1

Point	$21x+26y$
(4,6)	240 ←
(6,4)	230
(2,7)	224

a) The maximum value is 240.

b) It occurs at (4,6).

2

	Backpacks (x)	Purses (y)	Available
Manufacture (hours)	4	3	96
Test (hours)	2	1	40
Revenue ($)	50	70	////////

a) Daily Revenue $= 50x + 70y$

b)

$4x + 3y \le 96$ ← maximum available

$2x + y \le 40$

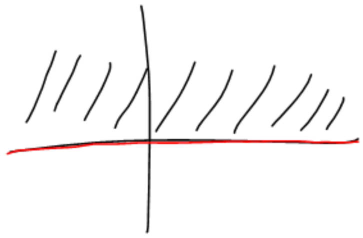
$x \geq 0$

$y \geq 0$

(3)

$y = 0$

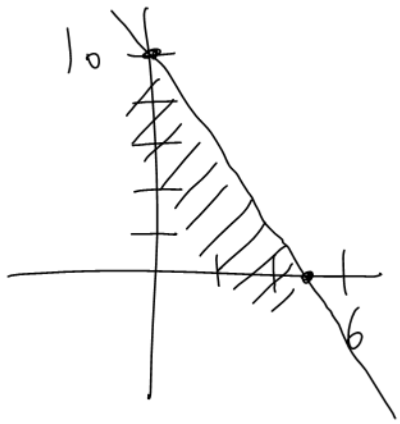
(horizontal line)



Test $(0,1)$: YES

$2x + y = 10$

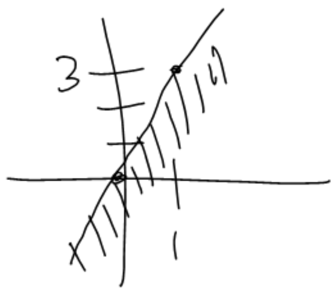
2 points: $(0,10)$, $(5,0)$



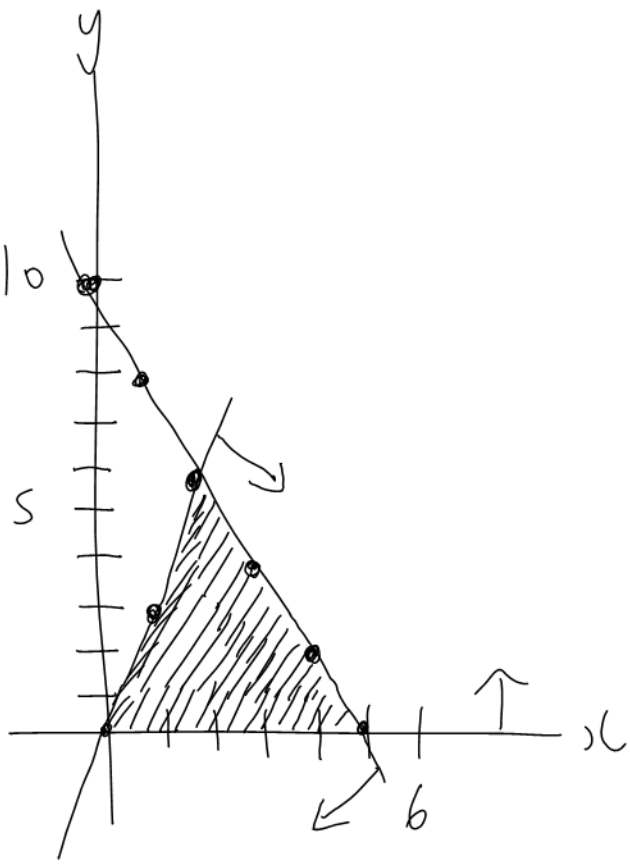
Test $(0,0)$: YES

$y = 3x$

2 points: $(0,0)$, $(1,3)$



Test $(1,0)$: YES



④ Cost line for Manufacturer A:

$$y = mx + b$$
$$y = 4x + 561$$

Cost line for Manufacturer B:

$$y = mx + b$$
$$y = 7x + 210$$

a)
$$y = y$$
$$4x + 561 = 7x + 210$$
$$351 = 3x$$
$$117 = x$$

$\boxed{117 \text{ units}}$

b) $x = 117 \rightarrow$ either line
$$y = 4(117) + 561$$
$$y = 1029$$

$\boxed{\$1029}$

5 $15x - 3y \le 9$

$-3y \le -15x + 9$

Divide by -3:

$$\frac{-3y}{-3} \ge \frac{-15x}{-3} + \frac{9}{-3}$$

$$y \ge 5x - 3$$

6 We are given 2 points on the cost line:
$(10, 400)$ and $(17, 498)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{(498 - 400)}{(17 - 10)}$$

$$= \frac{98}{7}$$

$$= 14$$

$y = mx + b$

$y = 14x + b$

Sub $x = 10, y = 400$: $400 = 140 + b$

$260 = b$

$\boxed{y = 14x + 260}$

(7)

$$\begin{array}{c} \begin{array}{cccc} x & y & z & \# \end{array} \\ \left[\begin{array}{ccc|c} 1 & -3 & 5 & 13 \\ 2 & -5 & 8 & 22 \\ -2 & 2 & 3 & 5 \end{array}\right] \end{array}$$

$$\begin{array}{l} \\ R_2-2R_1 \\ R_3+2R_1 \end{array} \left[\begin{array}{ccc|c} 1 & -3 & 5 & 13 \\ 0 & 1 & -2 & -4 \\ 0 & -4 & 13 & 31 \end{array}\right]$$

$$\begin{array}{l} R_1+3R_2 \\ \\ R_3+4R_2 \end{array} \left[\begin{array}{ccc|c} 1 & 0 & -1 & 1 \\ 0 & 1 & -2 & -4 \\ 0 & 0 & 5 & 15 \end{array}\right]$$

$$\begin{array}{l} \\ \\ \frac{R_3}{5} \end{array} \left[\begin{array}{ccc|c} 1 & 0 & -1 & 1 \\ 0 & 1 & -2 & -4 \\ 0 & 0 & 1 & 3 \end{array}\right]$$

$$\begin{array}{l} R_1+R_3 \\ R_2+2R_3 \\ \\ \end{array} \left[\begin{array}{ccc|c} 1 & 0 & 0 & 4 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 3 \end{array}\right]$$

$x = 4$
$y = 2$
$z = 3$

or $(x,y,z) = (4,2,3)$