

Exercise 3.2

Q.1

$$x + y = 3$$

$$x = 3 - y$$

x	3	2	0
y	0	1	3

Sol. - (1, 2)

$$x = 1$$

$$2x + 5y = 12$$

$$x = \frac{12 - 5y}{2}$$

x	1	-4	6
y	2	4	0

$$y = 2$$

Q.2

$$x - 2y = 5$$

$$x = 5 + 2y$$

x	5	3	1
y	0	-1	-2

Sol. - (5, 0)

$$x = 5$$

$$2x + 3y = 10$$

$$x = \frac{10 - 3y}{2}$$

x	5	2	-1
y	0	2	4

$$y = 0$$

Q.3

$$3x + y + 1 = 0$$

$$y = -3x - 1$$

x	0	1	-1
y	-1	-4	2

Sol. - (-1, 2)

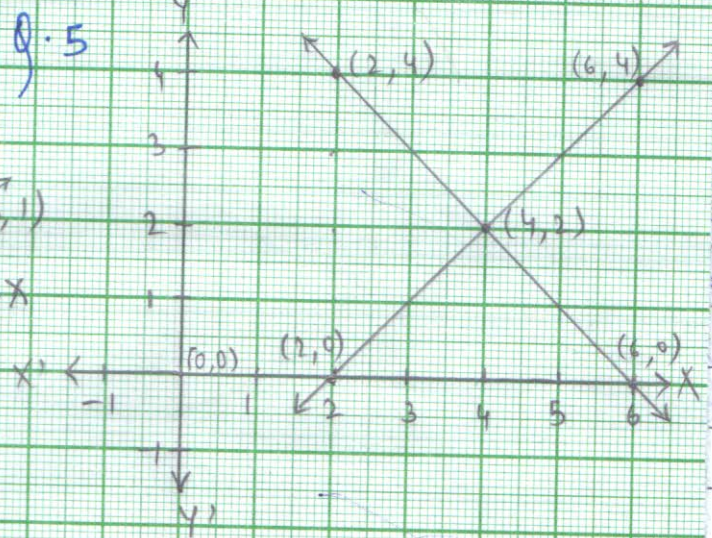
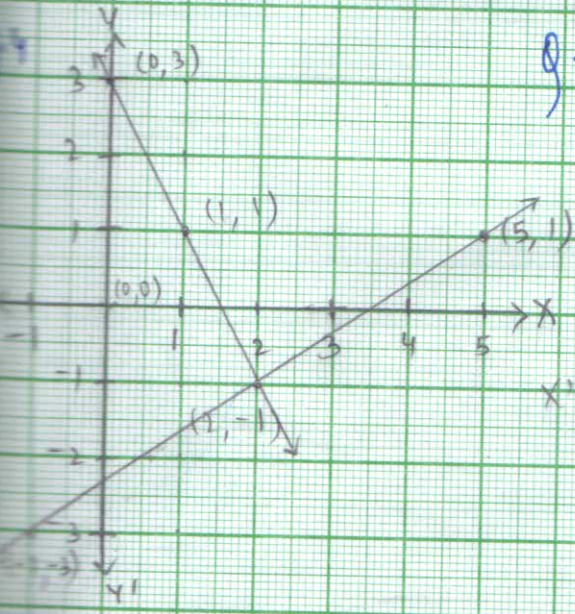
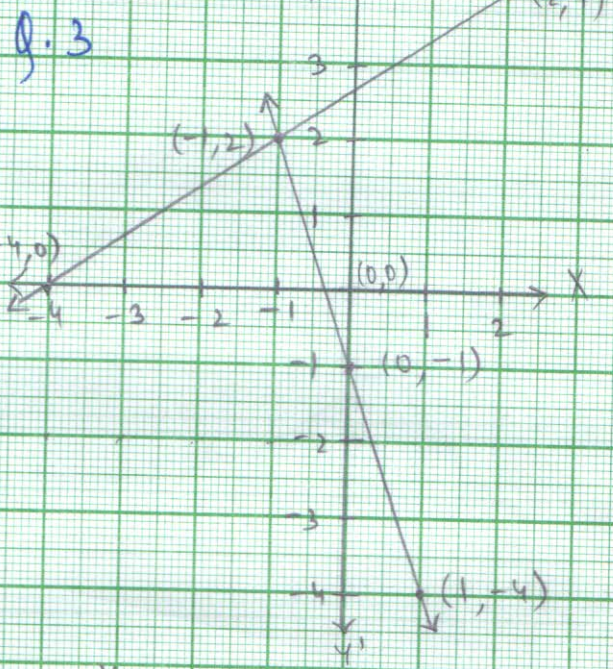
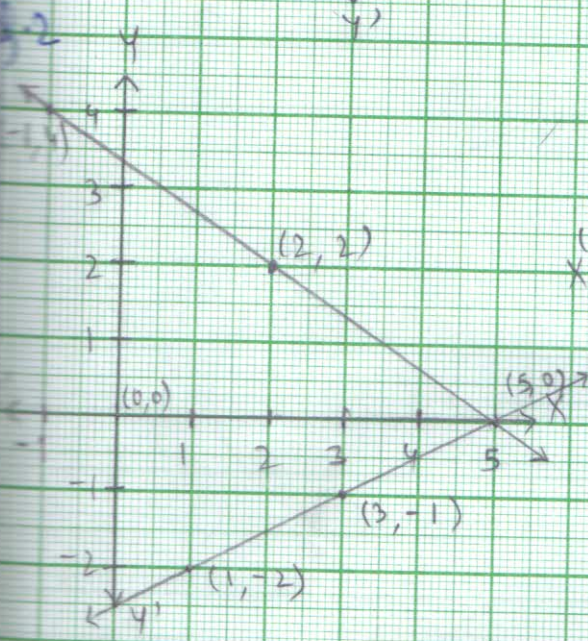
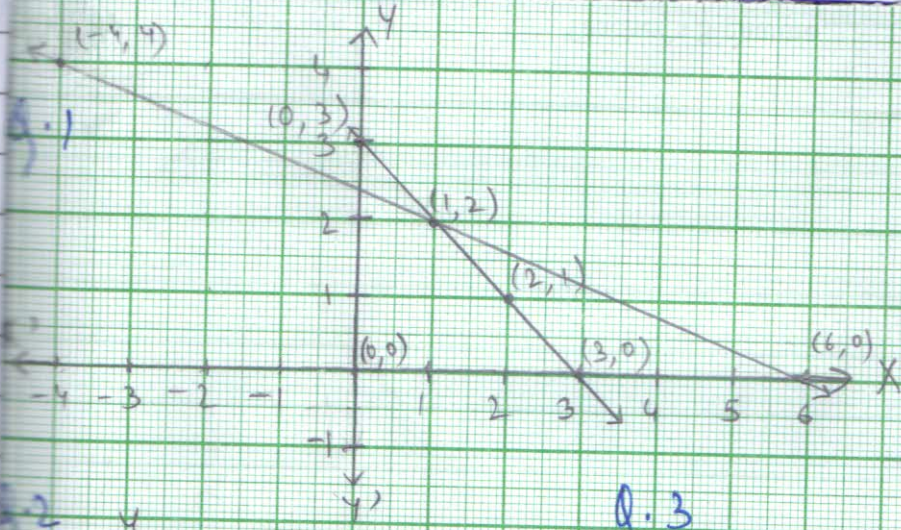
$$x = -1$$

