

$$12. \|A\|_{\infty} = \max_{1 \leq i \leq n} \sum_{j=1}^n |a_{ij}| = 1.1$$

$$\|A\|_1 = \max_{1 \leq j \leq n} \sum_{i=1}^n |a_{ij}| = 0.8$$

$$\|A\|_F = \sqrt{\sum_{i=1}^n \sum_{j=1}^n (a_{ij})^2} = 0.842615$$

$$A^T A = \begin{pmatrix} 0.37 & 0.33 \\ 0.33 & 0.34 \end{pmatrix}$$

$$\lambda_{\max}(A^T A) = 0.6853407$$

$$\|A\|_2 = \sqrt{\lambda_{\max}(A^T A)} = 0.8278531$$

$$7. \rightarrow \begin{bmatrix} -18 & 3 & -1 & -15 \\ 12 & -3 & 3 & 15 \\ 1 & 1 & 1 & 6 \end{bmatrix}$$

$$\rightarrow \begin{bmatrix} -18 & 3 & -1 & -15 \\ 0 & -1 & \frac{7}{3} & 5 \\ 0 & \frac{7}{6} & \frac{17}{18} & \frac{31}{6} \end{bmatrix}$$

$$\rightarrow \begin{bmatrix} -18 & 3 & -1 & -15 \\ 0 & -1 & \frac{7}{3} & 5 \\ 0 & 0 & \frac{11}{3} & 11 \end{bmatrix}$$

$$X = [1, 2, 3]^T \quad \det A = -66$$