

Q. Pg. 104, Q. IV, 1]

→ Maximize  $Z = 5x_1 + 6x_2$ 

$$2x_1 + 3x_2 = 18$$

$$(x) x_1 \quad (y) x_2$$

$$0 \quad 6$$

$$9 \quad 0$$

$$2x_1 + x_2 = 12$$

$$(x) x_1$$

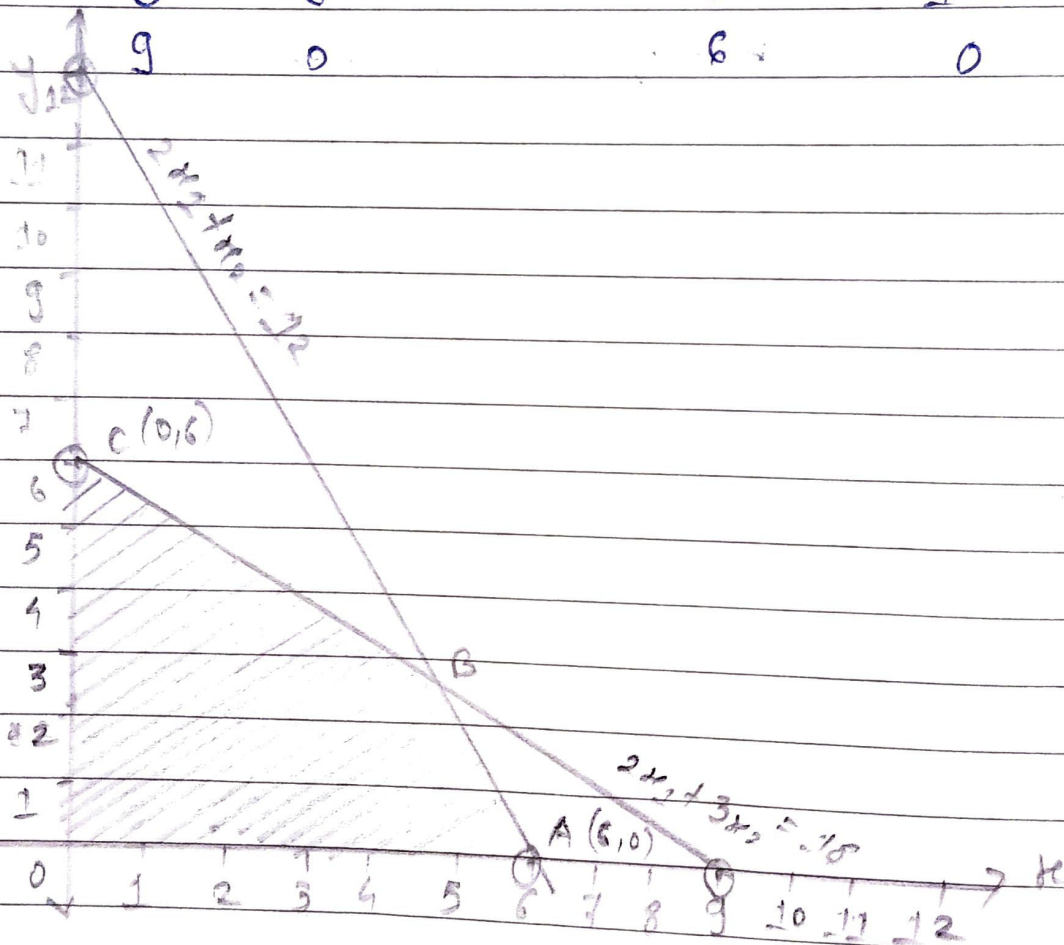
$$x_2 (y)$$

$$0$$

$$12$$

$$6$$

$$0$$



$$2x_1 + 3x_2 = 18$$

$$2x_1 + x_2 = 12$$

$$2x_2 = 6$$

$$x_2 = 3$$

Put in eqn

$$2x_1 + x_2 = 12$$

$$2x_1 = 9$$

$$x_1 = 4.5$$

Vertex

Value

Maximize  $Z$ 

$$= 5x_1 + 6x_2$$

A (6,0)

$$Z = (6)(5) + 0(0) = 30$$

B (4.5, 3)

$$Z = 5(4.5) + 6(3) = 40.5$$

C (0,6)

$$Z = 5(0) + 6(6) = 36$$

O (0,0)

$$Z = 5(0) + 6(0) = 0$$

 $\therefore Z$  is maximum at  $x_1 = 4.5$  and  $x_2 = 3$ .