$$2x - 3y + 8 = 0$$

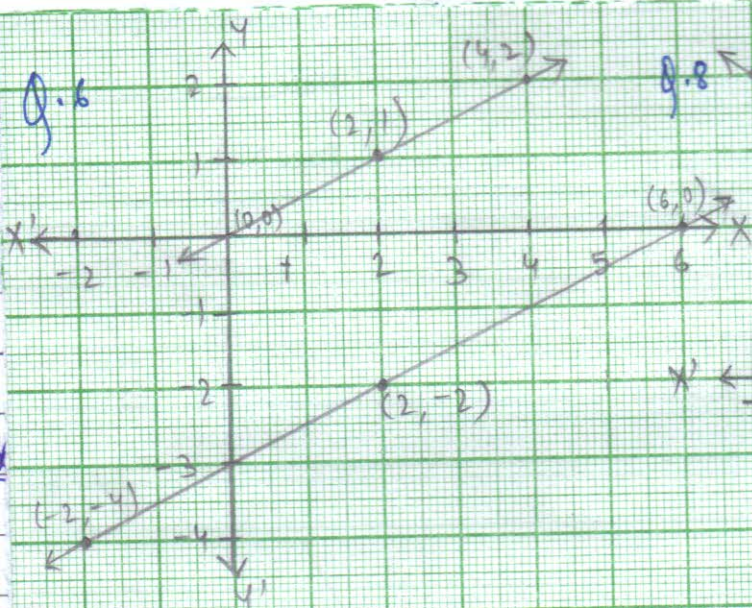
$$x = \frac{3y - 8}{2}$$

x	-4	-1	2
y	0	2	4

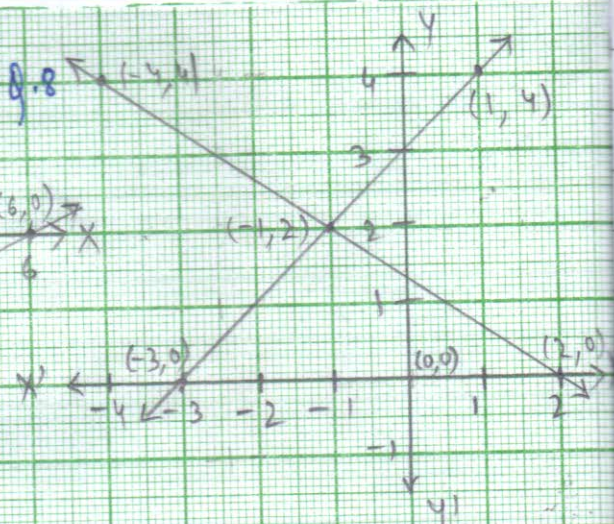
$$y = 2$$



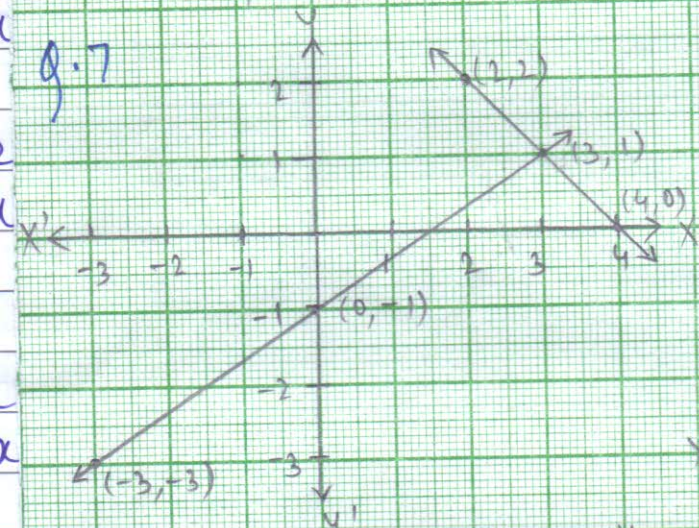
Q.6



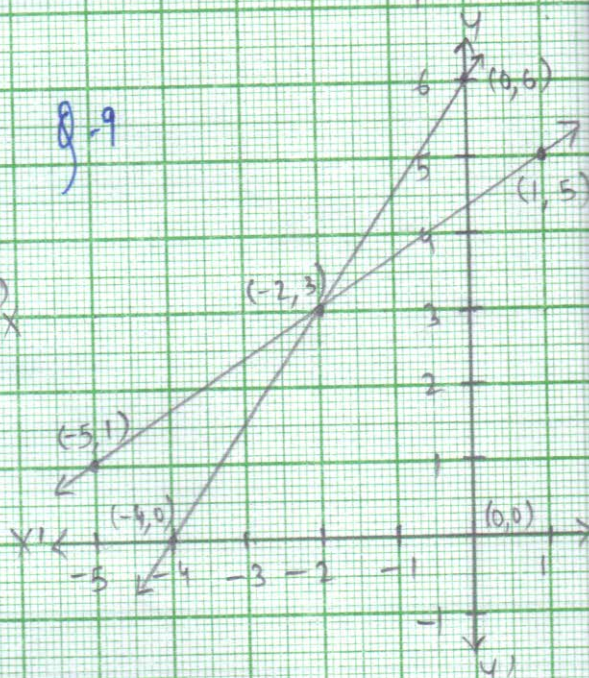
Q.8



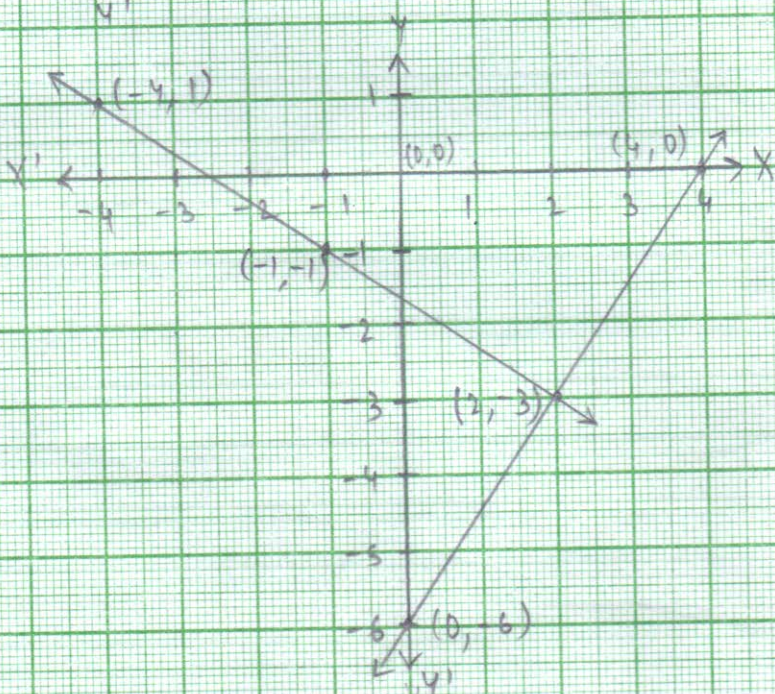
Q.7



Q.9



Q.10



Q.4 $2x + y - 3 = 0$
 $y = -2x + 3$

x	0	1	2
y	3	1	-1

Sol. - - (2, -1)

$x = 2$

$2x - 3y - 7 = 0$

$x = \frac{3y + 7}{2}$

x	5	2	-1
y	1	-1	-3

$y = -1$

Q.5 $x + y = 6$
 $x = 6 - y$

x	6	4	2
y	0	2	4

Sol. - (4, 2)

$x = 4$

$x - y = 2$

$x = 2 + y$

x	2	4	6
y	0	2	4

$y = 2$

Q.6 $x - 2y = 6$
 $x = 6 + 2y$

x	6	2	-2
y	0	-2	-4

No solution

$3x - 6y = 0$

$3x = 6y$

$x = 2y$

x	0	4	2
y	0	2	1

Q.7 $x + y = 4$
 $x = 4 - y$

x	4	3	2
y	0	1	2

Sol. - (3, 1)

$x = 3$

$2x - 3y = 3$

$x = \frac{3 + 3y}{2}$

x	3	0	-3
y	1	-1	-3

$y = 1$

Q.8 $2x + 3y = 4$
 $x = \frac{4 - 3y}{2}$

x	2	-1	-4
y	0	2	4

Sol. - (-1, 2)

$x = -1$

$y = 2$

$$x - y + 3 = 0$$

$$x = y - 3$$

x	-3	-1	1
y	0	2	4

Q.9

$$2x - 3y + 13 = 0$$

$$x = \frac{3y - 13}{2}$$

x	-5	-2	1
y	1	3	5

Sol. $\rightarrow (-2, 3)$

$$x = -2$$

$$y = 3$$

$$3x - 2y + 12 = 0$$

$$x = \frac{2y - 12}{3}$$

x	-4	-2	0
y	0	3	6

Q.10

$$2x + 3y + 5 = 0$$

$$x = \frac{-3y - 5}{2}$$

x	-4	-1	2
y	1	-1	-3

Sol. $\rightarrow (2, -3)$

$$x = 2$$

$$y = -3$$

$$3x - 2y - 12 = 0$$

$$x = \frac{2y + 12}{3}$$

x	4	2	0
y	0	-3	-6

Q.11

$$2x + 3y = 6$$

$$x = \frac{6 - 3y}{2}$$

x	3	0	-3
y	0	2	4

$\therefore$ This pair has infinitely many solutions.

$$4x + 6y = 12$$

$$2x + 3y = 6$$

$$x = \frac{6 - 3y}{2}$$

x	3	0	-3
y	0	2	4

Q.14

$$x - 2y + 11 = 0$$

$$x = 2y - 11$$

x	-5	-1	-3
y	3	5	4

$\therefore$ This pair has infinitely

$$3x - 6y + 33 = 0$$

$$x - 2y + 11 = 0$$

$$x = 2y - 11$$

x	-5	-1	-3
y	3	5	4

many solutions.

