

**Math 3200/5200**  
**HOMEWORK PROBLEMS ON SIMPLEX METHOD**

1. Consider the following Linear Programming Problem

$$\begin{array}{ll} \max & x_1 + x_2 \\ \text{s. t.} & x_1 \leq 5 \\ & x_1 + x_2 \leq 6 \\ & -\frac{1}{2}x_1 + x_2 \leq 6 \\ & x_1, x_2 \geq 0 \end{array}$$

Solve it by the Simplex Method (choose  $x_1$  as entering variable in the first tableau). How many optimal solutions are there? How does this reflect in the final simplex tableau? How can you iterate to another optimal basic solution (do it!)?

2. Apply the Simplex Method to solve the following problem:

$$\begin{array}{ll} \max & 2x_1 + 3x_2 - x_3 \\ \text{s. t.} & 2x_1 + 2x_2 - x_3 \leq 10 \\ & 3x_1 - 2x_2 + x_3 \leq 10 \\ & x_1 - 3x_2 + x_3 \leq 10 \\ & x_1, x_2, x_3 \geq 0 \end{array}$$