Math 30210 — Introduction to Operations Research

Quiz 3 – Wednesday September 19, 2007

NAME: _____

Instructions: This is a closed-book quiz. Please do not use any notes.

Consider the following problem: Maximize $x_1 + 2x_2$ subject to $x_1, x_2 \geq 0$ and

$$\begin{aligned} x_1 + x_2 &\geq 1 \\ x_1 + x_2 &\leq 4 \\ -x_1 + x_2 &\leq 2. \end{aligned}$$

In standard form, we add variables $s_1, s_2, s_3 \geq 0$ and these constraints become

$$\begin{aligned} x_1 + x_2 - s_1 &= 1 \\ x_1 + x_2 + s_2 &= 4 \\ -x_1 + x_2 + s_3 &= 2. \end{aligned}$$

Two corner points of the feasible space are A ($x_1 = 1, x_2 = 0$) and B ($x_1 = 0, x_2 = 1$).

1. What are the basic variables at A?

2. What are the basic variables at B?

3. If the simplex algorithm moves from A to B, what is the entering basic variable?

4. And what is the departing basic variable?

5. How does the value of the objective function change in going from A to B?