Q.16

$$x - 2y = 6$$

$$x = 2y + 6$$

x	6	4	2
y	0	-1	-2

∴ This pair is inconsistent (No solution).

$$3x - 6y = 0$$

$$3x = 6y$$

$$x = 2y$$

x	2	4	0
y	1	2	0

Q.18

$$3x - 4y - 1 = 0$$

$$x = \frac{4y + 1}{3}$$

x	3	7	-1
y	2	5	-1

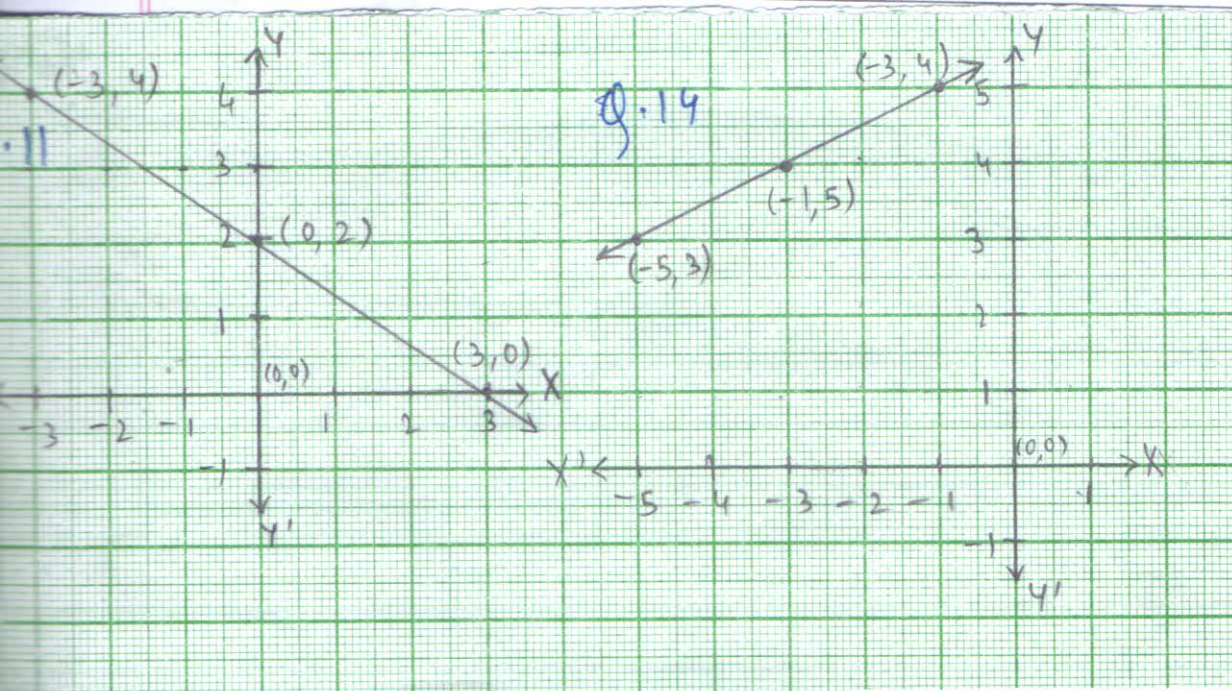
∴ This pair is inconsistent (No solution)

$$2x - \frac{8}{3}y + 5 = 0$$

$$6x - 8y + 15 = 0$$

$$x = \frac{8y - 15}{6}$$

x	-2.5	1.5	5.5
y	0	3	6



Q.19 (i) $2y - x = 8$
 $x = 2y - 8$

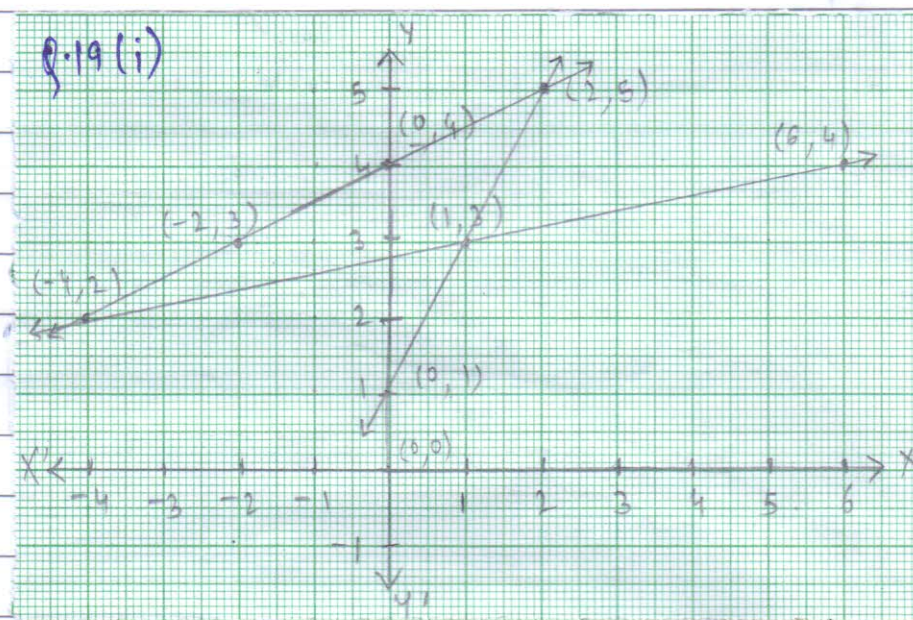
x	-4	-2	0
y	2	3	4

$5y - x = 14$
 $x = 5y - 14$

x	-4	1	6
y	2	3	4

$y - 2x = 1$
 $y = 1 + 2x$

x	0	1	2
y	1	3	5



$\therefore$ The vertices of Δ are $(-4, 2)$; $(1, 3)$; $(2, 5)$

(ii) $y = x$

x	1	2	3
y	1	2	3

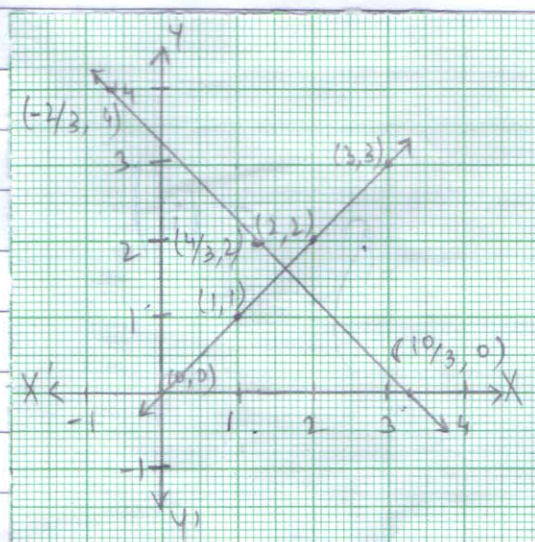
$y = 0$

$\therefore$ It is x -axis.

$3x + 3y = 10$

$$x = \frac{10 - 3y}{3}$$

x	10/3	4/3	-2/3
y	0	2	-4



$\therefore$ The vertices of Δ are $(0,0)$; $(\frac{10}{3}, 0)$; $(\frac{8}{5}, \frac{8}{5})$

Q.20

$$x - 2y = 2$$

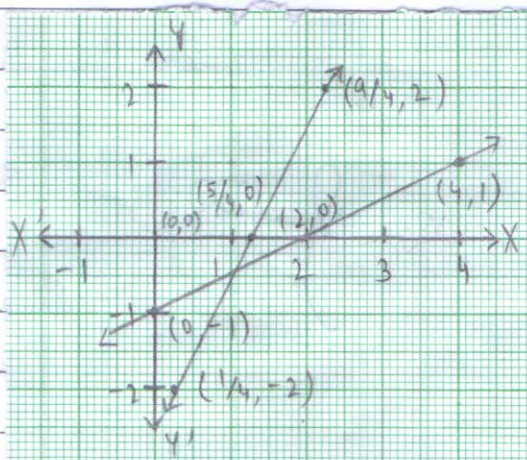
$$x = 2y + 2$$

x	2	4	0
y	0	1	-1

$$4x - 2y = 5$$

$$x = \frac{2y + 5}{4}$$

x	5/4	9/4	1/4
y	0	2	-2



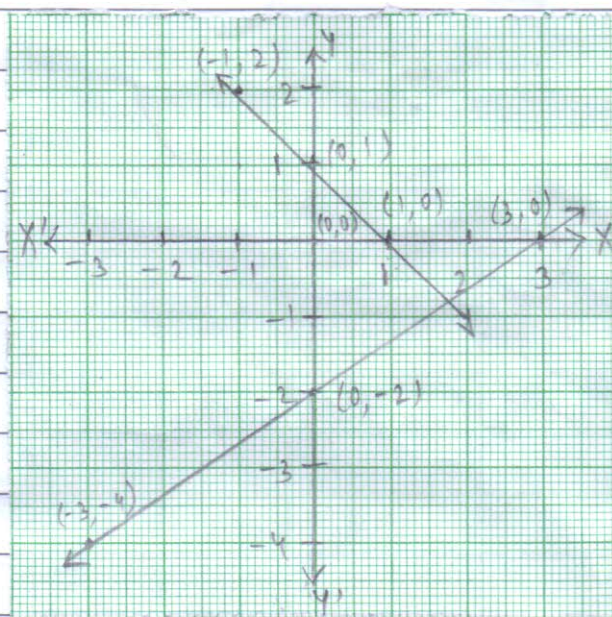
$\therefore$ This pair is consistent (unique solution)

Q.21(i) $2x - 3y = 6$
 $x = \frac{3y + 6}{2}$

x	3	0	-3
y	0	-2	-4

$x + y = 1$
 $x = 1 - y$

x	1	0	-1
y	0	1	2



∴ This pair has a unique solution.

