MATH 409 SAMPLE QUIZ **NAME (Please print):** _____

April 1, 2011

There are 2 problems. Stop now and make sure you have both problems. If you do not have them both, then request a new quiz. Both problems are worth 35 points for a total of 70 points. Show all of your work and follow the directions provided. Partial credit will be given for partial solutions. *CALCULATORS ARE NOT ALLOWED!*

CAUTION!!
If a problem provides very little space for the answer, then the answer requires only very little space, i.e. it is a short answer question. Long rambling answers to a short answer question indicates that you don't really know the correct answer. Such solutions will incur negative points for every irrelevant statement. Thus, even if somewhere in your answer you have the correct information, you can still get zero points because it is accompanied by a bunch of stuff unrelated to the question. I expect your answers to be as concise as possible.

Problem	Score
1	
2	
Total	

(1) Solve the following LP using the primal simplex algorithm in tableau form. State the optimal solution to both the primal and dual problem and give the associated optimal value.

$$\begin{array}{lrcrcrcl} \text{maximize} & 3x_1 & - & 3x_2 & + & 5x_3 & & \\ \text{subject to} & x_1 & - & x_2 & & & \leq & 5 \\ & 4x_1 & + & 5x_2 & - & 2x_3 & \leq & 7 \\ & x_1 & - & x_2 & + & x_3 & \leq & 1 \\ & 0 & \leq & x_1, & x_2, & x_3 & & \end{array}$$

(2) Solve the following LP using the dual simplex algorithm in tableau form. State the optimal solution to both the primal and dual problem and give the associated optimal value.

$$
\begin{array}{lrcrcrcrcr}
\text{maximize} & -2x_1 & - & x_2 & - & 2x_3 & - & 4x_4 & & \\
\text{subject to} & x_1 & - & 2x_2 & - & x_3 & + & x_4 & \leq & -3 \\
 & x_1 & + & x_2 & & & - & x_4 & \leq & -1 \\
 & -x_1 & + & x_2 & + & 2x_3 & & & \leq & 6 \\
 & 0 & \leq & x_1, & x_2, & x_3, & x_4 & & &
\end{array}
$$