

Homework 9

Matt Forbes

November 30, 2010

6.4

$$a) \begin{bmatrix} 1 & 0 & 5 & 1 \\ 0 & 1 & -1 & -1 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 1 \end{bmatrix} = Q$$

b) \$5

c) New constant col = $\begin{bmatrix} 0 \\ 20 \\ 10 \\ 4 \end{bmatrix}$, and in the optimal tableau, it would be multiplied by Q .

$$Q \begin{bmatrix} 0 \\ 20 \\ 10 \\ 4 \end{bmatrix} = \begin{bmatrix} 54 \\ 6 \\ 6 \\ 4 \end{bmatrix} \Rightarrow \bar{x} = (4, 0, 0, 6)^T$$

$$d) Q \begin{bmatrix} 0 \\ 20 \\ 10 \\ 8 \end{bmatrix} = \begin{bmatrix} 58 \\ 2 \\ 2 \\ 8 \end{bmatrix} \Rightarrow \bar{x} = (6, 0, 0, 2)^T$$

$$e) \begin{array}{l} q \geq 0 \\ 7+q \geq 0 \\ 1+q \geq 0 \end{array} \Rightarrow \begin{array}{l} q \geq 0 \\ q \geq -7 \\ q \geq -1 \end{array} \Rightarrow \text{Any } q \text{ greater or equal to zero.}$$

f) The largest change of price of product 3 is 7 if trying to keep the same schedule. Any increase will change the schedule so 11 would be the very greatest price to keep the schedule

g) Set $c_4 = -1$ and pivot gives

$$\bar{x} = (0, 5, 0, 10)^T$$

6.7

a) No, it is not optimal anymore.
By changing the selling price, we
change the originally optimal tableau and
require pivots. These pivots changed the tableau
and the optimal solⁿ. $\text{Max} = 70$.

b) $-q + p - s \geq 0$

$$7 - r + p + s \geq 0$$