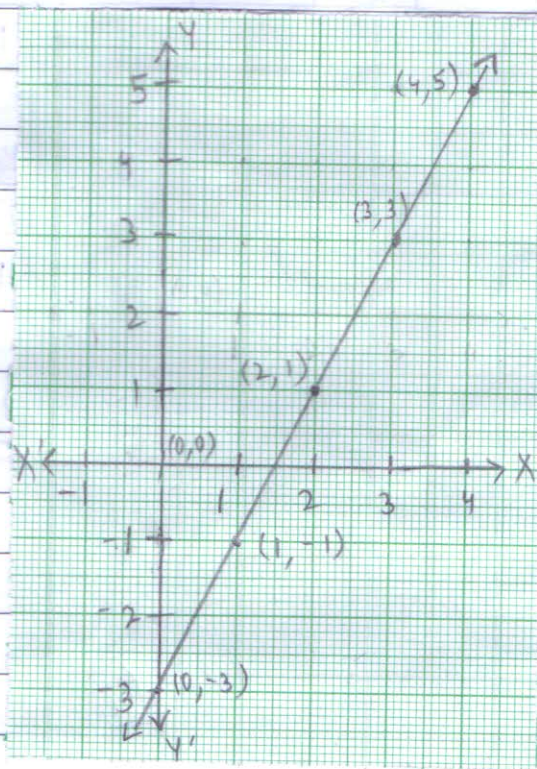
(ii) $2y = 4x - 6$
 $y = \frac{4x - 6}{2}$

x	0	3	4
y	-3	3	5

$2x = y + 3$

$x = \frac{y + 3}{2}$

x	2	3	1
y	1	3	-1



$\therefore$ This pair has infinitely many solutions

Q. 22(i)

$$2x - 5y + 4 = 0$$

$$x = \frac{5y - 4}{2}$$

x	-2	3	-1
y	0	2	-2

$\therefore$ The line meets y-axis at

$$\left(0, \frac{4}{5}\right)$$

$$2x + y - 8 = 0$$

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

x	4	3	2
y	0	2	4

(ii) $3x + 2y = 12$

$$x = \frac{12 - 2y}{3}$$

x	4	2	0
y	0	3	6

$\therefore$ These lines meet y-axis at $(0, 6)$ & $(0, -2)$

$$5x - 2y = 4$$

$$x = \frac{4 + 2y}{5}$$

x	2	0	4
y	3	-2	8

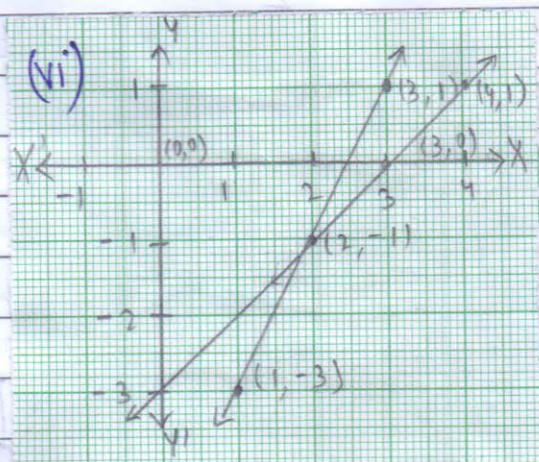
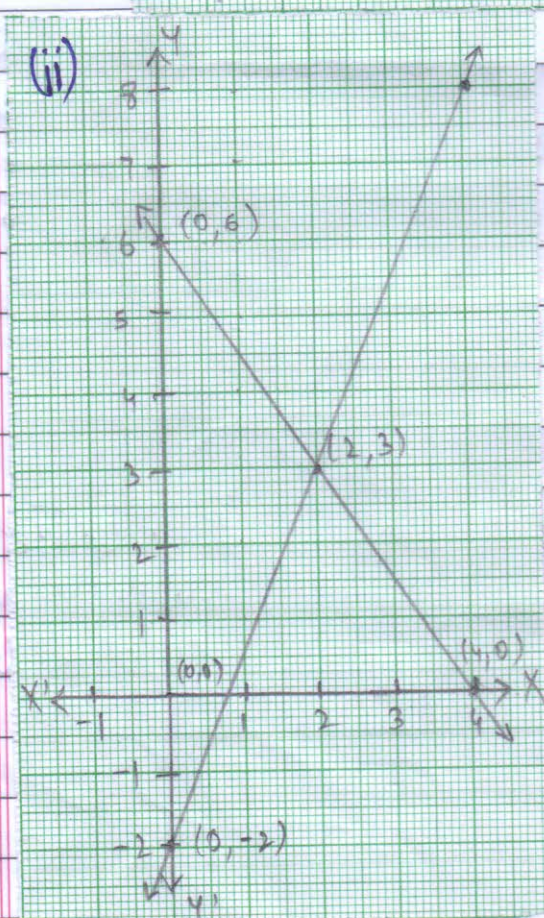
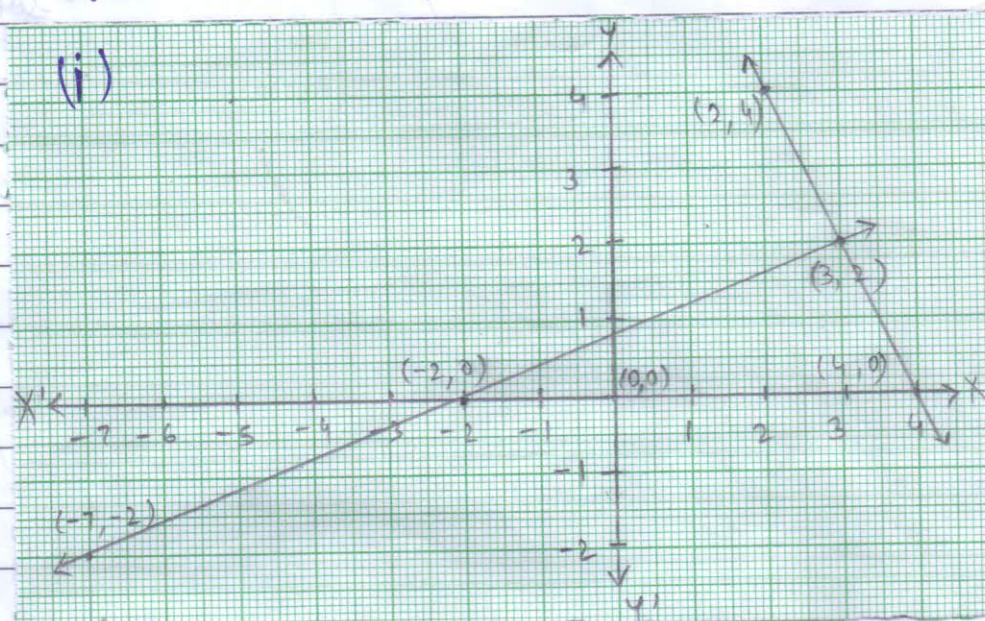
(vi) $2x - y - 5 = 0$
 $x = \frac{y + 5}{2}$

