Applied Finite Mathematics, 3rd edition

Chapter 4: Linear Programming by the Simplex Method Answers to Odd Numbered Homework Problems and Answers to all problems in the Chapter Review Section

4.1 No homework problems

4.2 Maximization by the Simplex Method

1). $x_1 = 0, x_2 = 9, x_3 = 3, z = 27$ 3). Wheat 80 acres, corn 20 acres; Profit $8400

5). 600 boxes; 400 of Box I, 200 of Box II, and none of Box III

4.3 Minimization by the Simplex Method

1) Dual program is Maximize $z = 7y_1 + 9y_2$
Subject to $2y_1+4y_2 \le 6$, $3y_1+5y_2 \le 8$, $y_1 \ge 0$, $y_2 \ge 0$
Answer to minimization problem is $x_1 = 0$, $x_2 = 7/3$, $z = 56/3$

3) Dual program is Maximize $z = 10y_1 + 24y_2$
Subject to $1y_1+3y_2 \le 4$, $1y_1+2y_2 \le 3$, $y_1 \ge 0$, $y_2 \ge 0$
Answer to minimization problem is $x_1 = 4$, $x_2 = 6$, $z = 34$

4.4 Review Problems

1). $x_1 = 4, x_2 = 8, y_1 = 0, y_2 = 0, z = 44$

2). $x_1 = 6, x_2 = 12, y_1 = 0, y_2 = 0, z = 126$

3). $x_1 = 6, x_2 = 4, x_3 = 0, y_1 = 0, y_2 = 0, z = 24$

4). $x_1 = 450, x_2 = 0, x_3 = 1800, y_1 = 750, y_2 = 0, y_3 = 0, z = 14{,}850$

5). $x_1 = 0, x_2 = 200, x_3 = 1600, y_1 = 0, y_2 = 0, y_3 = 1200, z = 9600$

6). $x_1 = 2, x_2 = 4, z = 64$

7). $x_1 = 10, x_2 = 10, x_3 = 0, z = 100$

8). $x_1 = 15/4, x_2 = 35/4, x_3 = 0, z = 570$

9) $x_1 = 0, x_2 = 80, x_3 = 100, y_1 = 0, y_2 = 20, y_3 = 0, z = 23000$

10). $x_1 = 0, x_2 = 30, x_3 = 60, y_1 = 0, y_2 = 0, z = 3300$

11). $x_1 = 60, x_2 = 20, z = 340{,}000$

12). $x_1 = 12, x_2 = 0, x_3 = 10, z = 42$