代幾 I 計算演習 [問題] (2007/07/12)

問. 次の空間ベクトル v と垂直な平面への射影子行列を求めなさい

Q.1

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

Q.2

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

Q.3

$$\mathrm{v} = \begin{pmatrix} 1 \\ -6 \\ 3 \end{pmatrix}$$

Q.4

$$\mathrm{v} = \begin{pmatrix} -3 \\ 5 \\ -2 \end{pmatrix}$$

Q.5

$$\mathrm{v} = \begin{pmatrix} 6 \\ -4 \\ 0 \end{pmatrix}$$

Q.6

$$\mathrm{v} = \begin{pmatrix} -2 \\ -1 \\ -3 \end{pmatrix}$$

Q.7

$$\mathrm{v} = \begin{pmatrix} -1 \\ -5 \\ -4 \end{pmatrix}$$

Q.8

$$\mathrm{v} = \begin{pmatrix} 7 \\ -3 \\ 0 \end{pmatrix}$$

Q.9

$$\mathrm{v} = \begin{pmatrix} 0 \\ 6 \\ 4 \end{pmatrix}$$

Q.10

$$\mathrm{v} = \begin{pmatrix} 1 \\ -2 \\ 6 \end{pmatrix}$$

Q.11

$$\mathrm{v} = \begin{pmatrix} 3 \\ 1 \\ 0 \end{pmatrix}$$

Q.12

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

Q.13

$$\mathrm{v} = \begin{pmatrix} 2 \\ 0 \\ -6 \end{pmatrix}$$

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A.1

$$\begin{pmatrix} \frac{20}{29} & \frac{12}{29} & \frac{6}{29} \\ \frac{12}{29} & \frac{13}{29} & -\frac{8}{29} \\ \frac{6}{29} & -\frac{8}{29} & \frac{25}{29} \end{pmatrix}$$

A.2

$$\begin{pmatrix} \frac{10}{19} & \frac{9}{19} & \frac{3}{19} \\ \frac{9}{19} & \frac{10}{19} & -\frac{3}{19} \\ \frac{3}{19} & -\frac{3}{19} & \frac{18}{19} \end{pmatrix}$$

A.3

$$\begin{pmatrix} \frac{45}{46} & \frac{3}{23} & -\frac{3}{46} \\ \frac{3}{23} & \frac{5}{23} & \frac{9}{23} \\ -\frac{3}{46} & \frac{9}{23} & \frac{37}{46} \end{pmatrix}$$

A.4

$$\begin{pmatrix} \frac{29}{38} & \frac{15}{38} & -\frac{3}{19} \\ \frac{15}{38} & \frac{13}{38} & \frac{5}{19} \\ -\frac{3}{19} & \frac{5}{19} & \frac{17}{19} \end{pmatrix}$$

A.5

$$\begin{pmatrix} \frac{4}{13} & \frac{6}{13} & 0 \\ \frac{6}{13} & \frac{9}{13} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

A.6

$$\begin{pmatrix} \frac{5}{7} & -\frac{1}{7} & -\frac{3}{7} \\ -\frac{1}{7} & \frac{13}{14} & -\frac{3}{14} \\ -\frac{3}{7} & -\frac{3}{14} & \frac{5}{14} \end{pmatrix}$$

A.7

$$\begin{pmatrix} \frac{41}{42} & -\frac{5}{42} & -\frac{2}{21} \\ -\frac{5}{42} & \frac{17}{42} & -\frac{10}{21} \\ -\frac{2}{21} & -\frac{10}{21} & \frac{13}{21} \end{pmatrix}$$

A.8

$$\begin{pmatrix} \frac{9}{58} & \frac{21}{58} & 0 \\ \frac{21}{58} & \frac{49}{58} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

A.9

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & \frac{4}{13} & -\frac{6}{13} \\ 0 & -\frac{6}{13} & \frac{9}{13} \end{pmatrix}$$

A.10

$$\begin{pmatrix} \frac{40}{41} & \frac{2}{41} & -\frac{6}{41} \\ \frac{2}{41} & \frac{37}{41} & \frac{12}{41} \\ -\frac{6}{41} & \frac{12}{41} & \frac{5}{41} \end{pmatrix}$$

A.11

$$\begin{pmatrix} \frac{1}{10} & -\frac{3}{10} & 0 \\ -\frac{3}{10} & \frac{9}{10} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

A.12

$$\begin{pmatrix} \frac{52}{61} & \frac{18}{61} & -\frac{12}{61} \\ \frac{18}{61} & \frac{25}{61} & \frac{24}{61} \\ -\frac{12}{61} & \frac{24}{61} & \frac{45}{61} \end{pmatrix}$$

A.13

$$\begin{pmatrix} \frac{9}{10} & 0 & \frac{3}{10} \\ 0 & 1 & 0 \\ \frac{3}{10} & 0 & \frac{1}{10} \end{pmatrix}$$