1

a) $\begin{cases} 2x + 4y \geq 16 \\ -x + 3y \geq 7 \end{cases}$

$2x + 4y = 16$

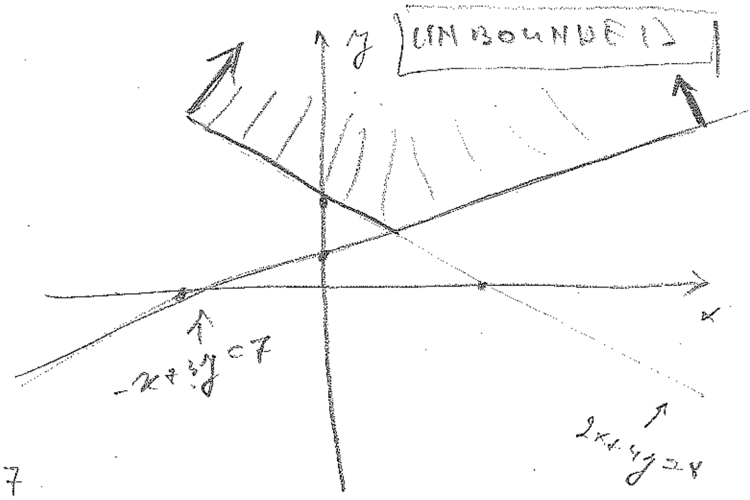
x	0	8
y	4	0

$2\cdot 0 + 4\cdot 0 < 16$

$-x + 3y = 7$

x	0	-7
y	7/3	0

$-0 + 3\cdot 0 < 7$



b) $\begin{cases} x + y \geq 2 \\ 3x - y \geq 5 \end{cases}$

$x + y = 2$

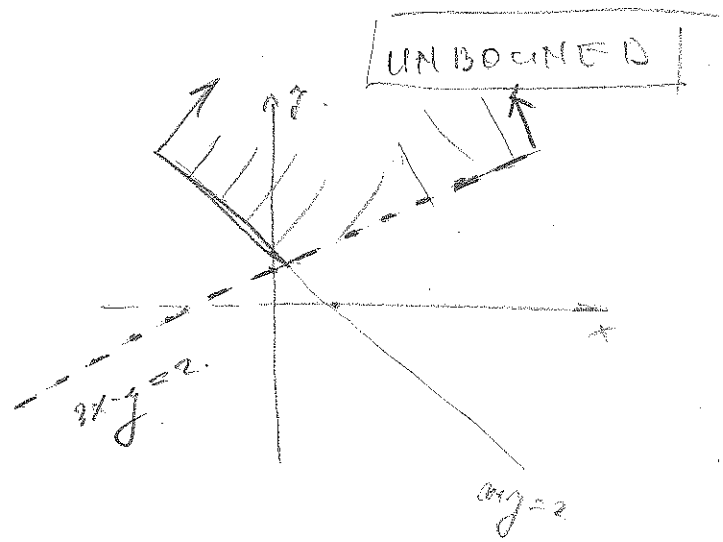
x	0	2
y	2	0

$0 + 0 < 2$

$3x - y = 5$

x	0	5/3
y	-5	0

$0 - 0 < 5$



c) $\begin{cases} 3x + 4y \geq 12 \\ 2x - y \geq 2 \\ 0 \leq y \leq 3 \\ x \geq 0 \end{cases}$

