

# 代数学幾何学 (A/B) 計算演習 [問題] (2009/05/21)

問. 次の平面ベクトル  $v$  への射影子行列を求めなさい

Q.1

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

Q.9

$$v = \begin{pmatrix} -7 \\ 8 \end{pmatrix}$$

Q.17

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

Q.2

$$v = \begin{pmatrix} -8 \\ 9 \end{pmatrix}$$

Q.10

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

Q.18

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

Q.3

$$v = \begin{pmatrix} 8 \\ 4 \end{pmatrix}$$

Q.11

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

Q.19

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

Q.4

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

Q.12

$$v = \begin{pmatrix} 9 \\ -1 \end{pmatrix}$$

Q.20

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

Q.5

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

Q.13

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

Q.21

$$v = \begin{pmatrix} -1 \\ 8 \end{pmatrix}$$

Q.6

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

Q.14

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

Q.22

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

Q.7

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

Q.15

$$v = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

Q.23

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

Q.8

$$v = \begin{pmatrix} -9 \\ -6 \end{pmatrix}$$

Q.16

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

Q.24

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

代数学幾何学 (A/B) 計算演習 [解答] (2009/05/21)

- |     |  |      |  |      |   |
|-----|--|------|--|------|---|
| A.1 | $\begin{pmatrix} \frac{4}{5} & \frac{2}{5} \\ \frac{2}{5} & \frac{1}{5} \end{pmatrix}$               | A.9  | $\begin{pmatrix} \frac{49}{113} & -\frac{56}{113} \\ -\frac{56}{113} & \frac{64}{113} \end{pmatrix}$ | A.17 | $\begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}$  |
| A.2 | $\begin{pmatrix} \frac{64}{145} & -\frac{72}{145} \\ -\frac{72}{145} & \frac{81}{145} \end{pmatrix}$ | A.10 | $\begin{pmatrix} \frac{9}{13} & -\frac{6}{13} \\ -\frac{6}{13} & \frac{4}{13} \end{pmatrix}$         | A.18 | $\begin{pmatrix} \frac{9}{25} & \frac{12}{25} \\ \frac{12}{25} & \frac{16}{25} \end{pmatrix}$ |
| A.3 | $\begin{pmatrix} \frac{4}{5} & \frac{2}{5} \\ \frac{2}{5} & \frac{1}{5} \end{pmatrix}$               | A.11 | $\begin{pmatrix} \frac{9}{10} & -\frac{3}{10} \\ -\frac{3}{10} & \frac{1}{10} \end{pmatrix}$         | A.19 | $\begin{pmatrix} \frac{25}{26} & -\frac{5}{26} \\ -\frac{5}{26} & \frac{1}{26} \end{pmatrix}$ |
| A.4 | $\begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}$   | A.12 | $\begin{pmatrix} \frac{81}{82} & -\frac{9}{82} \\ -\frac{9}{82} & \frac{1}{82} \end{pmatrix}$        | A.20 | $\begin{pmatrix} \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} \end{pmatrix}$        |
| A.5 | $\begin{pmatrix} \frac{1}{37} & \frac{6}{37} \\ \frac{6}{37} & \frac{36}{37} \end{pmatrix}$          | A.13 | $\begin{pmatrix} \frac{49}{50} & \frac{7}{50} \\ \frac{7}{50} & \frac{1}{50} \end{pmatrix}$          | A.21 | $\begin{pmatrix} \frac{1}{65} & -\frac{8}{65} \\ -\frac{8}{65} & \frac{64}{65} \end{pmatrix}$ |
| A.6 | $\begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix}$   | A.14 | $\begin{pmatrix} \frac{25}{29} & -\frac{10}{29} \\ -\frac{10}{29} & \frac{4}{29} \end{pmatrix}$      | A.22 | $\begin{pmatrix} \frac{1}{5} & -\frac{2}{5} \\ -\frac{2}{5} & \frac{4}{5} \end{pmatrix}$      |
| A.7 | $\begin{pmatrix} \frac{1}{26} & -\frac{5}{26} \\ -\frac{5}{26} & \frac{25}{26} \end{pmatrix}$        | A.15 | $\begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix}$   | A.23 | $\begin{pmatrix} \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} \end{pmatrix}$        |
| A.8 | $\begin{pmatrix} \frac{9}{13} & \frac{6}{13} \\ \frac{6}{13} & \frac{4}{13} \end{pmatrix}$           | A.16 | $\begin{pmatrix} \frac{16}{25} & \frac{12}{25} \\ \frac{12}{25} & \frac{9}{25} \end{pmatrix}$        | A.24 | $\begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}$  |