x	1	2	3
y	-3	-1	1

∴ The line meets
 y -axis at
 $(0, -3)$

$x - y - 3 = 0$
 $x = y + 3$

x	3	4	2
y	0	1	-1



5/06/2020

classmate

Date _____

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Ch-3

Pair of Linear Equations in Two Variables

Exercise 3.2

Q. 23(i) $2x + 3y = 12$
 $x = \frac{-3y + 12}{2}$

x	6	3	0
y	0	2	4

$2 - y = 1$
 $x = 1 + y$

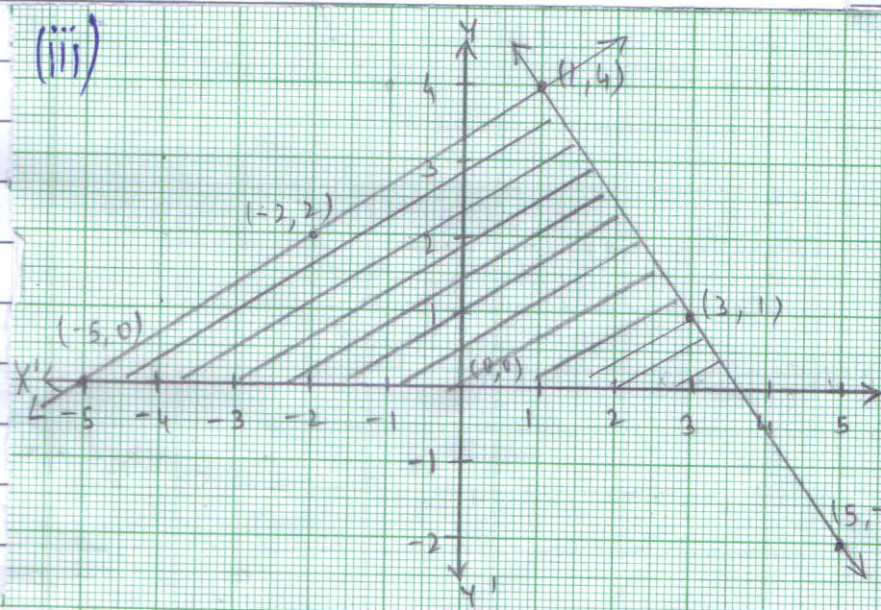
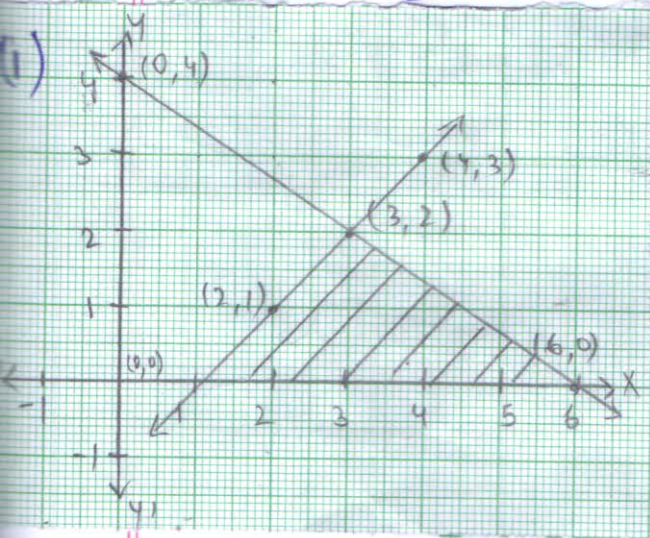
x	2	3	4
y	1	2	3

(iii) $3x + 2y - 11 = 0$
 $x = \frac{11 - 2y}{3}$

x	3	1	5
y	1	4	-2

$2x - 3y + 10 = 0$
 $x = \frac{3y - 10}{2}$

x	-5	-2	1
y	0	2	4



Q. 24

$$2x + 3y = 12$$

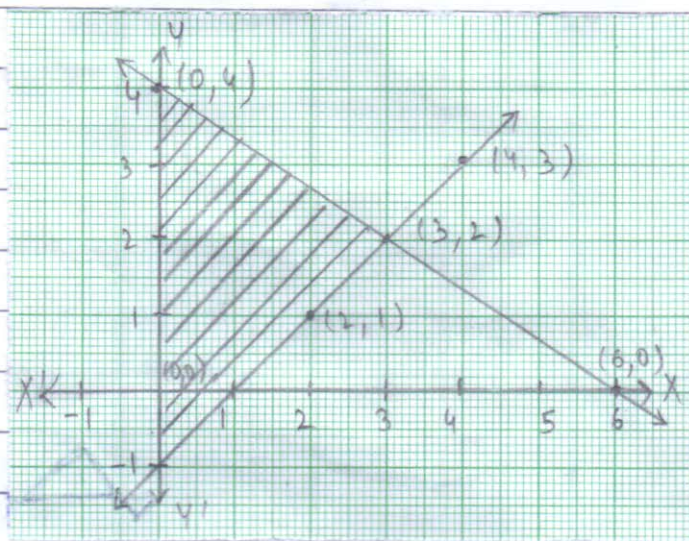
$$x = \frac{-3y + 12}{2}$$

x	6	3	0
y	0	2	4

$$x - y = 1$$

$$x = 1 + y$$

x	2	3	4
y	1	2	3



∴ The vertices of Δ are $(3, 2)$; $(0, 4)$ & $(0, -1)$.

Q. 25

$$x - y + 1 = 0$$

$$x = y - 1$$

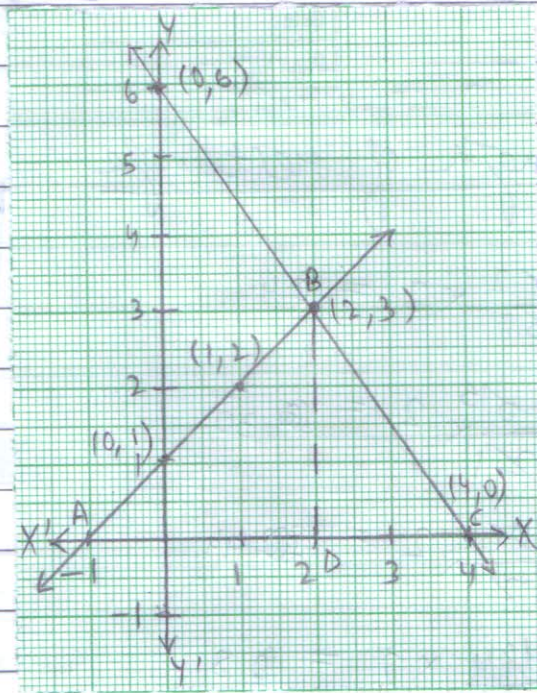
x	0	1	2
y	1	2	3

$$3x + 2y - 12 = 0$$

$$x = \frac{12 - 2y}{3}$$

x	4	2	0
y	0	3	6

$$\begin{aligned} \text{Area of } \Delta &= \frac{1}{2} \times \text{AB} \times \text{CD} = \frac{1}{2} \times 5 \times 3 \\ &= \frac{15}{2} = \boxed{7.5 \text{ sq. units}} \end{aligned}$$

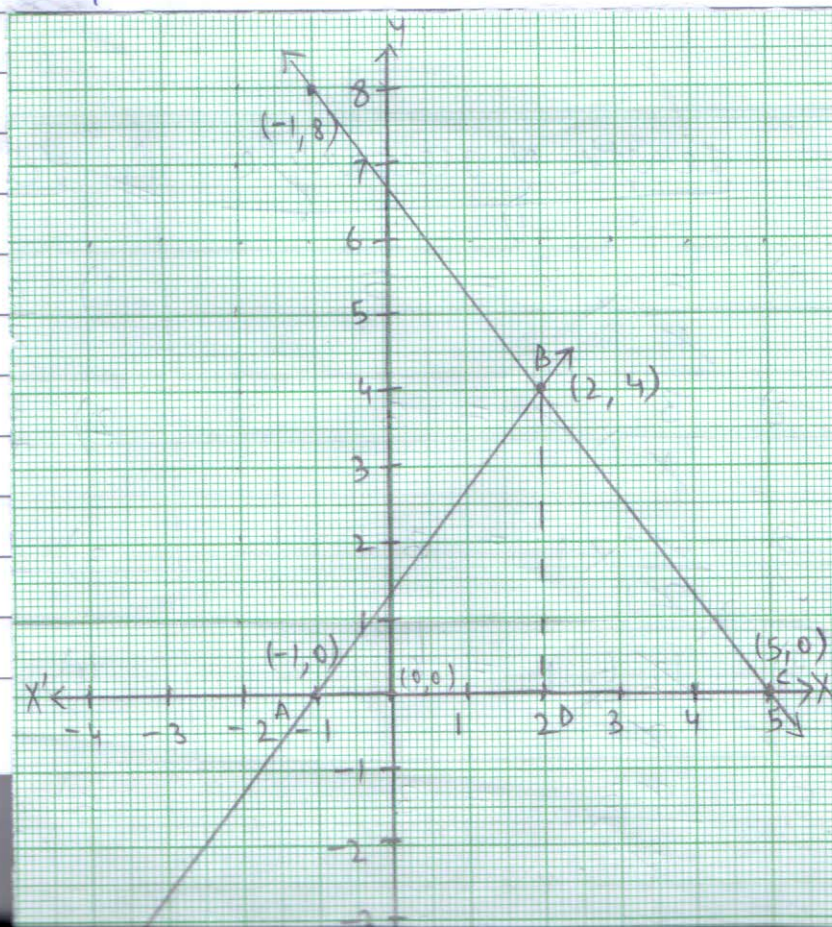


Q. 26 $4x - 3y + 4 = 0$
 $x = \frac{3y - 4}{4}$

x	-1	2	-4
y	0	4	-4

$4x + 3y - 20 = 0$
 $x = \frac{20 - 3y}{4}$

x	5	2	-1
y	0	4	8



$$\text{Area of } \Delta = \frac{1}{2} \times AC \times BD = \frac{1}{2} \times 6 \times 4$$

