

代幾 I 計算演習 [問題] (2008/07/03)

問. 次の平面への射影子行列を求めなさい

Q.1	Q.8	Q.15
$2x + 4y + z = 4$	$2x + y - 3z = -4$	$5x - 5y + z = -5$
Q.2	Q.9	Q.16
$x + 2y + z = 0$	$3x + 5y - 7z = -6$	$2x + 5y + z = -1$
Q.3	Q.10	Q.17
$3x + 2y = 6$	$5x - y + 2z = 6$	$4x - 5y - 5z = -6$
Q.4	Q.11	Q.18
$4y - 6z = 3$	$5x + y + 6z = -1$	$6x - 4z = 1$
Q.5	Q.12	Q.19
$5x - 4y - 7z = 2$	$7x - 5y = -3$	$3x - 2y - 7z = 1$
Q.6	Q.13	Q.20
$6x + 5y - 5z = 1$	$3x - 6y + 5z = 4$	$7x - 4y + 7z = 7$
Q.7	Q.14	Q.21
$3x - y - 4z = -3$	$x - 3y = -4$	$x + y - 4z = 7$

代幾 I 計算演習 [解答] (2008/07/03)

- A.1
$$\begin{pmatrix} \frac{17}{21} & -\frac{8}{21} & -\frac{2}{21} \\ -\frac{8}{21} & \frac{5}{21} & -\frac{4}{21} \\ -\frac{2}{21} & -\frac{4}{21} & \frac{20}{21} \end{pmatrix}$$
- A.2
$$\begin{pmatrix} \frac{5}{6} & -\frac{1}{3} & -\frac{1}{6} \\ -\frac{1}{3} & \frac{1}{3} & -\frac{1}{3} \\ -\frac{1}{6} & -\frac{1}{3} & \frac{5}{6} \end{pmatrix}$$
- A.3
$$\begin{pmatrix} \frac{4}{13} & -\frac{6}{13} & 0 \\ -\frac{6}{13} & \frac{9}{13} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$
- A.4
$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & \frac{9}{13} & \frac{6}{13} \\ 0 & \frac{6}{13} & \frac{4}{13} \end{pmatrix}$$
- A.5
$$\begin{pmatrix} \frac{13}{18} & \frac{2}{9} & \frac{7}{18} \\ \frac{2}{9} & \frac{37}{45} & -\frac{14}{45} \\ \frac{7}{18} & -\frac{14}{45} & \frac{41}{90} \end{pmatrix}$$
- A.6
$$\begin{pmatrix} \frac{25}{43} & -\frac{15}{43} & \frac{15}{43} \\ -\frac{15}{43} & \frac{61}{86} & \frac{25}{86} \\ \frac{15}{43} & \frac{25}{86} & \frac{61}{86} \end{pmatrix}$$
- A.7
$$\begin{pmatrix} \frac{17}{26} & \frac{3}{26} & \frac{6}{13} \\ \frac{3}{26} & \frac{25}{26} & -\frac{2}{13} \\ \frac{6}{13} & -\frac{2}{13} & \frac{5}{13} \end{pmatrix}$$
- A.8
$$\begin{pmatrix} \frac{5}{7} & -\frac{1}{7} & \frac{3}{7} \\ -\frac{1}{7} & \frac{13}{14} & \frac{3}{14} \\ \frac{3}{7} & \frac{3}{14} & \frac{5}{14} \end{pmatrix}$$
- A.9
$$\begin{pmatrix} \frac{74}{83} & -\frac{15}{83} & \frac{21}{83} \\ -\frac{15}{83} & \frac{58}{83} & \frac{35}{83} \\ \frac{21}{83} & \frac{35}{83} & \frac{34}{83} \end{pmatrix}$$
- A.10
$$\begin{pmatrix} \frac{1}{6} & \frac{1}{6} & -\frac{1}{3} \\ \frac{1}{6} & \frac{29}{30} & \frac{1}{15} \\ -\frac{1}{3} & \frac{1}{15} & \frac{13}{15} \end{pmatrix}$$
- A.11
$$\begin{pmatrix} \frac{37}{62} & -\frac{5}{62} & -\frac{15}{31} \\ -\frac{5}{62} & \frac{61}{62} & -\frac{3}{31} \\ -\frac{15}{31} & -\frac{3}{31} & \frac{13}{31} \end{pmatrix}$$
- A.12
$$\begin{pmatrix} \frac{25}{74} & \frac{35}{74} & 0 \\ \frac{35}{74} & \frac{49}{74} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$
- A.13
$$\begin{pmatrix} \frac{61}{70} & \frac{9}{35} & -\frac{3}{14} \\ \frac{9}{35} & \frac{17}{35} & \frac{3}{7} \\ -\frac{3}{14} & \frac{3}{7} & \frac{9}{14} \end{pmatrix}$$
- A.14
$$\begin{pmatrix} \frac{9}{10} & \frac{3}{10} & 0 \\ \frac{3}{10} & \frac{1}{10} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$
- A.15
$$\begin{pmatrix} \frac{26}{51} & \frac{25}{51} & -\frac{5}{51} \\ \frac{25}{51} & \frac{26}{51} & \frac{5}{51} \\ -\frac{5}{51} & \frac{5}{51} & \frac{50}{51} \end{pmatrix}$$
- A.16
$$\begin{pmatrix} \frac{13}{15} & -\frac{1}{3} & -\frac{1}{15} \\ -\frac{1}{3} & \frac{1}{6} & -\frac{1}{6} \\ -\frac{1}{15} & -\frac{1}{6} & \frac{29}{30} \end{pmatrix}$$
- A.17
$$\begin{pmatrix} \frac{25}{33} & \frac{10}{33} & \frac{10}{33} \\ \frac{10}{33} & \frac{41}{66} & -\frac{25}{66} \\ \frac{10}{33} & -\frac{25}{66} & \frac{41}{66} \end{pmatrix}$$
- A.18
$$\begin{pmatrix} \frac{4}{13} & 0 & \frac{6}{13} \\ 0 & 1 & 0 \\ \frac{6}{13} & 0 & \frac{9}{13} \end{pmatrix}$$
- A.19
$$\begin{pmatrix} \frac{53}{62} & \frac{3}{31} & \frac{21}{62} \\ \frac{3}{31} & \frac{29}{31} & -\frac{7}{31} \\ \frac{21}{62} & -\frac{7}{31} & \frac{13}{62} \end{pmatrix}$$
- A.20
$$\begin{pmatrix} \frac{65}{114} & \frac{14}{57} & -\frac{49}{114} \\ \frac{14}{57} & \frac{49}{57} & \frac{14}{57} \\ -\frac{49}{114} & \frac{14}{57} & \frac{65}{114} \end{pmatrix}$$
- A.21
$$\begin{pmatrix} \frac{17}{18} & -\frac{1}{18} & \frac{2}{9} \\ -\frac{1}{18} & \frac{17}{18} & \frac{2}{9} \\ \frac{2}{9} & \frac{2}{9} & \frac{1}{9} \end{pmatrix}$$