

**Linear Programming Guide**

Name: 5.6 Hour: \_\_\_\_\_

Problem Number # 85

	food x	clothing y	total
Weight	40	10	$\leq 16,000$
Volume	20	30	$\leq 18,000$
Helps	10	8	

a) Identify the variables.

X = # cartons food  
Y = # cartons clothing

b) What are we trying to maximize/minimize?

# people assisted

c) Objective Function (max/min?)

$$10x + 8y$$

d) List all the Constraints (inequalities)

$$x \geq 0 \quad y \geq 0$$

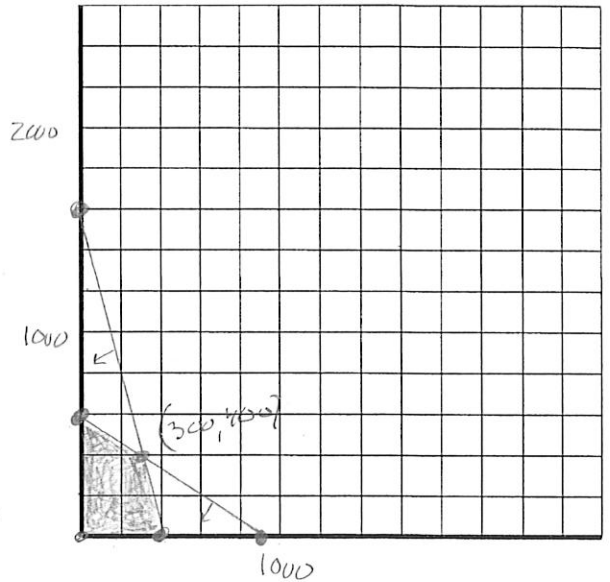
$$40x + 10y \leq 16,000$$

$$20x + 30y \leq 18,000$$

$$\begin{array}{r|l} x & y \\ 40 & 10 \\ \hline 0 & 16000 \end{array} \rightarrow$$

$$\begin{array}{r|l} x & y \\ 20 & 30 \\ \hline 0 & 18000 \end{array} \rightarrow$$

e) Graph all inequalities creating a Feasible Region.



f) List the vertices of the Feasible Region.

(400, 0) (300, 400) (0, 600)

g) Give the value of the Objective Function at each vertex.

$$(400, 0) = 10(400) + 8(0) = 4000$$

$$(300, 400) = 10(300) + 8(400) = 3000 + 3200 = \boxed{6200}$$

$$(0, 600) = 10(0) + 8(600) = 4800$$

$$(0, 0) = 10(0) + 8(0) = 0$$

$$( , ) =$$

$$\begin{array}{r} 40x + 10y = 16,000 \\ -40x - 60y = -36,000 \\ \hline -50y = -20,000 \\ \hline -50 \quad -50 \end{array}$$

$$y = 400$$

$$40x + 10(400) = 16,000$$

$$\begin{array}{r} 40x + 4000 = 16,000 \\ -4000 \quad -4,000 \end{array}$$

$$\begin{array}{r} 40x = 12,000 \\ \hline 40 \quad 40 \end{array}$$

$$x = 300$$

h) Answer the question.

A maximum of 6200 people can be helped by sending 300 cartons of food and 400 cartons of clothing.