

第十三次作业答案

补充材料P109 3.

(1) 令 $x_4 = x_5 - x_6, x_5, x_6 \geq 0$; 不等式 $x_1 + x_2 - x_3 + 2x_4 \leq 14$ 左边加上 x_7 ; 不等式 $-2x_1 + 3x_2 + x_3 - x_4 \geq 2$ 左边减去 x_8 ; 令 $\max \hat{z} = -z$. 则标准形式为

$$\begin{aligned} \max z &= x_1 - 2x_2 + 3x_3 - 2x_5 + 2x_6, \\ \text{s.t.} \quad &\begin{cases} 4x_1 - x_2 + 2x_3 - x_5 + x_6 = -2, \\ x_1 + x_2 - x_3 + 2x_5 - 2x_6 + x_7 = 14, \\ -2x_1 + 3x_2 + x_3 - x_5 + x_6 - x_8 = 2, \\ x_1, x_2, x_3, x_5, x_6, x_7, x_8 \geq 0. \end{cases} \end{aligned}$$

(2) 用 $-x_1$ 代替 x_1 ; 令 $x_3 = x_4 - x_5, x_4, x_5 \geq 0$; 不等式 $-2x_1 + x_2 - x_3 \leq 6$ 左边加上 x_6 . 则标准形式为

$$\begin{aligned} \max z &= x_1 - 3x_2 + 2x_4 - 2x_5, \\ \text{s.t.} \quad &\begin{cases} x_1 + x_2 + x_4 - x_5 = 4, \\ 2x_1 + x_2 - x_4 + x_5 + x_6 = 6, \\ x_1, x_2, x_4, x_5, x_6 \geq 0. \end{cases} \end{aligned}$$

补充材料P109 4(2).

标准形式:

$$\begin{aligned} \max z &= -3x_1 - 2x_2 + 3x_3 - 6x_4, \\ \text{s.t.} \quad &\begin{cases} x_1 + 2x_2 + 3x_3 + 2x_4 = 7, \\ 2x_1 + 4x_2 + x_3 - 2x_4 = 3, \\ x_1, x_2, x_3, x_4 \geq 0. \end{cases} \end{aligned}$$

由图解法得基可行解为:

$$\left(\frac{2}{5}, 0, \frac{11}{5}, 0\right)^T, \left(\frac{10}{3}, 0, 0, \frac{11}{6}\right)^T, \left(0, \frac{1}{5}, \frac{11}{5}, 0\right)^T, \left(0, \frac{5}{3}, 0, \frac{11}{6}\right)^T.$$

代入计算得最优解为 $(0, \frac{1}{5}, \frac{11}{5}, 0)^T$.