

MATH 435/ 535 : Homework #5

Do all the following problems. Due Thursday, 2/16, in class before the lecture starts.

All problems require explicit and detailed proofs. Solutions should be written clearly, legibly, and concisely, and will be graded for both mathematical correctness and presentation. Points will be deducted for sloppiness, incoherent or insufficient explanation, or for lack of supporting rationale.

Re-read the “‘Why and How’ of Homework” section of the course information sheet for some advice on the HWs for this course.

Always remember that homework is NOT meant to be an examination, it is meant to assist in your learning and development. If you need help with it, don't hesitate to ask. You can contact me during office hours, or through email.

Below ‘BT x.y’ refers to the corresponding exercise in the course textbook.

1. Consider the following Simplex Tableau:

	2	-2	-3	1	12	0	0
x_5	0	-2	-9	1	9	1	0
x_6	0	$\frac{1}{3}$	1	$-\frac{1}{3}$	-2	0	1

Note that x_5 and x_6 are the current Basic variables.

(a) Apply the Simplex tableau method with the following pivoting rules:

The non-basic variable with the most negative cost enters the Basis, and

In case of ties for the leaving variable, choose the variable corresponding to the row that is higher up in the tableau.

Demonstrate that the Simplex method cycles (i.e., you get the exact same Tableau, and consequently the same Basis, after a few iterations).

(b) Apply the Simplex method with Bland's rule and demonstrate that the Simplex method does not cycle by finding the optimal solution.

2. BT 3.18ab

3. BT 3.19

Comment: In part (a), they are really asking for multiple optimal bases and not multiple optimal solutions.

4. One of the following: BT 3.12 or BT 3.21a.