MA 416
Homework #5
Due Wednesday, March 7

1. Solve 4.6-18 by the Big M method. Save yourself some effort and use Maple or some other package to carry out the pivots (but I want to see the sequence of tables).

2. Solve 4.6-19 by the Big M method, using Maple or some other software (but I want to see the sequence of tables).

3. You are in the process of solving the following linear program:

$$\max 2x_1 + x_2$$
$$\text{s.t. } x_1 + x_2 \leq 3$$
$$x_1 \leq 2$$
$$x_2 \leq 2$$
$$x_1, x_2 \geq 0$$

You have inserted three slack variables and have reached a certain basic table. This is all you know about the entries of that table:

·	·	·	0	2	0	·
·	·	·	1	−1	0	·
·	·	·	0	1	0	·
·	·	·	0	0	1	·

   (a) What is the M matrix?

   (b) Using the M matrix, fill in *only* the missing numbers in the table that will be needed to determine whether or not the current table is optimal.

   (c) Using the M matrix, now fill in *only* the missing numbers in the table that will be needed to determine where a pivot should be made.

   (d) Now do *only* the calculations necessary to determine the new basic feasible solution and its objective function value that will result from the pivot.

   (e) Now efficiently calculate what the *new* M matrix will be that results from the pivot.

4. Use what we know about the existence of the M matrix to answer problem 5.3-7 (a) and (b).

5. Solve parts (a)–(d) of Case Study 4.3 on pages 188–189, and parts (b)–(d) and (f)–(g) of Case Study 6.3 on pages 307–308. Please type your answers and include copies of your spreadsheets.