Homework 4 - Problem 4

4)

$$M = \begin{bmatrix} 90.738 & 509.992 & 282.879 & -9.364 \\ -487.212 & 137.214 & 216.546 & 1.045 \\ -0.058 & 0.119 & 0.991 & 17.865 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$(KB)^{-1} = \begin{bmatrix} 90.738 & -487.212 & -0.058 \\ 509.992 & 137.214 & -0.119 \\ 282.879 & 216.546 & 0.991 \end{bmatrix}$$

$QR\ ((KB)^{-1})$

$K=0$

$$q_0 = \begin{bmatrix} 90.738 \\ 509.992 \\ 282.879 \end{bmatrix} \qquad H_0 = \begin{bmatrix} -0.154 & -0.864 & -0.479 \\ -0.864 & 0.353 & -0.359 \\ -0.479 & -0.359 & 0.801 \end{bmatrix}$$

$$Q_0 = \begin{bmatrix} -0.154 & -0.864 & -0.479 \\ -0.864 & 0.353 & -0.359 \\ -0.479 & -0.359 & 0.801 \end{bmatrix}$$

$$A_0 = \begin{bmatrix} -590.208 & -147.449 & -0.569 \\ 0 & 391.678 & -0.264 \\ 0 & 357.690 & 0.779 \end{bmatrix} \qquad \alpha = 1.157 \qquad \beta = 0.647$$

$K=1$

$$q_1 = \begin{bmatrix} -147.449 \\ 391.678 \\ 357.690 \end{bmatrix} \qquad H_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -0.738 & -0.674 \\ 0 & -0.674 & 0.738 \end{bmatrix} \qquad \alpha = 1.354 \qquad \beta = 0.314$$

$$Q_1 = \begin{bmatrix} 0.154 & 0.961 & 0.229 \\ -0.864 & -0.018 & -0.503 \\ -0.479 & -0.275 & 0.833 \end{bmatrix} \qquad A_1 = \begin{bmatrix} -590.208 & -147.449 & -0.569 \\ 0 & -530.428 & -0.330 \\ 0 & 0 & 0.753 \end{bmatrix}$$

$K=2$

$$q_2 = \begin{bmatrix} -0.569 \\ -0.330 \\ 0.753 \end{bmatrix} \qquad H_2 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix} \qquad Q_2 = \begin{bmatrix} -0.154 & 0.961 & -0.229 \\ -0.864 & -0.018 & 0.503 \\ -0.479 & -0.275 & -0.833 \end{bmatrix}$$

$$A_2 = \begin{bmatrix} -590.208 & -147.449 & -0.569 \\ 0 & -530.428 & -0.330 \\ 0 & 0 & -0.753 \end{bmatrix} \qquad \alpha = 1. \qquad \beta = 0.5$$

$QR\left((KR)^{-1} = R^{-1}K^{-1}\right)$

$$Q = R^{-1} = \begin{bmatrix} -0.154 & 0.961 & -0.229 \\ -0.864 & -0.018 & 0.503 \\ -0.479 & -0.275 & -0.833 \end{bmatrix}$$

$$R = K^{-1} = \begin{bmatrix} -590.208 & -147.449 & -0.569 \\ 0 & -530.428 & -0.530 \\ 0 & 0 & -0.753 \end{bmatrix}$$