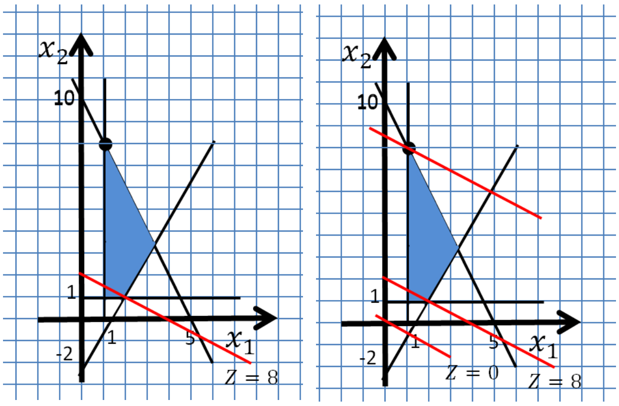
1.a)

x_1 Tones of C1 to produce weekly

x_2 Tones of C2 to produce weekly

1.b) and 1.**c)** $8 = 2x_1 + 4x_2$ 1.**d)** $\begin{cases} x_1 = 1 \\ 2x_1 + x_2 = 10 \end{cases} (\ldots) \begin{cases} x_1 = 1 \\ x_2 = 8 \end{cases} \; z = 34$



1.e) A: BNFS; B: NBNFS; C: BFS optimal; D: NBFS.

f) $Min\ W = 10y_1 + 2y_2 + y_3 + y_4$

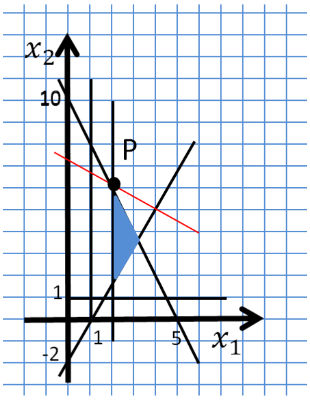
$$s.t. \begin{cases} 2y_1 + 2y_2 + y_3 \geq 2 \\ y_1 - y_2 + y_4 \geq 4 \\ y_1, y_2 \geq 0 \\ y_3, y_4 \leq 0 \end{cases}$$

g) $y_3 = \Delta Z$ if $\Delta b_3 = +1$

New problem:

$Max\ Z = 2x_1 + 4x_2$

$$s.t. \begin{cases} 2x_1 + x_2 \leq 10 \\ 2x_1 - x_2 \leq 2 \\ x_1 \geq 2 \\ x_2 \geq 1 \\ x_1, x_2 \geq 0 \end{cases}$$



New optimal solution: point P

$$\begin{cases} x_1 = 2 \\ 2x_1 + x_2 = 8 \end{cases} \quad (\ldots) \quad \begin{cases} x_1 = 2 \\ x_2 = 6 \end{cases} \Rightarrow \ Novo\ z = 28$$

$y_3 = \Delta Z = 28 - 34 = -6$; $y_3 = -6 \leq 0$ This is accordingly to the dual

y_3: Each unit of C1 that the company is forced to produce above (below) the current minimum required (that is one unit), the profit decreases (increases) 6 m. u. ($= -y_3$), while the optimal basis is maintained.

2. a)

	Z	x_1	x_2	x_3	x_4	x_5	RHS
z	1	0	0	0	-4	-1	6
x_1	0	1	0	0	0	-1/5	1
x_3	0	0	0	1	2	3/5	6
x_2	0	0	1	0	(2)	3/5	4
z	1	0	2	0	0	1/5	14
x_1	0	1	0	0	0	-1/5	1
x_3	0	0	-1	1	0	0	2
x_4	0	0	1/2	0	1	3/10	2

Entering criteria

$Min\{-4, -1\} = -4$

x_4 new basic

Leaving criteria

$Min\left\{\frac{6}{2}, \frac{4}{2}\right\} = 2$

x_2 new non basic

b) $x = (1,0,2,2,0)$. Optimal BFS.