Seminar 2:

The simplex method for LP problems, MS Excel Solver, sensitivity analysis

Problem 1: Use the simplex method to solve the problems:

a) $z = 36x_1 + 12x_2 + 60x_3 \rightarrow max.$

subject to

$2x_1 + x_2 + 3x_3 \leq 9$

$x_1 + \quad 3x_3 \leq 3$

$x_1, \ x_2, \ x_3 \geq 0$

b) $z = x_1 + 2x_2 \rightarrow max.$

subject to

$x_1 - x_2 \leq 12$

$-2x_1 + x_2 \leq 8$

$x_1, \ x_2, \ \geq 0$

c) $z = 3x_1 - x_2 \rightarrow max.$

subject to

$3x_1 + x_2 \leq 3$

$3x_1 - 4x_2 \geq 12$

$-2x_1 + x_2 \geq 6$

$x_1, \ x_2, \ \geq 0$

Problem 2: Solve Problem 1 of Seminar 1 using computer.

Problem 3: Use Excel Solver to check the solution of the problem 1a)

Supplementary Tasks:

- Find intervals of stability for prices and capacities in Solver Sensitivity report.

- Formulate the dual problem.

- Find the solution of the dual in the Solver Reports.

- Find the solution of the dual in the simplex table.

- Solve the dual problem and compare the optimal values of primal and dual problems.