

用伴随矩阵求逆矩阵

练习

用伴随矩阵求下列矩阵的逆矩阵

a) $\begin{pmatrix} 10 & 53 \\ 3 & 16 \end{pmatrix}$

b) $\begin{pmatrix} 1 & -6 \\ 0 & 1 \end{pmatrix}$

c) $\begin{pmatrix} 0 & -2 & 3 \\ 1 & -1 & 2 \\ -5 & 5 & 4 \end{pmatrix}$

d) $\begin{pmatrix} -1 & 1 & -5 \\ -3 & 3 & -2 \\ 3 & -2 & 4 \end{pmatrix}$

e) $\begin{pmatrix} -4 & 2 & 0 \\ -2 & -5 & 2 \\ 2 & 0 & 5 \end{pmatrix}$

f) $\begin{pmatrix} -4 & -4 & 5 \\ -1 & -4 & 4 \\ -5 & 4 & -5 \end{pmatrix}$

$$g) \begin{pmatrix} -4 & -5 & 4 \\ -1 & 5 & -5 \\ 1 & 0 & -5 \end{pmatrix}$$

$$h) \begin{pmatrix} -5 & 3 & -4 \\ -3 & -1 & 4 \\ -1 & 0 & -2 \end{pmatrix}$$

$$i) \begin{pmatrix} -2 & 0 & 4 & -3 \\ 1 & -2 & 2 & -1 \\ -3 & 1 & -3 & 5 \\ -1 & -4 & -4 & -4 \end{pmatrix}$$

$$j) \begin{pmatrix} 0 & -4 & -3 & -3 \\ -5 & -5 & 2 & 5 \\ 3 & -3 & 4 & -4 \\ -4 & 5 & 3 & -5 \end{pmatrix}$$

$$k) \begin{pmatrix} -4 & 0 & 0 & 2 \\ 1 & 0 & -4 & 0 \\ -5 & -5 & 3 & -1 \\ -1 & 0 & -2 & -1 \end{pmatrix}$$

$$l) \begin{pmatrix} 4 & 0 & -1 & 2 \\ -2 & 1 & 1 & -3 \\ 4 & 0 & 1 & 0 \\ 5 & 0 & 5 & 0 \end{pmatrix}$$

答案

$$\text{a) } A^* = \begin{pmatrix} 16 & -53 \\ -3 & 10 \end{pmatrix}, A^{-1} = \begin{pmatrix} 16 & -53 \\ -3 & 10 \end{pmatrix}$$

$$\text{b) } A^* = \begin{pmatrix} 1 & 6 \\ 0 & 1 \end{pmatrix}, A^{-1} = \begin{pmatrix} 1 & 6 \\ 0 & 1 \end{pmatrix}$$

$$\text{c) } A^* = \begin{pmatrix} -14 & 23 & -1 \\ -14 & 15 & 3 \\ 0 & 10 & 2 \end{pmatrix}, A^{-1} = \begin{pmatrix} -\frac{1}{2} & \frac{23}{28} & -\frac{1}{28} \\ \frac{1}{15} & \frac{28}{15} & \frac{3}{28} \\ -\frac{2}{5} & \frac{28}{14} & \frac{28}{14} \end{pmatrix}$$

$$\text{d) } A^* = \begin{pmatrix} 8 & 6 & 13 \\ 6 & 11 & 13 \\ -3 & 1 & 0 \end{pmatrix}, A^{-1} = \begin{pmatrix} \frac{8}{13} & \frac{6}{13} & 1 \\ \frac{6}{11} & \frac{11}{13} & 1 \\ \frac{13}{3} & \frac{1}{13} & 0 \end{pmatrix}$$

$$\text{e) } A^* = \begin{pmatrix} -25 & -10 & 4 \\ 14 & -20 & 8 \\ 10 & 4 & 24 \end{pmatrix}, A^{-1} = \begin{pmatrix} -\frac{25}{128} & -\frac{5}{64} & \frac{1}{32} \\ \frac{7}{64} & -\frac{32}{5} & \frac{16}{3} \\ \frac{64}{5} & \frac{32}{16} & \frac{16}{3} \end{pmatrix}$$

