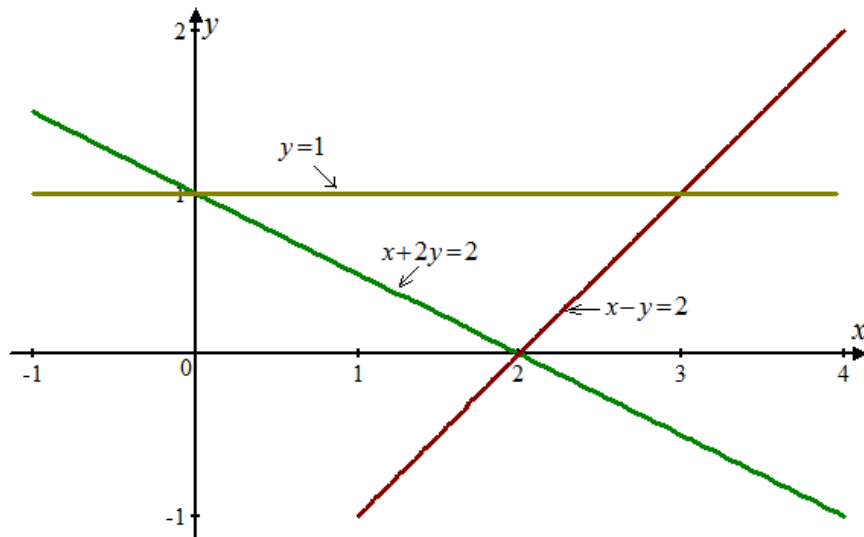
$$x - y = 2$$

$$y = 1 \quad \text{--- (1)}$$

Its need to sketch the three lines and form it, decide whether the equations are solvable or not.

Step-2

Sketch of the given three lines is shown below:



Step-3

From the figure above, observe that every pair of lines has a point of intersection.

But three lines put together have no common point.

Therefore, the given equations have no solution.

That means, given equations are **not solvable**.

Step-4

Take right hand sides as zero for the system (1) and discuss the solution nature.

$$\begin{aligned}x + 2y &= 0 \\x - y &= 0 \\y &= 0\end{aligned}$$

Solution of it is $(0,0)$. That is, the three lines are passing through origin.

In other words, the origin $(0,0)$ is the solution for the given system when the right hand sides of the equations become zero.

Step-5

Consider the new system,

$$\begin{aligned}x + 2y &= 6 \\x - y &= 3 \\y &= 1\end{aligned}$$

Notice that $(x,y) = (4,1)$ is a solution (intersection point of three lines) of the above system and it was graphically shown below.

