

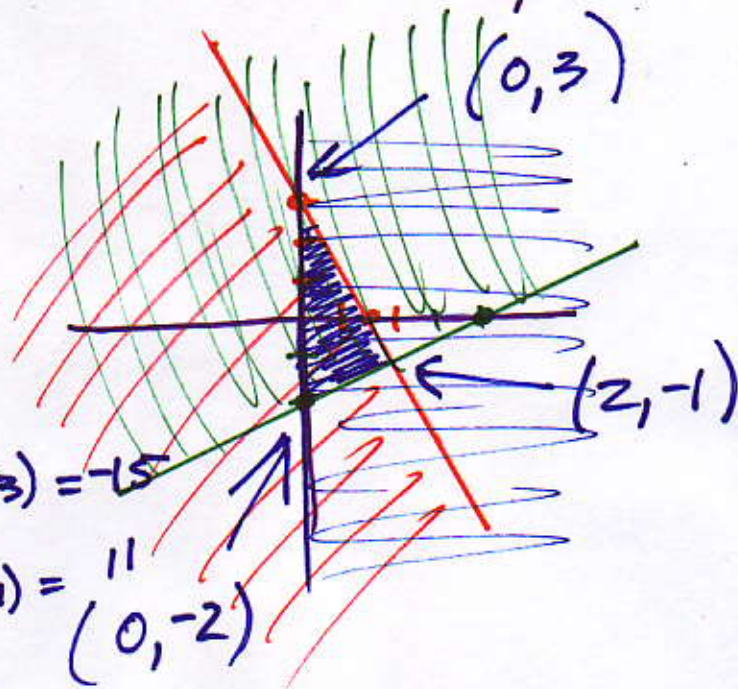
LINEAR PROGRAMMING P. 504-511

1. LINEAR PROGRAMMING: A MODELING TECHNIQUE USED TO DETERMINE MAXIMUM & MINIMUM VALUES FOR A GIVEN OBJECTIVE FUNCTION.
(OPTIMIZE: PROFIT, OFFICE SPACE, ...)
2. OBJECTIVE FUNCTION: LINEAR EQUATION OF THE FORM: $Z = Ax + By$
3. SET OF CONSTRAINTS: A SYSTEM OF LINEAR INEQUALITIES (SEC 6.4)
4. FEASIBLE REGION: GRAPH OF THE SYSTEM OF LINEAR INEQUALITIES
5. VERTICES: INTERSECTION POINTS OF THE FEASIBLE REGION.

EXAMPLE :

OBJECTIVE FUNCTION: $z = 3x - 5y$

CONSTRAINTS $\left\{ \begin{array}{l} 2x + y \leq 3 \\ x - 2y \leq 4 \\ x \geq 0 \end{array} \right.$



MIN $(0, 3)$ $z = 3(0) - 5(3) = -15$

MAX $(2, -1)$ $z = 3(2) - 5(-1) = 11$

$(0, -2)$ $z = 3(0) - 5(-2) = 10$

$(0, 3)$	IS	THE	MIN	OF	-15
$(2, -1)$	"	"	MAX	OF	11

13. OBJECTIVE FUNCTION: $z = 60x + 75y$

CONSTRAINTS

$$\left\{ \begin{array}{l} x \geq 0 \\ y \geq 0 \\ x + y \leq 100 \\ \frac{350}{5}x + \frac{500}{5}y \leq \frac{41,000}{5} \end{array} \right\}$$

$$\begin{array}{r} -10 \quad -10 \quad -10 \\ x + y = 100 \\ 7x + 10y = 820 \\ -10x - 10y = -1000 \\ \hline -3x = -180 \\ \hline x = 60 \end{array}$$

$$7x + 10y \leq 820$$

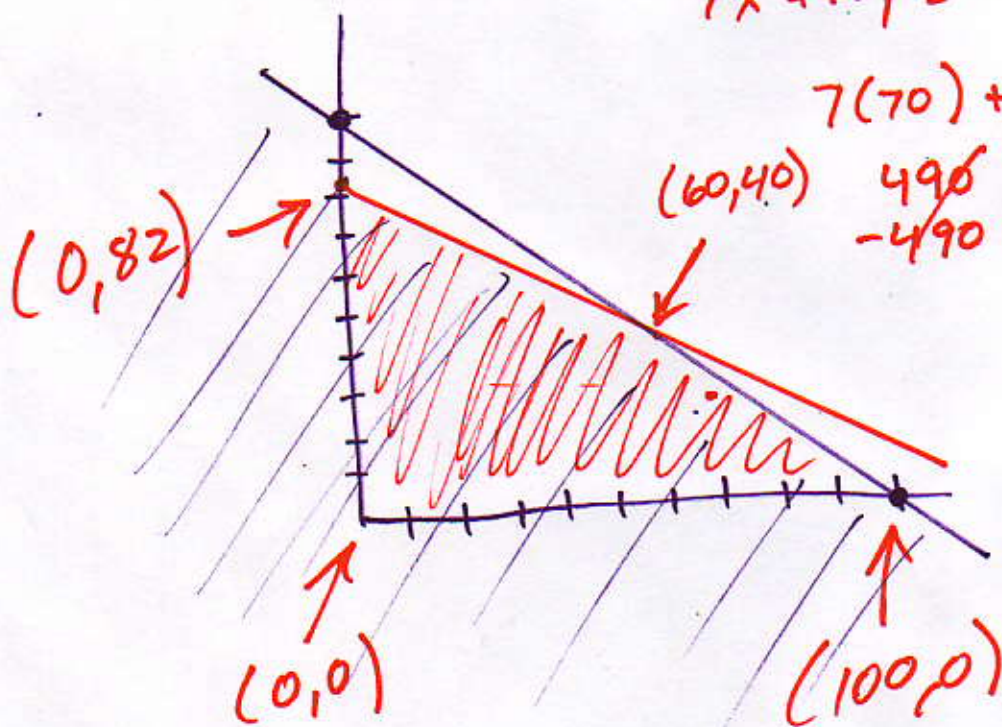
$$7(70) + 10y \leq 820$$

$$(60, 40) \quad 490 + 10y \leq 820$$

$$-490$$

$$\frac{10y}{10} \leq \frac{330}{10}$$

$$y \leq 33$$



$(0,0)$	$z = 60(0) + 75(0) = 0$
$(100,0)$	$z = 60(100) + 75(0) = 6000$
$(0,82)$	$z = 60(0) + 75(82) = 6150$
$(60,40)$	$z = 60(60) + 75(40) = \$6600$

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