$$= \boxed{12 \text{ sq. units}}$$

Q. 27 $3x + y - 11 = 0$

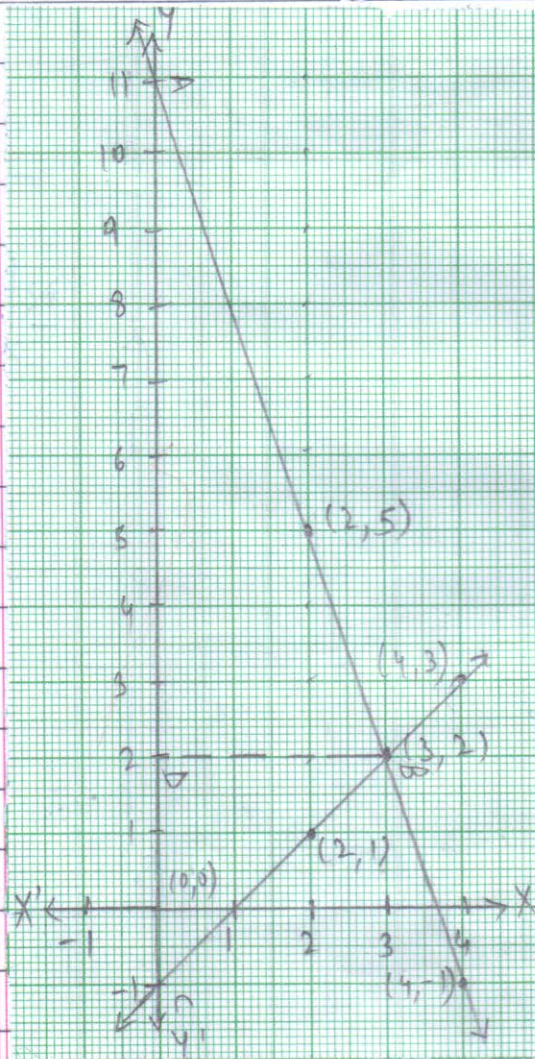
$$x = \frac{11 - y}{3}$$

x	2	3	4
y	5	2	-1

$$x - y - 1 = 0$$

$$x = y + 1$$

x	2	3	4
y	1	2	3



$$\text{Area of } \Delta = \frac{1}{2} \times AC \times BD$$

$$= \frac{1}{2} \times 6 \times 6$$

$$= \boxed{18 \text{ sq. units}}$$

Q. 28

(i) $2x + y = 6$
 $y = 6 - 2x$

x	1	2	3
y	4	2	0

$\therefore$ These lines meet X-axis at (3, 0) & (-2, 0)

$x - 2y = -2$
 $x = 2y - 2$

x	-2	0	2
y	0	1	2

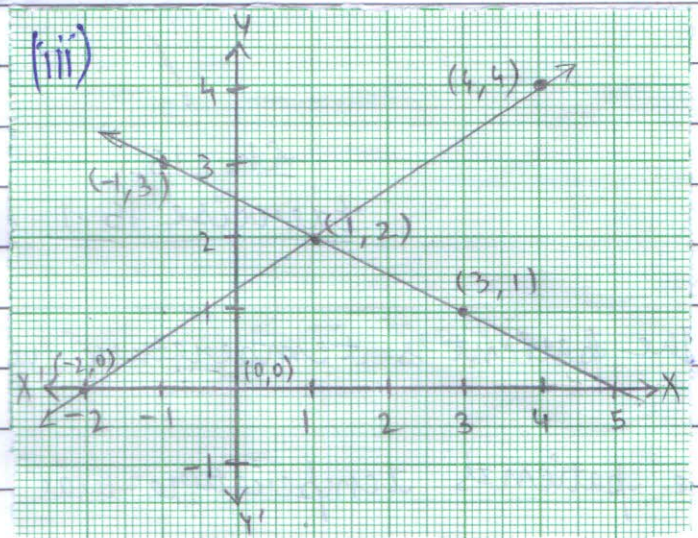
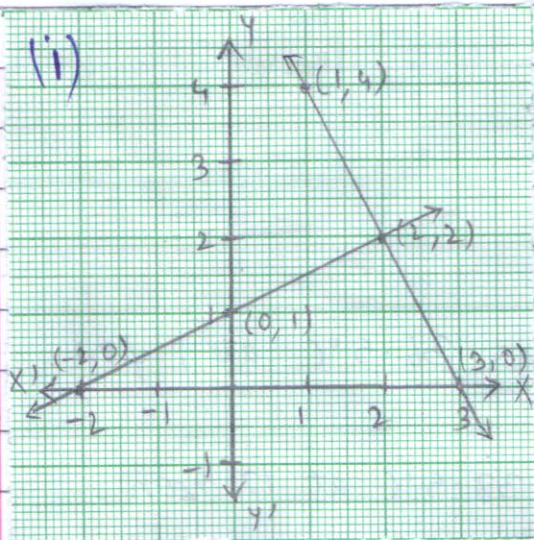
(ii) $x + 2y = 5$
 $x = 5 - 2y$

x	3	1	-1
y	1	2	3

$\therefore$ These lines meet X-axis at (5, 0) & (-2, 0)

