

# 代数学幾何学 (A/B) 計算演習 [問題] (2009/05/14)

問. 次の二つの空間ベクトル  $u, v$  の外積  $u \times v$  を求めなさい

Q.1

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

Q.7

$$u = \begin{pmatrix} 0 \\ -1 \\ -1 \end{pmatrix}, v = \begin{pmatrix} 3 \\ -2 \\ -1 \end{pmatrix}$$

Q.2

$$u = \begin{pmatrix} -3 \\ 2 \\ 3 \end{pmatrix}, v = \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$$

Q.8

$$u = \begin{pmatrix} 0 \\ -1 \\ 3 \end{pmatrix}, v = \begin{pmatrix} 3 \\ -3 \\ -3 \end{pmatrix}$$

Q.3

$$u = \begin{pmatrix} -3 \\ 1 \\ 3 \end{pmatrix}, v = \begin{pmatrix} 1 \\ 0 \\ -2 \end{pmatrix}$$

Q.9

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

Q.4

$$u = \begin{pmatrix} -2 \\ 2 \\ -2 \end{pmatrix}, v = \begin{pmatrix} 1 \\ -2 \\ 0 \end{pmatrix}$$

Q.10

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

Q.5

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

Q.11

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

Q.6

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

Q.12

$$u = \begin{pmatrix} 1 \\ -1 \\ 2 \end{pmatrix}, v = \begin{pmatrix} 0 \\ 1 \\ -2 \end{pmatrix}$$

代数学幾何学 (A/B) 計算演習 [解答] (2009/05/14)

A.1

$$\begin{pmatrix} 0 \\ -4 \\ 6 \end{pmatrix}$$

A.7

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

A.2

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

A.8

$$\begin{pmatrix} 12 \\ 9 \\ 3 \end{pmatrix}$$

A.3

$$\begin{pmatrix} -2 \\ -3 \\ -1 \end{pmatrix}$$

A.9

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

A.4

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

A.10

$$\begin{pmatrix} 0 \\ 15 \\ -5 \end{pmatrix}$$

A.5

$$\begin{pmatrix} -4 \\ -4 \\ 8 \end{pmatrix}$$

A.11

$$\begin{pmatrix} -8 \\ -2 \\ -9 \end{pmatrix}$$

A.6

$$\begin{pmatrix} 7 \\ 1 \\ 5 \end{pmatrix}$$

A.12

$$\begin{pmatrix} 0 \\ 2 \\ 1 \end{pmatrix}$$