Linear Programs – PROL

Final Exam

Duration of the exam : 1h30.
No documents are allowed.
Only *non-programmable* pocket calculators are allowed.

Call L the following linear program :

$$
\begin{aligned}
\text{maximize} \quad & 2x_1 + x_2 + x_3 \\
\text{subject to} \quad & \\
& 2x_1 - x_2 + 2x_3 \le 7 \\
& 2x_1 - 4x_2 \le 12 \\
& -4x_1 + 3x_2 + 8x_3 \le 10 \\
\text{with} \quad & x_1, x_2, x_3 \ge 0.
\end{aligned}
$$

1. Find optimal objective value and an optimal solution to L using the Simplex algorithm.

2. Give the dual linear program to L in standard form, it shall be denoted D.

3. Using previously done work on L, give a slack form of D having optimal basic solution.

4. Getting back to quesiton (2.), write down the slack form of D.

5. Solve linear program D using the Simplex algorithm.

6. Compare slack forms of questions (2.) and (5.) corresponding to optimal basic solutions of D.