$$\text{f) } A^* = \begin{pmatrix} 4 & 0 & 4 \\ -25 & 45 & 11 \\ -24 & 36 & 12 \end{pmatrix}, A^{-1} = \begin{pmatrix} -\frac{1}{9} & 0 & -\frac{1}{9} \\ \frac{25}{36} & -\frac{5}{4} & -\frac{11}{36} \\ \frac{2}{3} & -1 & -\frac{1}{3} \end{pmatrix}$$

$$\text{g) } A^* = \begin{pmatrix} -25 & -25 & 5 \\ -10 & 16 & -24 \\ -5 & -5 & -25 \end{pmatrix}, A^{-1} = \begin{pmatrix} -\frac{5}{26} & -\frac{5}{26} & \frac{1}{26} \\ \frac{1}{13} & \frac{65}{26} & -\frac{65}{26} \\ -\frac{1}{26} & -\frac{1}{26} & -\frac{1}{26} \end{pmatrix}$$

$$\text{h) } A^* = \begin{pmatrix} 2 & 6 & 8 \\ -10 & 6 & 32 \\ -1 & -3 & 14 \end{pmatrix}, A^{-1} = \begin{pmatrix} -\frac{1}{18} & -\frac{1}{6} & -\frac{2}{9} \\ \frac{18}{5} & -\frac{6}{7} & -\frac{9}{7} \\ \frac{1}{36} & \frac{1}{12} & -\frac{1}{18} \end{pmatrix}$$

$$\text{i) } A^* = \begin{pmatrix} -80 & 16 & -64 & -24 \\ 11 & -159 & -50 & -31 \\ 37 & 71 & 10 & -33 \\ -28 & 84 & 56 & -28 \end{pmatrix}, A^{-1} = \begin{pmatrix} -\frac{10}{49} & \frac{2}{159} & -\frac{8}{25} & -\frac{3}{31} \\ \frac{392}{37} & -\frac{392}{71} & -\frac{196}{5} & -\frac{392}{33} \\ \frac{392}{1} & \frac{392}{3} & \frac{196}{1} & -\frac{392}{1} \\ -\frac{14}{14} & \frac{14}{14} & \frac{7}{7} & -\frac{14}{14} \end{pmatrix}$$

$$\text{j) } A^* = \begin{pmatrix} -175 & -224 & 175 & -259 \\ -227 & -168 & -156 & 93 \\ -315 & 133 & 315 & 70 \\ -276 & 91 & -107 & -194 \end{pmatrix}, A^{-1} = \begin{pmatrix} -\frac{25}{383} & -\frac{32}{24} & \frac{25}{156} & -\frac{37}{93} \\ -\frac{2681}{45} & -\frac{383}{19} & -\frac{2681}{45} & \frac{2681}{10} \\ -\frac{383}{276} & \frac{383}{13} & \frac{383}{107} & \frac{383}{194} \\ -\frac{2681}{2681} & \frac{383}{383} & -\frac{2681}{2681} & -\frac{2681}{2681} \end{pmatrix}$$

$$\text{k) } A^* = \begin{pmatrix} 20 & -20 & 0 & 40 \\ -11 & 46 & 28 & -50 \\ 5 & 30 & 0 & 10 \\ -30 & -40 & 0 & 80 \end{pmatrix}, A^{-1} = \begin{pmatrix} -\frac{1}{7} & \frac{1}{7} & 0 & -\frac{2}{7} \\ \frac{11}{140} & -\frac{23}{70} & -\frac{1}{5} & \frac{5}{14} \\ -\frac{1}{28} & -\frac{14}{3} & 0 & -\frac{14}{4} \\ \frac{14}{14} & \frac{7}{7} & 0 & -\frac{7}{7} \end{pmatrix}$$

$$\text{l) } A^* = \begin{pmatrix} 0 & 0 & 10 & -2 \\ 45 & 30 & -45 & 12 \\ 0 & 0 & -10 & 8 \\ 15 & 0 & -25 & 8 \end{pmatrix}, A^{-1} = \begin{pmatrix} 0 & 0 & \frac{1}{3} & -\frac{1}{15} \\ \frac{3}{2} & 1 & -\frac{2}{5} & \frac{5}{4} \\ 0 & 0 & -\frac{3}{5} & \frac{15}{4} \\ \frac{1}{2} & 0 & -\frac{6}{6} & \frac{15}{15} \end{pmatrix}$$