\* Homework question

2] Pg. 104, Q. IV, 5]

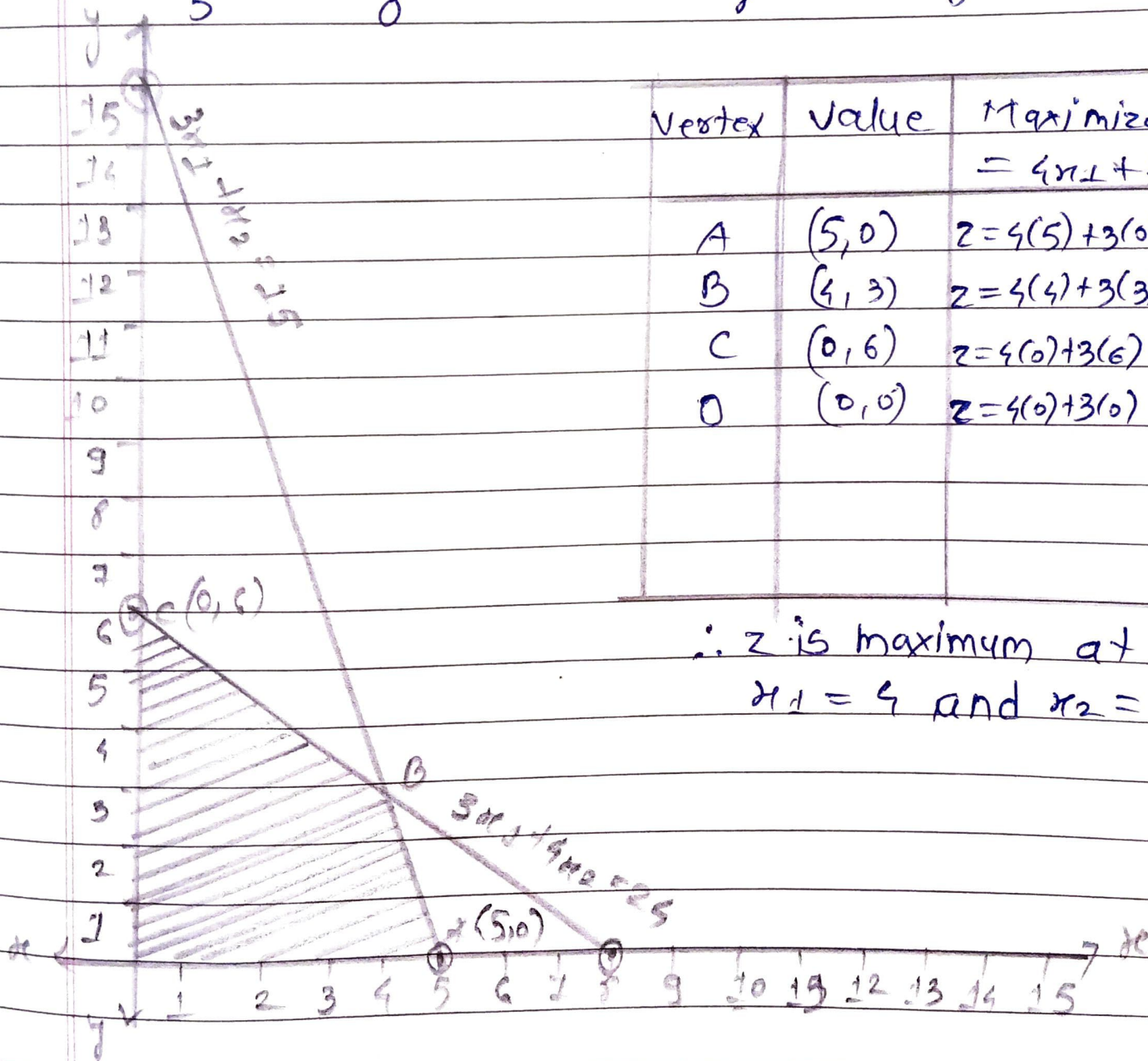
→ Maximize  $Z = 4x_1 + 3x_2$

$$3x_1 + x_2 = 15$$

(x) $x_1$	$x_2$ (y)
0	15
5	0

$$3x_1 + 4x_2 = 24$$

(x) $x_1$	$x_2$ (y)
0	6
8	0



Vertex	Value	Maximize $Z = 4x_1 + 3x_2$
A	(5, 0)	$Z = 4(5) + 3(0) = 20$
B	(4, 3)	$Z = 4(4) + 3(3) = 25$
C	(0, 6)	$Z = 4(0) + 3(6) = 18$
O	(0, 0)	$Z = 4(0) + 3(0) = 0$

∴  $Z$  is maximum at  $x_1 = 4$  and  $x_2 = 3$ .

$$\begin{aligned}
 3x_1 + 4x_2 &= 24 \\
 -3x_1 + x_2 &= 15 \\
 \hline
 3x_2 &= 9 \\
 \boxed{x_2} &= \boxed{3}
 \end{aligned}$$

$$\begin{aligned}
 \text{Put in eqn} \\
 3x_1 + x_2 &= 15 \\
 3x_1 &= 12 \\
 \boxed{x_1} &= \boxed{4}
 \end{aligned}$$