

7.4

$$1.(a) \quad A^{-1} = \begin{bmatrix} 18 & -24 \\ -24 & 36 \end{bmatrix} \quad K(A) = \frac{5}{6} \times 60 = 50$$

$$(b) \quad B^{-1} = \begin{bmatrix} 6.7442 & -3.7209 \\ -15.8140 & 9.0698 \end{bmatrix} \quad K(B) = (6.8+2.9)(15.8140+9.0698) = 241.3729$$

$$(c) \quad C^{-1} = \begin{bmatrix} -1 & 1 \\ 0.5 & -0.5 \end{bmatrix} \times 10^5 \quad K(C) = 3.0000 \times 2 \times 10^5 = 600000$$

$$(d) \quad D^{-1} = \begin{bmatrix} 879.4753 & -158.7592 \\ -15.1681 & 2.7412 \end{bmatrix} \quad K(D) = (5.55+321.8)(879.4753+158.7592) = 339866$$

$$(e) \quad E^{-1} = \begin{bmatrix} 1 & 1 & -2 \\ 0 & 1 & -1 \\ 0 & 0 & -1 \end{bmatrix} \quad K(E) = 3 \times 4 = 12$$

$$(f) \quad F^{-1} = \begin{bmatrix} 27.5862 & -0.6897 & 0.0345 \\ -11.4943 & 1.9540 & 0.0690 \\ -1.1494 & -0.8046 & 0.2069 \end{bmatrix} \quad K(F) = (1+2+4)(27.5862+1.9540+0.0345) = 198.1728$$

$$9. \quad H = \begin{bmatrix} 1 & \frac{1}{2} & \frac{1}{3} \\ \frac{1}{2} & \frac{1}{3} & \frac{1}{4} \\ \frac{1}{3} & \frac{1}{4} & \frac{1}{5} \end{bmatrix} \quad H^{-1} = \begin{bmatrix} 8.968 & -35.77 & 29.77 \\ -35.77 & 190.6 & -178.6 \\ 29.77 & -178.6 & 178.6 \end{bmatrix}$$

$$\hat{H} = \begin{bmatrix} 0.9799 & 0.4870 & 0.3238 \\ 0.4860 & 0.3246 & 0.2434 \\ 0.3232 & 0.2433 & 0.1949 \end{bmatrix} \quad \|H - \hat{H}\|_{\infty} = 0.04260$$