Exercise 5.1

5.1 a

$$\max w = 35\pi_1 + 2\pi_2$$

$$\text{s.t} \quad 5\pi_1 - \pi_2 \leq 3$$

$$7\pi_1 + 2\pi_2 \leq -6$$

$$\pi_1, \pi_2 \leq 0$$

b

$$\max w = \pi_1 + 6\pi_2$$

$$\text{s.t.} \quad \pi_1 + 3\pi_2 \leq 2$$

$$\pi_1 + 2\pi_2 \leq 1$$

$$\pi_1 \geq 0, \pi_2 \leq 0$$

c

$$\max w = 6\pi_1 + 4\pi_2 - 20$$

$$\text{s.t} \quad -3\pi_1 - 8\pi_2 \leq -3$$

$$3\pi_1 + 4\pi_2 \leq 1$$

$$\pi_1, \pi_2 \leq 0$$

d

$$\min \quad 100\pi_1 + 100\pi_2 + 100\pi_3$$

$$\text{s.t} \quad 2\pi_1 + 6\pi_2 + 10\pi_3 \geq 240$$

$$2\pi_1 + \pi_2 \geq 60$$

$$\pi_1, \pi_2, \pi_3 \geq 0$$

e

$$\begin{aligned} \max \quad & W = 8\pi_1 - 2\pi_2 \\ \text{s.t} \quad & 2\pi_1 \leq -3 \\ & 3\pi_1 + \pi_2 = -4 \\ & \pi_1 \leq 0, \ \pi_2 \geq 0 \end{aligned}$$

f

$$\begin{aligned} \min \quad & 13\pi_1 + 20\pi_2 \\ \text{s.t.} \quad & 2\pi_1 - 5\pi_2 \leq -5 \\ & 9\pi_1 + 3\pi_2 \geq 7 \\ & \pi_1 \in \mathbb{R}, \ \pi_2 \geq 0 \end{aligned}$$