

CSE 521
Assignment 3
Due Tuesday, April 22, 2003

1. Solve the following problem using the Simplex Algorithm. Maximize $-x_1 + x_2 + 2x_3$ subject to

$$\begin{aligned}x_1 + 2x_2 - x_3 &\leq 20 \\ -2x_1 + 4x_2 + 2x_3 &\leq 60 \\ 2x_1 + 3x_2 + x_3 &\leq 50\end{aligned}$$

and $x_1, x_2, x_3 \geq 0$.

2. Consider the one-variable linear program P defined by,

$$\begin{aligned}\text{maximize} & \quad tx \\ \text{subject to} & \\ & \quad rx \leq s \\ & \quad x \geq 0\end{aligned}$$

where r , s , and t are real numbers. Let D be the dual of P . State for which values of r , s , and t it can be asserted that:

- (a) Both P and D have optimal solutions with finite objective values.
- (b) P is feasible, but D is not feasible.
- (c) D is feasible, but P is not feasible.
- (d) Neither P nor D is feasible.