

OR-1 Homework-5

Due : 2018/4/24 (Tue.), in class

1. Consider a polyhedron P defined by the following equations and inequalities.

$$2x_1 - x_2 + 5x_3 + x_4 + 3x_5 = 10$$

$$x_1 - x_2 + 5x_4 - 3x_5 = 30$$

$$x_j \geq 0, \text{ for } j = 1, \dots, 5$$

(a) Obtain a basic solution defined by $x_B = \{x_1, x_2\}$, $x_N = \{x_3, x_4, x_5\}$. Is the solution an extreme point of P ? Explain why or why not.

(b) Obtain a basic solution defined by $x_B = \{x_3, x_4\}$, $x_N = \{x_1, x_2, x_5\}$. Is the solution an extreme point of P ? Explain why or why not. Obtain a dictionary from which we can read the solution directly.

(c) Is the solution $x_1 = 0, x_2 = 5, x_3 = \frac{8}{5}, x_4 = 7, x_5 = 0$ an extreme point of P ?

Explain why or why not.

2 – 3. Solve the problems 2.1 a, b on text page 26 using the simplex method in both the dictionary and tableau format.

4. Text p.26, #2.2