

## Exercise session 1

### Problem 1

Solve

$$\begin{aligned} \max \quad & 3x_1 + kx_2 && \text{(LP)} \\ \text{s.t.} \quad & x_1 + 2x_2 \leq 8 \\ & 2x_1 + x_2 \leq 7 \\ & x_1 \geq 0, \quad x_2 \geq 0, \end{aligned}$$

with the Simplex method for  $k = 1$  and  $k = 2$ .

a) Rewrite (LP) on standard form.

b) Perform Simplex iterations. Start with the slack variables in the basis.

c) What value of  $k$  would give an infinite number of optimal solutions among which there are two optimal basic feasible solutions?