

代幾 I 計算演習 [問題] (2008/06/26)

問. 次の空間ベクトル v への射影子行列を求めなさい

Q.1

$$v = \begin{pmatrix} -5 \\ -6 \\ 3 \end{pmatrix}$$

Q.8

$$v = \begin{pmatrix} 1 \\ 2 \\ -2 \end{pmatrix}$$

Q.15

$$v = \begin{pmatrix} 7 \\ 3 \\ -1 \end{pmatrix}$$

Q.2

$$v = \begin{pmatrix} 4 \\ -6 \\ 2 \end{pmatrix}$$

Q.9

$$v = \begin{pmatrix} -4 \\ 3 \\ -6 \end{pmatrix}$$

Q.16

$$v = \begin{pmatrix} -5 \\ -5 \\ -4 \end{pmatrix}$$

Q.3

$$v = \begin{pmatrix} -4 \\ -3 \\ -4 \end{pmatrix}$$

Q.10

$$v = \begin{pmatrix} -5 \\ -5 \\ -3 \end{pmatrix}$$

Q.17

$$v = \begin{pmatrix} 2 \\ 0 \\ -5 \end{pmatrix}$$

Q.4

$$v = \begin{pmatrix} -2 \\ -4 \\ 3 \end{pmatrix}$$

Q.11

$$v = \begin{pmatrix} -2 \\ -3 \\ 0 \end{pmatrix}$$

Q.18

$$v = \begin{pmatrix} -3 \\ -3 \\ 3 \end{pmatrix}$$

Q.5

$$v = \begin{pmatrix} 4 \\ -4 \\ -1 \end{pmatrix}$$

Q.12

$$v = \begin{pmatrix} -6 \\ 7 \\ -2 \end{pmatrix}$$

Q.19

$$v = \begin{pmatrix} 4 \\ -5 \\ -4 \end{pmatrix}$$

Q.6

$$v = \begin{pmatrix} 5 \\ -3 \\ -5 \end{pmatrix}$$

Q.13

$$v = \begin{pmatrix} -3 \\ 6 \\ -3 \end{pmatrix}$$

Q.20

$$v = \begin{pmatrix} -3 \\ 5 \\ -5 \end{pmatrix}$$

Q.7

$$v = \begin{pmatrix} 2 \\ 2 \\ -4 \end{pmatrix}$$

Q.14

$$v = \begin{pmatrix} -2 \\ 4 \\ -3 \end{pmatrix}$$

Q.21

$$v = \begin{pmatrix} -1 \\ 3 \\ 5 \end{pmatrix}$$

代幾 I 計算演習 [解答] (2008/06/26)

