

## Optimizing Methods

### Fourth List of Problems

1. For PLP

$$f(x_1, x_2, x_3, x_4, x_5) = -30x_1 + 24x_2 + 20x_3 + 20x_4 + 25x_5 \rightarrow \max$$

subject to:

$$\begin{aligned} -3x_1 + x_2 + 2x_3 + 3x_4 + 5x_5 &\leq 19 \\ -3x_1 + 4x_2 + 3x_3 + 2x_4 + x_5 &\leq 57 \end{aligned}$$

with  $x_j \geq 0$ , for  $j = 1, 2, \dots, 5$ , show that

$$\forall_{(x_1, x_2, \dots, x_5) \in D} f(x_1, x_2, x_3, x_4, x_5) \leq 351.$$

2. Write DLP if PLP has the form

$$F(x_1, x_2) = x_1 + 2x_2 \longrightarrow \max$$

subject to:

$$\begin{aligned} -x_1 + x_2 &\leq 1 \\ x_1 - 2x_2 &\leq 0 \\ x_1 + x_2 &\leq 3, \end{aligned}$$

where  $x_1, x_2 \geq 0$ .

3. We know that  $(1, 2)$  is a solution of the PPL given in the task 2. Show that  $(3/2, 0, 1/2)$  is a solution of DPL.