Exercise 3A

Question 1:

On a graph paper, draw a horizontal line X'OX and a vertical line YOY' as the x-axis and the y-axis respectively.

Given equations are $2x + 3y = 2$ and $x - 2y = 8$

Graph of $2x + 3y = 2$:

$$y = \frac{2(1-x)}{3}$$

Putting $x = 1$, we get $y = 0$
Putting $x = -2$, we get $y = 2$
Putting $x = 4$, we get $y = -2$
$\therefore$ Table for $2x + 3y = 2$ is

x	1	-2	4
y	0	2	-2

Plot the points A (1, 0), B (-2, 2) and C (4, -2) on the graph paper. Join AB and AC to get the graph line BC. Extend it on both ways.
Thus, line BC is the graph of $2x + 3y = 2$.

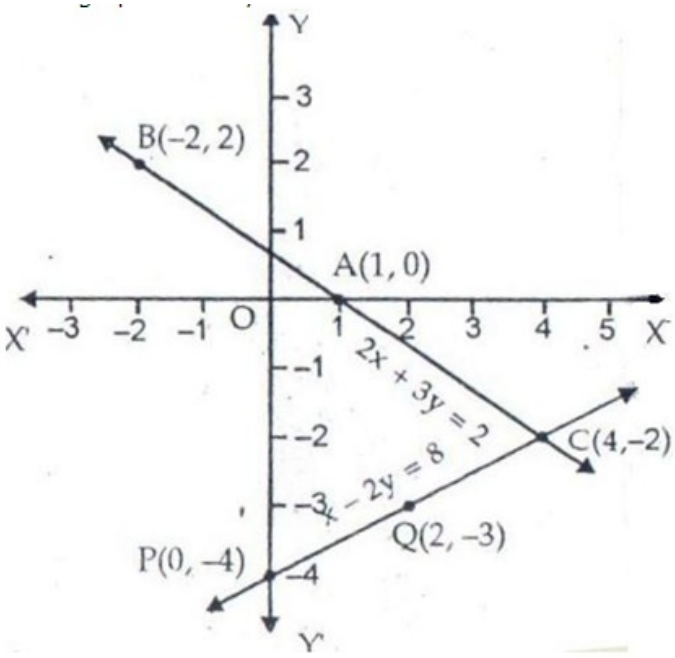
Graph of $x - 2y = 8$:

$$y = \frac{x-8}{2}$$

Putting $x = 2$, we get $y = -3$
Putting $x = 4$, we get $y = -2$
Putting $x = 0$, we get $y = -4$
Table for $x - 2y = 8$ is

x	2	4	0
y	-3	-2	-4

Now, on the same graph paper as above plot the points P(0, -4) and Q(2, -3). The point C(4,-2) has already been plotted. Join QC and extend it. Thus, the line PC is the graph of $x - 2y = 8$.



The two graph lines interest at C(4, -2)
∴ x = 4, y = -2 is the solution of given system of equations.

Question 2:

On a graph paper, draw a horizontal line X'OX and a vertical line YOY' as the x-axis and the y-axis respectively.

Given equations are 3x + 2y = 4 and 2x - 3y = 7

Graph of 3x + 2y = 4:

$3x + 2y = 4$

$\Rightarrow y = \frac{4 - 3x}{2}$

Thus we have the following table for 3x + 2y = 4

x	0	2	-2
y	2	-1	5

Plot the points A (0, 2), B (2, -1) and C (-2, 5) on the graph paper. Join AB and AC to get the graph line BC. Extend it on both ways.
Thus, line BC is the graph of 3x + 2y = 4.

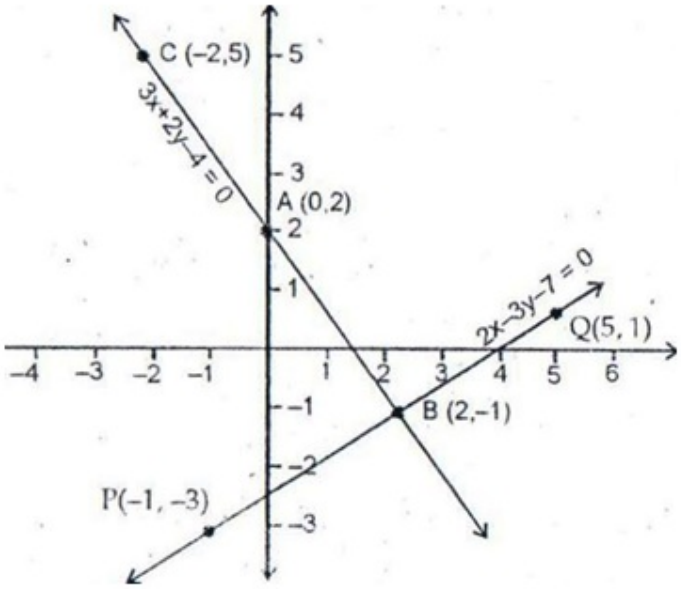
Graph of 2x - 3y = 7

$\Rightarrow y = \frac{2x - 7}{3}$

thus, we have the following table for 2x - 3y = 7

x	2	-1	5
y	-1	-3	1

On the same graph paper as above plot the points P (-1, -3) and Q (5, 1). The point B (2,-1) has already been plotted. Join PB and QB and extend it. Thus, the line PQ is the graph of 2x - 3y = 7.



The two graph lines intersect at point B(2, -1)
∴ x = 2, y = -1 is the solution of the given system of equations

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