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

x	-2	1	4
y	0	2	4



Q.29

$$2x - 3y + 6 = 0$$

$$2 = \frac{3y - 6}{2}$$

x	-3	0	3
y	0	2	4

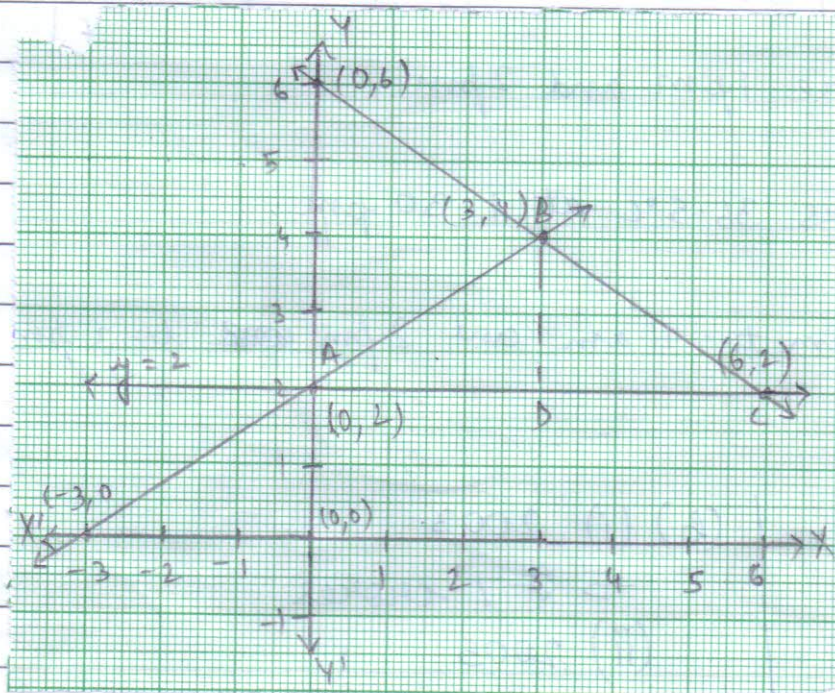
$$2x + 3y - 18 = 0$$

$$x = \frac{18 - 3y}{2}$$

x	3	0	6
y	4	6	2

$$y - 2 = 0$$

$$\boxed{y = 2}$$



$$\text{Area of } \Delta = \frac{1}{2} \times AC \times BD$$

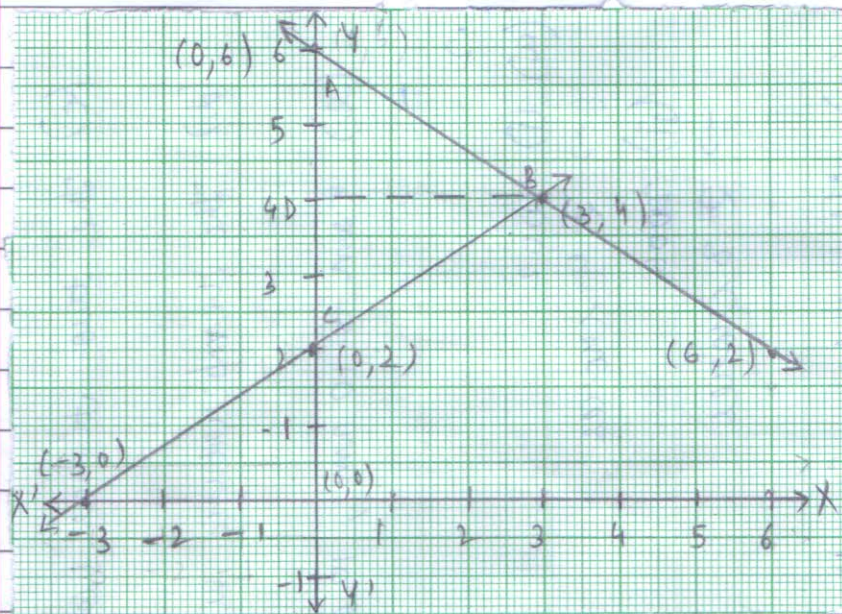
$$= \frac{1}{2} \times 6 \times 2 = \boxed{6 \text{ sq. units}}$$

Q.30 $2x - 3y + 6 = 0$
 $x = \frac{3y - 6}{2}$

x	-3	0	3
y	0	2	4

$2x + 3y - 18 = 0$
 $x = \frac{18 - 3y}{2}$

x	3	0	6
y	4	6	2



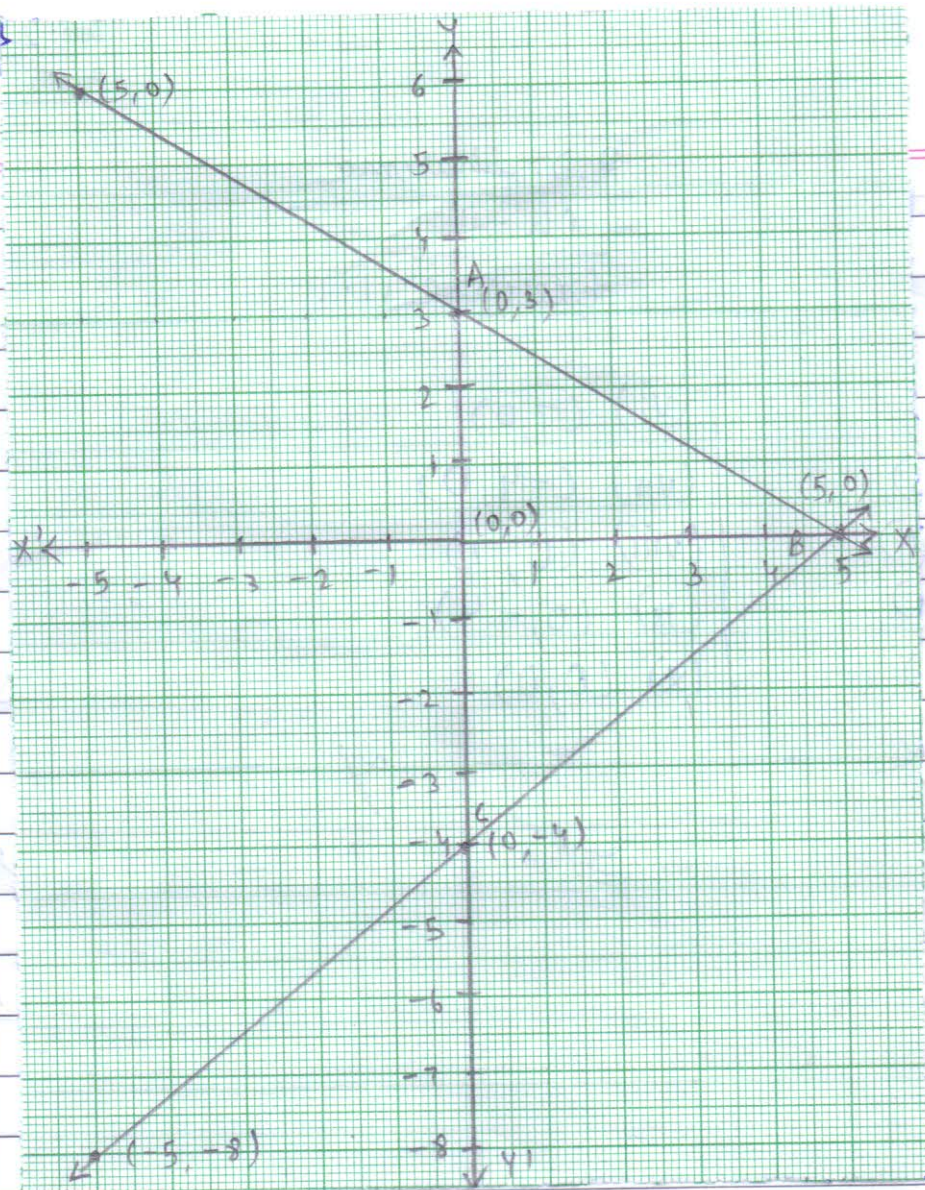
Area of Δ
 $= \frac{1}{2} \times AC \times BD$
 $= \frac{1}{2} \times 24 \times 3$
 $= \underline{16 \text{ sq. units}}$

Q.31 $4x - 5y - 20 = 0$
 $x = \frac{5y + 20}{4}$

x	5	0	-5
y	0	-4	-8

$3x + 5y - 15 = 0$
 $x = \frac{15 - 5y}{3}$

x	5	0	-5
y	0	3	6



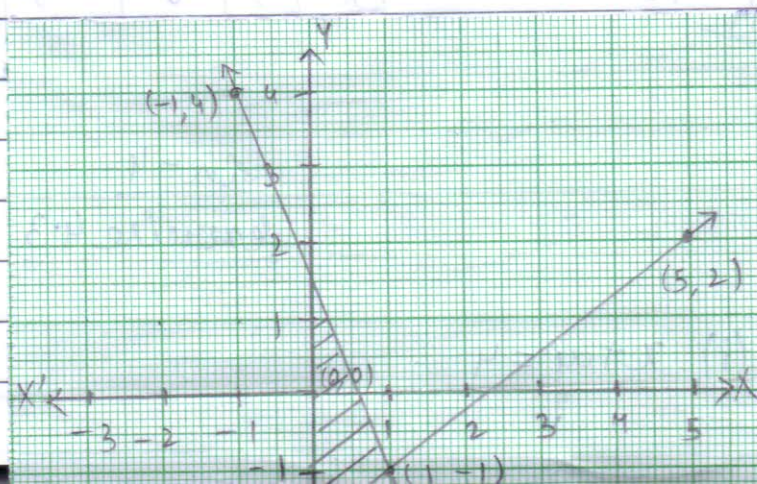
The vertices
of $\triangle ABC$ are
~~A(5, 0)~~ A(0, 3);
B(5, 0); C(0, -4)

Q. 34(i) $3x - 4y = 7$
 $x = \frac{4y + 7}{3}$

x	1	-3	5
y	-1	-4	2

$5x + 2y = 3$
 $x = \frac{3 - 2y}{5}$

x	1	-1	3
y	-1	4	-6

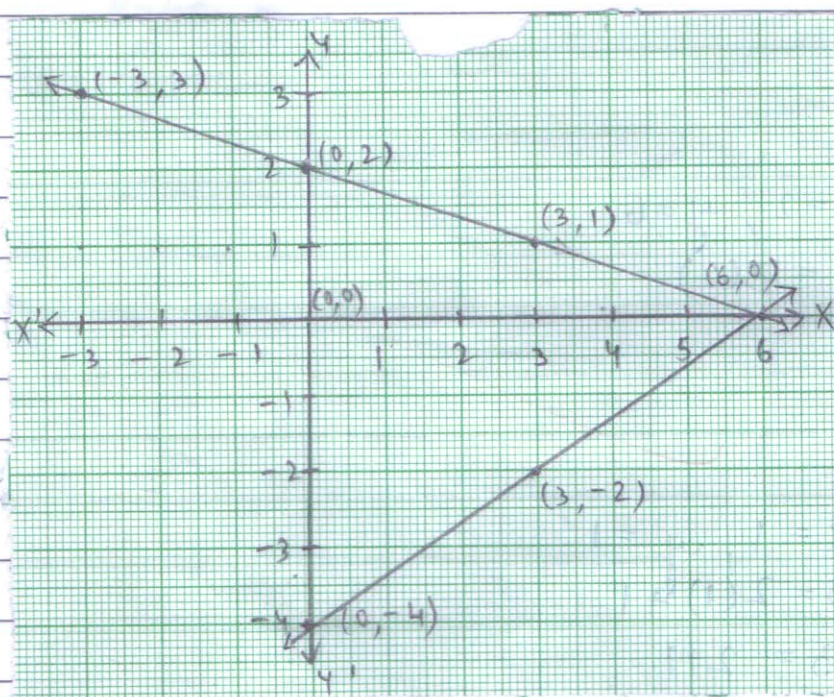


Q.35 $x + 3y = 6$
 $x = 6 - 3y$

x	3	0	-3
y	1	2	3

$2x - 3y = 12$
 $x = \frac{12 + 3y}{2}$

x	6	3	0
y	0	-2	-4



∴ The two lines meet Y-axis at (0, 2) & (0, -4)

