Name _____

WSU ID# _____

Math 364 Quiz – Week #13

Consider the following tableau for a maximization SFLP.

$$\begin{aligned} x_3 &= \mathbf{a} + \mathbf{d}x_4 - x_5 \\ x_1 &= 2 + \mathbf{e}x_4 + x_5 \\ x_2 &= 1 + x_4 + 2x_5 \\ \hline z &= 7 + \mathbf{b}x_4 + \mathbf{c}x_5 \end{aligned}$$

Provide specific values for the parameters $\mathbf{a}, \mathbf{b}, \mathbf{c}, \mathbf{d}, \mathbf{e}$ in order to realize the following scenarios.

1. The current basic feasible solution is optimal.

   An optimal bfs must be feasible ($\mathbf{a} \geq 0$) and have only non-positive coefficients in the objective ($\mathbf{b}, \mathbf{c} \leq 0$). All other parameters can take on any finite value. [Any values which conform to these conditions are acceptable.]

2. The problem is unbounded.

   An unbounded problem must admit an infinite pivot step length. This is achieved when $\mathbf{a}, \mathbf{b}, \mathbf{d}, \mathbf{e} > 0$ and parameter $\mathbf{c}$ taking on any finite value.

3. The current basic solution is not feasible!

   A basic solution is not feasible when at least one basic variable value is negative. This is achieved when $\mathbf{a} < 0$ and other parameters can take on any finite value.