

LINEAR PROGRAMMING شرح بسيط ل

Q7. Solve the following LPP by graphical method:

$\max z = 13x_1 + 11x_2$ subject to:

$$4x_1 + 5x_2 \leq 1500$$

$$5x_1 + 3x_2 \leq 1575$$

$$x_1 + 2x_2 \leq 420$$

$$x_1, x_2 \geq 0$$

Solution:

$$4x_1 + 5x_2 = 1500$$

$$4(0) + 5x_2 = 1500$$

$$5x_2 = 1500$$

$$x_2 = \frac{1500}{5} = 300$$

x_1	0	375
x_2	300	0

$$4x_1 + 5(0) = 1500$$

$$4x_1 = 1500$$

$$x_1 = \frac{1500}{4} = 375$$

$$5x_1 + 3x_2 = 1575$$

$$5(0) + 3x_2 = 1575$$

$$5x_2 = 1575$$

$$x_2 = \frac{1575}{3} = 525$$

x_1	0	315
x_2	525	0

$$5x_1 + 3x_2 = 1575$$

$$5x_1 + 3(0) = 1575$$

$$x_1 = \frac{1575}{5} = 315$$

$$x_1 + 2x_2 = 420$$

$$(0) + 2x_2 = 420$$

$$x_2 = \frac{420}{2} = 210$$

x_1	0	420
x_2	210	0

$$x_1 + 2x_2 = 420$$

$$x_1 + 2(0) = 420$$

$$x_1 = 420$$

$$x_1 + 2x_2 = 420 \quad \text{multiple 5}$$

$$5x_1 + 3x_2 = 1575 \quad \text{multiple -1}$$

$$5x_1 + 10x_2 = 2100$$

$$\underline{-5x_1 - 3x_2 = -1575}$$

$$7x_2 = 525$$

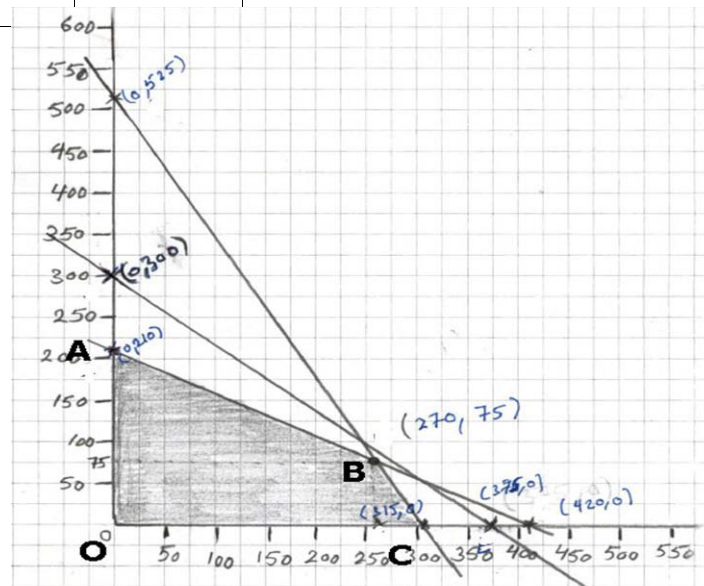
$$x_2 = \frac{525}{7} = 75$$

$$x_1 + 2(75) = 420$$

$$x_1 + 150 = 420$$

$$x_1 = 420 - 150$$

$$x_1 = 270$$



Draw the table:

crone	$z = 13x_1 + 11x_2$
A=(0,210)	$13(0)+11(210)=2310$
O=(0,0)	$13(0)+11(0)= 0$
C=(315,0)	$13(315)+11(0)=4095$
B=(270,75)	$13(270)+11(75)=4335$

Maximum value of 4335 point B (270,75)

EMMS