Exercise 3A

Question 15:

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

Graph of 4x - 5y + 16 = 0:

$4x - 5y + 16 = 0 \Rightarrow \frac{4x+16}{5} = y$ or $y = \frac{4x+16}{5}$

Thus, we have the following table for 4x - 5y + 16 = 0

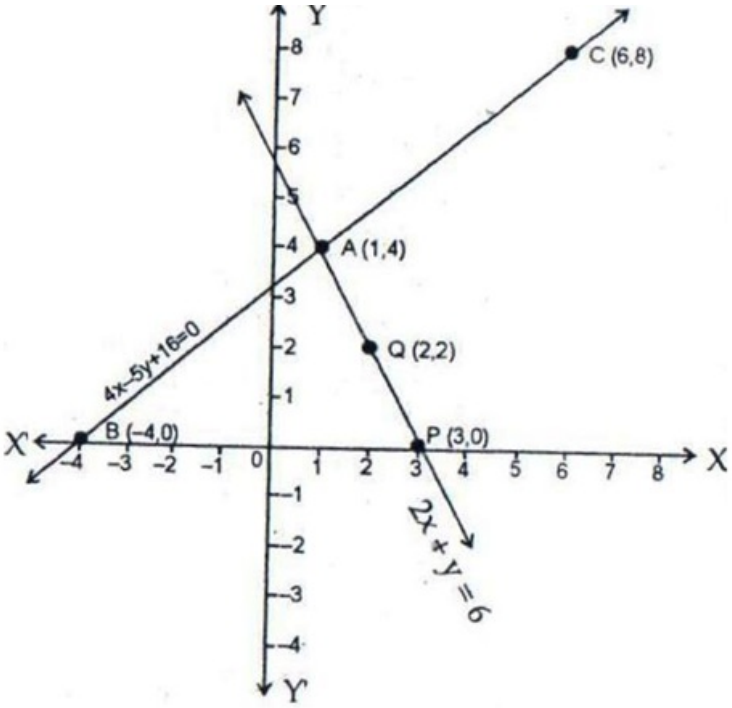
x	1	-4	6
y	4	0	8

On the graph paper plot the points A (1, 4), B (-4, 0) and C (6, 8)
Joint AB and AC to get BC
Thus, BC is the graph of the equation 4x - 5y + 16 = 0

Graph of 2x + y - 6 = 0:

2x + y - 6 = 0 ⇒ y = -2x + 6
Thus, we have the following table for 2x + y - 6 = 0

x	1	3	2
y	4	0	2



On the same graph as above, plot the points P (3, 0), Q (2, 2).
The third point A (1, 4) has been already plotted.
Join PQ and QA to get PA.
Thus, line PA is the graph of the equations 2x + y - 6 = 0
The two graph lines intersect at A(1, 4)

∴ x = 1, y = 4 is the solution of the given system of equations
Clearly, the given equations are represented by the graph lines BC and PA respectively.

The vertices of ΔBAP formed by these lines and the x-axis are B(-4, 0), A(1, 4) and P(3, 0)

Question 16:

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

Graph of 2x - 3y - 17 = 0:

2x - 3y - 17 = 0, -3y = 17 - 2x

$\Rightarrow \quad y = \frac{-17+2x}{3}$ or $y = \frac{2x-17}{3} \quad ---(1)$

Thus, we have the following table for 2x - 3y - 17 = 0

x	1	4	7
y	-5	-3	-1

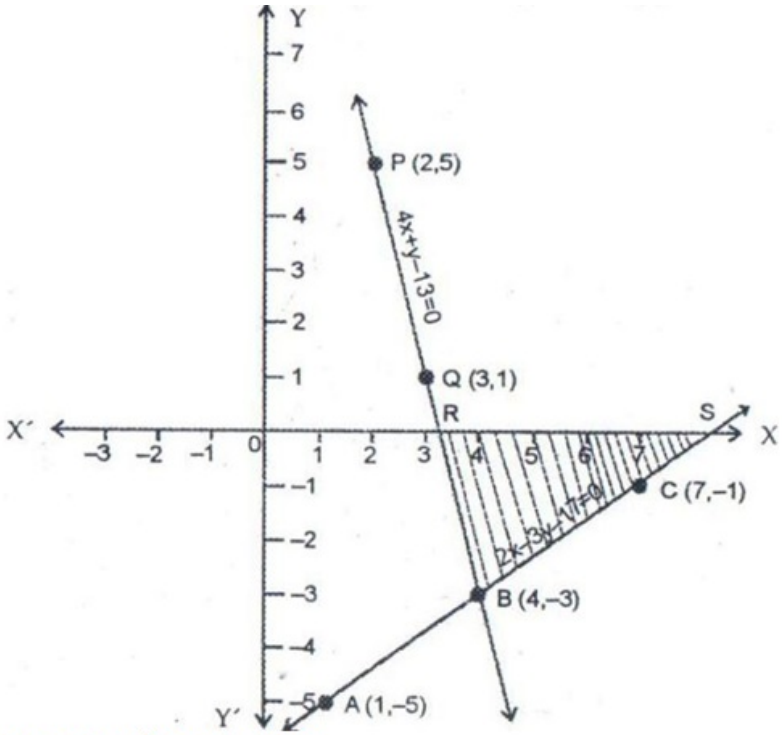
On the graph paper plot the points A (1, -5), B (4, -3) and C (7, -1).
Join AB and BC to get AC
Thus, line AC is the graph of the equation 2x - 3y - 17 = 0

Graph of 4x + y - 13 = 0:

4x + y - 13 = 0 ⇒ y = -4x + 13 ---(2)
Thus, we have the following table for 4x + y - 13 = 0

x	4	2	3
y	-3	5	1

On the same graph paper as above, plot the points P (2, 5) and Q (3, 1)
The point B (4, -3) has been already plotted.



Joint PQ and QB to get PB.
Thus, line PB is the graph of equation 4x + y - 13 = 0
The two graph lines intersect at the point B (4, -3)
x = 4, y = -3 is the solution of the given system of equations

These graph lines intersect the x-axis at R and S
The region bounded by these lines and the x-axis has been shaded

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