- A.1
$$\begin{pmatrix} \frac{5}{14} & \frac{3}{7} & -\frac{3}{14} \\ \frac{3}{7} & \frac{18}{35} & -\frac{9}{35} \\ -\frac{3}{14} & -\frac{9}{35} & \frac{9}{70} \end{pmatrix}$$
- A.2
$$\begin{pmatrix} \frac{2}{7} & -\frac{3}{7} & \frac{1}{7} \\ -\frac{3}{7} & \frac{9}{14} & -\frac{3}{14} \\ \frac{1}{7} & -\frac{3}{14} & \frac{1}{14} \end{pmatrix}$$
- A.3
$$\begin{pmatrix} \frac{16}{41} & \frac{12}{41} & \frac{16}{41} \\ \frac{12}{41} & \frac{9}{41} & \frac{12}{41} \\ \frac{16}{41} & \frac{12}{41} & \frac{16}{41} \end{pmatrix}$$
- A.4
$$\begin{pmatrix} \frac{4}{29} & \frac{8}{29} & -\frac{6}{29} \\ \frac{8}{29} & \frac{16}{29} & -\frac{12}{29} \\ -\frac{6}{29} & -\frac{12}{29} & \frac{9}{29} \end{pmatrix}$$
- A.5
$$\begin{pmatrix} \frac{16}{33} & -\frac{16}{33} & -\frac{4}{33} \\ -\frac{16}{33} & \frac{16}{33} & \frac{4}{33} \\ -\frac{4}{33} & \frac{4}{33} & \frac{1}{33} \end{pmatrix}$$
- A.6
$$\begin{pmatrix} \frac{25}{59} & -\frac{15}{59} & -\frac{25}{59} \\ -\frac{15}{59} & \frac{9}{59} & \frac{15}{59} \\ -\frac{25}{59} & \frac{15}{59} & \frac{25}{59} \end{pmatrix}$$
- A.7
$$\begin{pmatrix} \frac{1}{6} & \frac{1}{6} & -\frac{1}{3} \\ \frac{1}{6} & \frac{1}{6} & -\frac{1}{3} \\ -\frac{1}{3} & -\frac{1}{3} & \frac{2}{3} \end{pmatrix}$$
- A.8
$$\begin{pmatrix} \frac{1}{9} & \frac{2}{9} & -\frac{2}{9} \\ \frac{2}{9} & \frac{4}{9} & -\frac{4}{9} \\ -\frac{2}{9} & -\frac{4}{9} & \frac{4}{9} \end{pmatrix}$$
- A.9
$$\begin{pmatrix} \frac{16}{61} & -\frac{12}{61} & \frac{24}{61} \\ -\frac{12}{61} & \frac{9}{61} & -\frac{18}{61} \\ \frac{24}{61} & -\frac{18}{61} & \frac{36}{61} \end{pmatrix}$$
- A.10
$$\begin{pmatrix} \frac{25}{59} & \frac{25}{59} & \frac{15}{59} \\ \frac{25}{59} & \frac{25}{59} & \frac{15}{59} \\ \frac{15}{59} & \frac{15}{59} & \frac{9}{59} \end{pmatrix}$$
- A.11
$$\begin{pmatrix} \frac{4}{13} & \frac{6}{13} & 0 \\ \frac{6}{13} & \frac{9}{13} & 0 \\ 0 & 0 & 0 \end{pmatrix}$$
- A.12
$$\begin{pmatrix} \frac{36}{89} & -\frac{42}{89} & \frac{12}{89} \\ -\frac{42}{89} & \frac{49}{89} & -\frac{14}{89} \\ \frac{12}{89} & -\frac{14}{89} & \frac{4}{89} \end{pmatrix}$$
- A.13
$$\begin{pmatrix} \frac{1}{6} & -\frac{1}{3} & \frac{1}{6} \\ -\frac{1}{3} & \frac{2}{3} & -\frac{1}{3} \\ \frac{1}{6} & -\frac{1}{3} & \frac{1}{6} \end{pmatrix}$$
- A.14
$$\begin{pmatrix} \frac{4}{29} & -\frac{8}{29} & \frac{6}{29} \\ -\frac{8}{29} & \frac{16}{29} & -\frac{12}{29} \\ \frac{6}{29} & -\frac{12}{29} & \frac{9}{29} \end{pmatrix}$$
- A.15
$$\begin{pmatrix} \frac{49}{59} & \frac{21}{59} & -\frac{7}{59} \\ \frac{21}{59} & \frac{9}{59} & -\frac{3}{59} \\ -\frac{7}{59} & -\frac{3}{59} & \frac{1}{59} \end{pmatrix}$$
- A.16
$$\begin{pmatrix} \frac{25}{66} & \frac{25}{66} & \frac{10}{33} \\ \frac{25}{66} & \frac{25}{66} & \frac{10}{33} \\ \frac{10}{33} & \frac{10}{33} & \frac{8}{33} \end{pmatrix}$$
- A.17
$$\begin{pmatrix} \frac{4}{29} & 0 & -\frac{10}{29} \\ 0 & 0 & 0 \\ -\frac{10}{29} & 0 & \frac{25}{29} \end{pmatrix}$$
- A.18
$$\begin{pmatrix} \frac{1}{3} & \frac{1}{3} & -\frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & -\frac{1}{3} \\ -\frac{1}{3} & -\frac{1}{3} & \frac{1}{3} \end{pmatrix}$$
- A.19
$$\begin{pmatrix} \frac{16}{57} & -\frac{20}{57} & -\frac{16}{57} \\ -\frac{20}{57} & \frac{25}{57} & \frac{20}{57} \\ -\frac{16}{57} & \frac{20}{57} & \frac{16}{57} \end{pmatrix}$$
- A.20
$$\begin{pmatrix} \frac{9}{59} & -\frac{15}{59} & \frac{15}{59} \\ -\frac{15}{59} & \frac{25}{59} & -\frac{25}{59} \\ \frac{15}{59} & -\frac{25}{59} & \frac{25}{59} \end{pmatrix}$$
- A.21
$$\begin{pmatrix} \frac{1}{35} & -\frac{3}{35} & -\frac{1}{7} \\ -\frac{3}{35} & \frac{9}{35} & \frac{3}{7} \\ -\frac{1}{7} & \frac{3}{7} & \frac{5}{7} \end{pmatrix}$$