

Sensitivity Analysis Problems

1. (a) $B^{-1} = \begin{bmatrix} \frac{1}{3} & \frac{1}{3} \\ -\frac{1}{3} & \frac{2}{3} \end{bmatrix}$ (b) $-\frac{1}{3}$ (c) $-\frac{2}{3}$

(d) $\frac{1}{3}$ (e) 74

2. (a) $\pi = (4 \ 0 \ 10)$, $\lambda = (9 \ 0 \ 0 \ 2)$

(b) $\pi_1 = 4$, $\pi_2 = 0$, $\pi_3 = 10$. Resource 3 should be chosen.

(c) new $z_4 - c_4 = -2$; x_4 enters, x_2 leaves
 $x^* = (0, 0, 16, 20, 0, 18, 0)$, $z^* = 480$

(d) new $x_B = \begin{bmatrix} 20 \\ -2 \\ 36 \end{bmatrix}$; x_6 leaves, x_4 enters

$x^* = (0, 18, 32, 4, 0, 0, 0)$, $z^* = 512$

3. (a) x_2 enters, x_1 leaves; $x^* = (0, 12, 12, 0, 0)$, $z^* = 168$

(c) $16 \leq b_1 \leq 48$

(d) Yes, since $\pi_1 = \frac{15}{4} > 3$.

(e) $c_2 \leq \frac{33}{4}$

4. (a) $x^* = (9, 6, 0, 0)$, $z^* = 252$

(b) $-1 \leq t \leq 8$, $z^* = 252 + 36t$

5. $-9/2 \leq t \leq 2$, $z^* = 252 + 4t$