

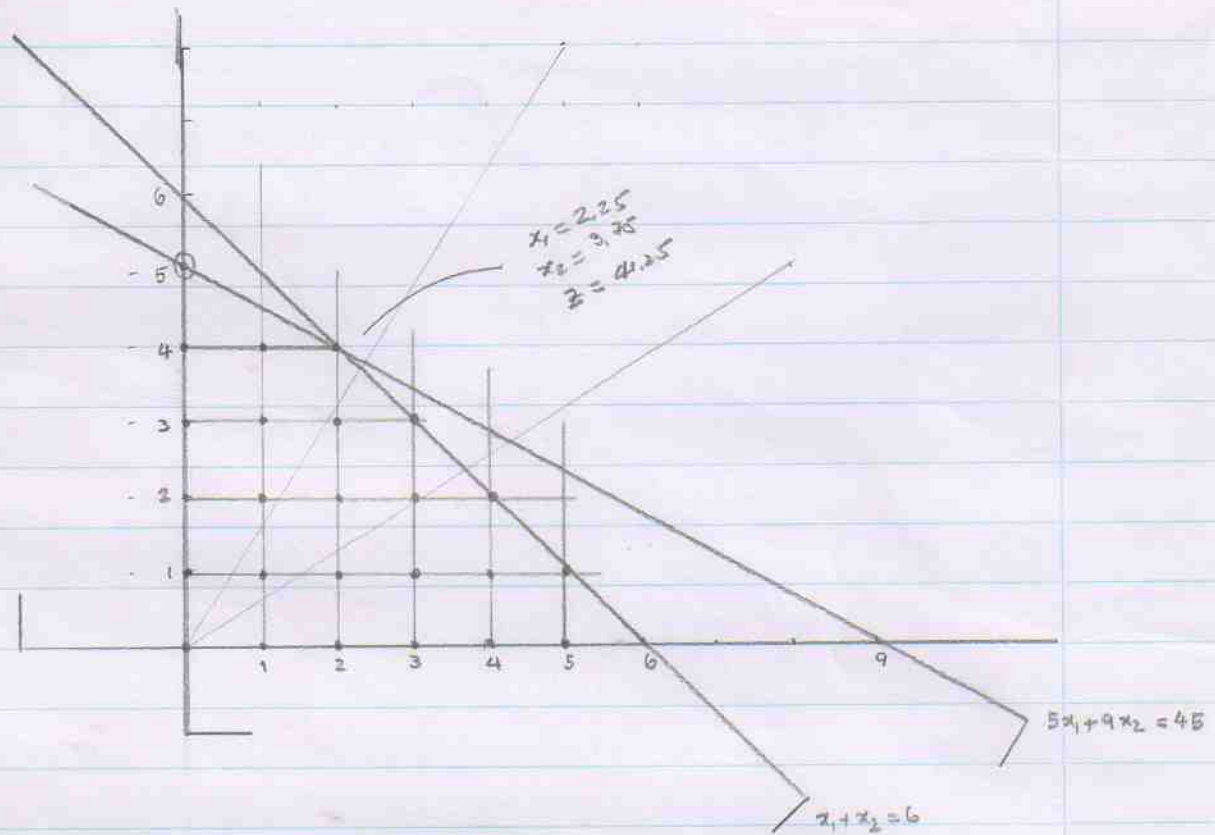
1A

$$\text{Max } z = 5x_1 + 8x_2$$

s.a.

$$x_1 + x_2 \leq 6$$

$$5x_1 + 9x_2 \leq 45$$

 $x_1, x_2 \geq 0$ e inteiros


a) redução contínua : $x_1 + x_2 = 6 \Rightarrow -5x_1 - 5x_2 = -30$
 $5x_1 + 9x_2 = 45$

$$4x_2 = 15 \Rightarrow x_2 = 15/4 = 3.75$$

$$x_1 = \frac{9}{4} = 2.25$$

$$x^* = (x_1, x_2)^t = \left(\frac{9}{4}, \frac{15}{4}\right)^t = (2.25, 3.75)^t$$

$$z^* = 41.25$$

2A

$$\begin{aligned} \text{Max } Z &= 1000000 x_1 + 200000 x_2 + 300000 x_3 + 400000 x_4 \\ &+ 450000 x_5 + 450000 x_6 - 500000 x_1 - 150000 x_2 \\ &- 300000 x_3 - 250000 x_4 - 250000 x_5 - 100000 x_6 \\ &= 500000 x_1 + 50000 x_2 + 0 x_3 + 150000 x_4 + 200000 x_5 \\ &+ 350000 x_6 \end{aligned}$$

subject a

$$500000 x_1 + 150000 x_2 + 300000 x_3 + 250000 x_4 + 250000 x_5 +$$

$$100000 x_6 \leq 1800000$$

$$700 x_1 + 250 x_2 + 200 x_3 + 200 x_4 + 300 x_5 + 400 x_6 \leq 1500$$

$$200 x_1 + 100 x_2 + 100 x_3 + 100 x_4 + 100 x_5 + 100 x_6 \leq 1200$$

$$x_j = \begin{cases} 1, & \text{se pas paganda } j \text{ for usada} \\ 0, & \text{c.c.} \end{cases}$$

2A : $x_1 \rightarrow TV$

$x_2 \rightarrow RE$

$x_3 \rightarrow \text{Jornal}$

$x_4 \rightarrow \text{Rádío}$

$x_5 \rightarrow RP$

$x_6 \rightarrow \text{Falders}$

(i) $x_4 + x_5 \geq x_6$

(ii) $x_2 + x_5 \leq 1$

(iii) $x_1 + x_2 + x_3 + x_4 + x_5 + x_6 \leq 4$

(iv) $x_4 \leq 1 - \left(\frac{x_1 + x_3}{2} \right)$ ou $2x_4 \leq 2 - x_1 - x_3$

3A Max $Z = 3x_1 + 4x_2 + 5x_3 + 8x_4 + 10x_5$
 sa

$$6x_1 + 4x_2 + 5x_3 + 6x_4 + 9x_5 \leq 16$$

$$x_j \in [0, 1]$$

	c_j	a_j	c_j/a_j	
1	3	6	$3/6 = 1/2 = 0.5$	-5
2	4	4	1	-3
3	5	5	1	-4
4	8	6	$4/3 = 1.33$	-1
5	10	9	$10/9 = 1.11$	-2

$$b^0 = 16$$

$$x_4 = 1$$

$$b^1 = 16 - 6 = 10$$

$$x_5 = 1$$

$$b^2 = 10 - 9 = 1$$

$$x_2 = 1$$

$$b^3 = 1 - 4 = -3 \Rightarrow x_2 = 1/4$$

$$x_3 = 1/5 \text{ or } x_2 = 1/4$$

$$x^* = (x_1, x_2, x_3, x_4) = (0, 1/4, 0, 1)$$

$$(0, 0, 1/5, 1, 1)$$

$$Z^* = 4 \times \frac{1}{4} + 8 + 10 = 19$$