Q.37(ii) $y = x$

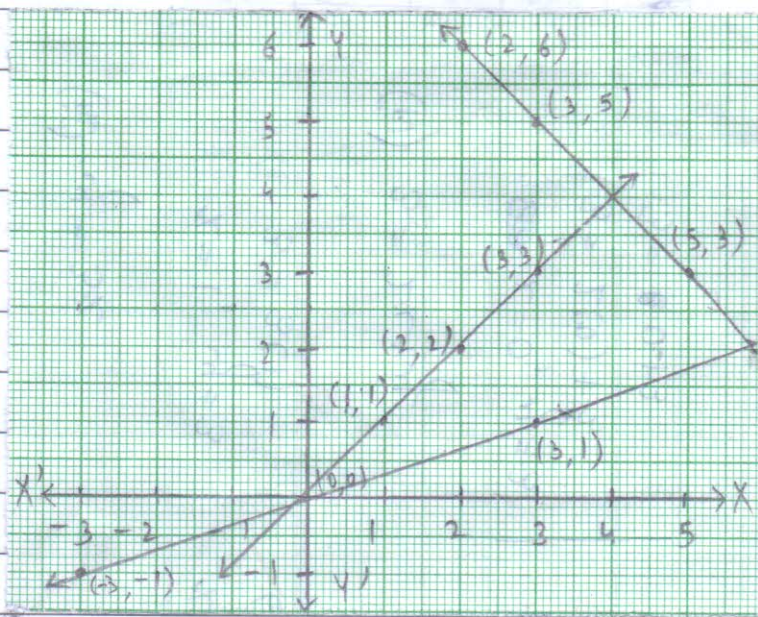
x	1	2	3
y	1	2	3

$3y = x$

x	0	3	-3
y	0	1	-1

$x + y = 8$
 $x = 8 - y$

x	5	2	3
y	3	6	5



∴ The vertices of Δ formed are $(0,0)$, $(4,4)$ & $(6,2)$

Q.38

$$2x + y = 6$$

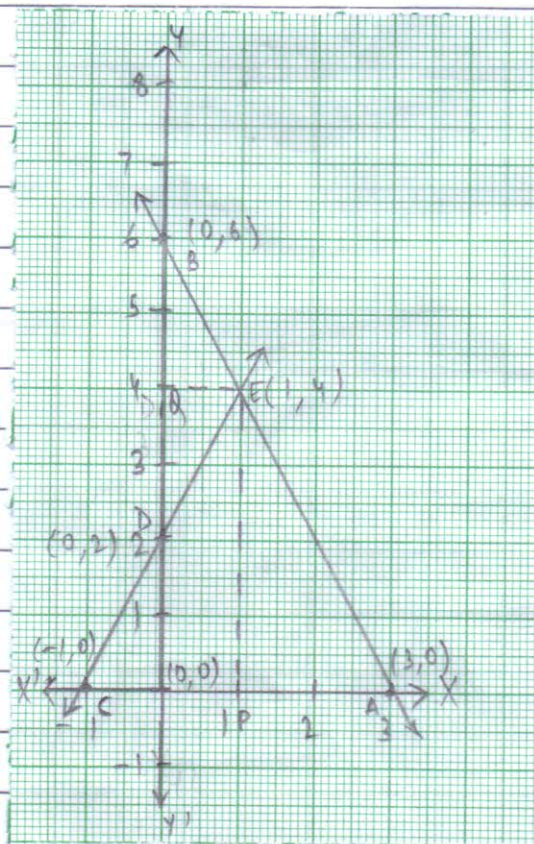
$$y = 2x + 6$$

x	0	3	1
y	6	0	8

$$2x - y + 2 = 0$$

$$y = 2x + 2$$

x	0	-1	1
y	2	0	4



$$\text{Area of } \triangle ACE = \frac{1}{2} \times AC \times PE = \frac{1}{2} \times 4 \times 4 = 8 \text{ sq. units}$$

$$\text{Area of } \triangle BDE = \frac{1}{2} \times BD \times QE = \frac{1}{2} \times 4 \times 1 = 2 \text{ sq. units}$$

$$\frac{\text{ar}(\triangle ACE)}{\text{ar}(\triangle BDE)} = \frac{8}{2} = \frac{4}{1}$$

$$\text{Ratio} = \boxed{4:1}$$

Q.39 $y = x$

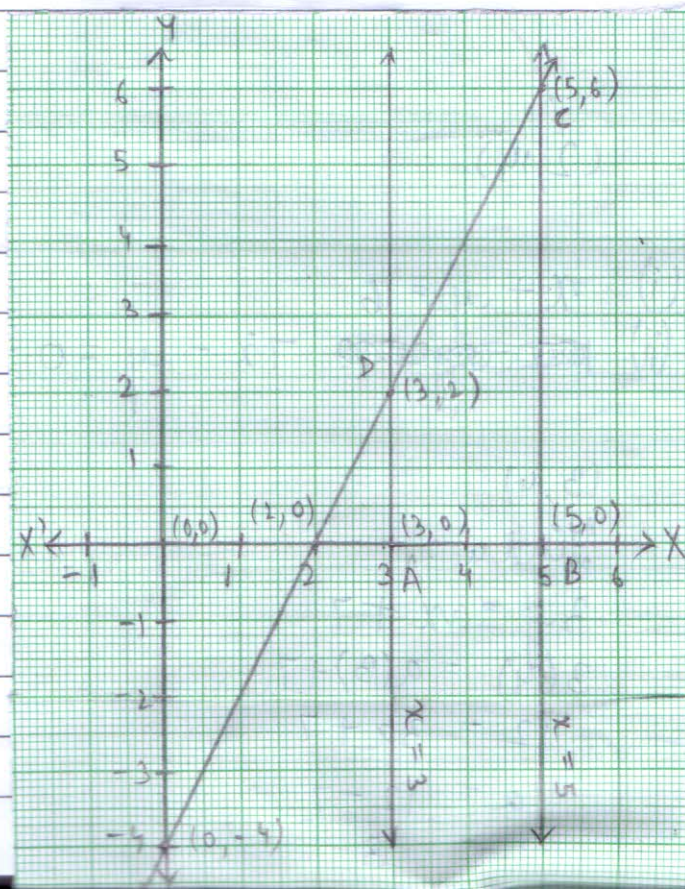
x	0	1	2
y	0	1	2

Q.40 $x = 3, x = 5$

$$2x - y - 4$$

$$y = 2x - 4$$

x	2	3	5	0
y	0	2	6	-4

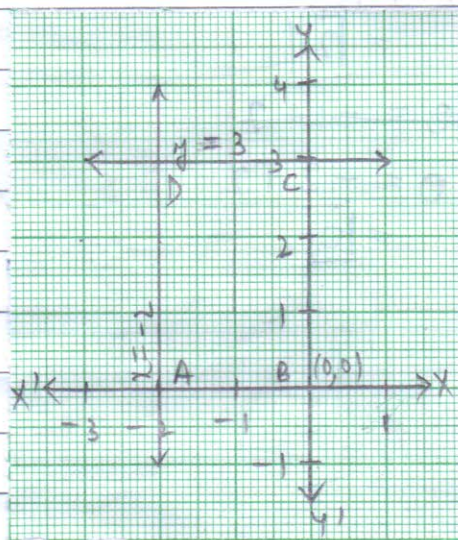


$$\begin{aligned} \text{Area of quad. } ABCD &= \frac{1}{2} \times h \times (\text{sum of || sides}) = \frac{1}{2} \times 2 \times (6+2) \\ &= \boxed{8 \text{ sq. units}} \end{aligned}$$

Q. 41

$$x = -2$$

$$y = 3$$



$$\begin{aligned} \text{Area of rectangle } ABCD &= AB \times AD \\ &= 2 \times 3 \\ &= \boxed{6 \text{ sq. units}} \end{aligned}$$