$3x + 4y = 12$

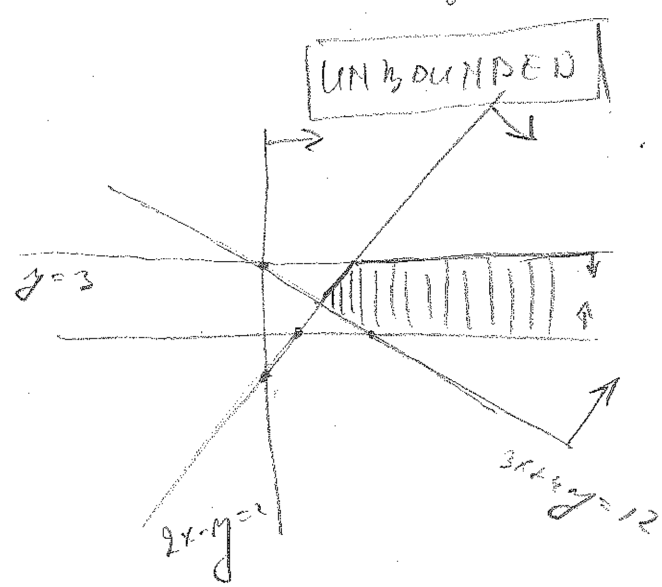
x	0	4
y	3	0

$0 + 0 < 12$

$2x - y = 2$

x	0	1
y	-2	0

$0 - 0 < 2$



[2] We can organize the information given in the following table:

	X GP	Y St.B.	Total
plush	1.5	2	3600
stuffing	30	35	6600
trim	5	8	13600

The linear programming is:

max $10X + 15y$

$1.5X + 2y \leq 3600$

$30X + 35y \leq 6600$

$5X + 8y \leq 36000$

[3] Let organize the information where, for instance, X_1 is the cost of transporting plant I to W. A. Similarly $X_2, \ldots, X_6$.

	Plant I	Plant II	Total
Warehouse A	X_1	X_2	200
W.B.	X_3	X_4	150
W. C	X_5	X_6	200
Total	300	250	

linear programming

min $60X_1 + 80X_2 + 60X_3 + 70X_4 + 80X_5 + 50X_6$

$X_1 + X_2 \leq 200$

$X_3 + X_4 \leq 150$

$X_5 + X_6 \leq 200$

$X_1 + X_3 + X_5 \leq 300$

$X_2 + X_4 + X_6 \leq 250$

[4]

	X A	Y B	
I	6	9	5·60 min
II	5	4	3·60 min

linear programming

max $3X + 4y$

$6X + 9y \leq 300$ min

$5X + 4y \leq 180$ min

$X \geq 0, \; y \geq 0$.

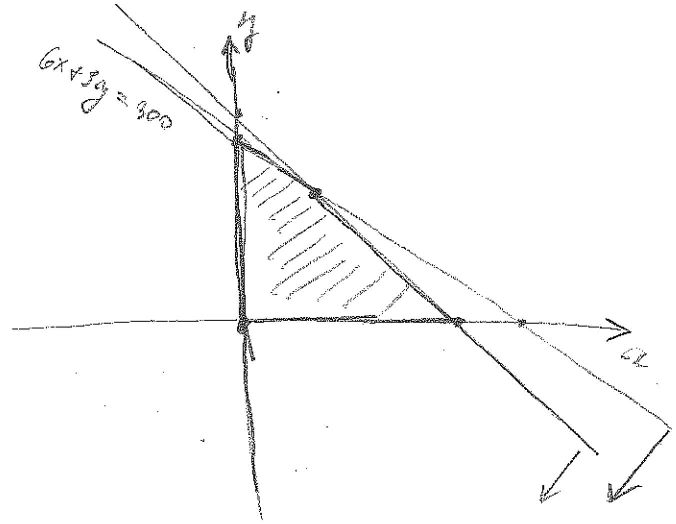
Graphical solution.

$6x + 9y = 300$

x	0	50
y	$\frac{300}{9}$	0

$5x + 4y = 180$

x	0	45
y	36	0



To find the maximum of $3x + 4y$ we use the vertex method

We need to check:

$(0,0) \longrightarrow 0$

$(0,45) \longrightarrow 180$

$\left(0, \frac{300}{9}\right) \longrightarrow 133.3$

For the last vertex: $\begin{cases} 6x + 9y = 300 & (5) \\ 5x + 4y = 180 & (6) \end{cases} \Rightarrow \begin{cases} 30x + 45y = 1500 \\ 30x + 24y = 1080 \end{cases}$

$19y = 420 \Rightarrow y = \frac{420}{19} \approx 22 \Rightarrow x = \frac{300 - 198}{6} = 17$

$(17, 22) \longrightarrow 3 \cdot 17 + 4 \cdot 22 = 139$

The maximum value is 180