

# 代数学幾何学 (A/B) 計算演習 [問題] (2009/06/04)

問. 次の二つの行列  $A, B$  の積  $AB$  を求めなさい

Q.1

$$A = \begin{pmatrix} -2 & 0 & -2 \\ 0 & 1 & -2 \\ 2 & 0 & 1 \end{pmatrix}, B = \begin{pmatrix} 1 & 1 & 0 & -1 \\ 2 & 1 & -2 & 0 \\ 2 & 2 & -2 & 0 \end{pmatrix}$$

Q.8

$$A = \begin{pmatrix} -2 & -2 & -1 & -2 \\ 2 & 2 & 2 & 1 \end{pmatrix}, B = \begin{pmatrix} -2 & -2 & -2 & 1 \\ 2 & 1 & 0 & 1 \\ -2 & 1 & -1 & 2 \\ -1 & 0 & 0 & 1 \end{pmatrix}$$

Q.2

$$A = \begin{pmatrix} -2 & -1 \\ 1 & 2 \\ 1 & -1 \\ 2 & -2 \end{pmatrix}, B = \begin{pmatrix} 2 & 0 & -2 & -1 \\ -2 & 1 & -1 & -1 \end{pmatrix}$$

Q.9

$$A = \begin{pmatrix} 0 & 0 \\ 2 & 0 \\ -2 & 1 \end{pmatrix}, B = \begin{pmatrix} 1 & -1 & 2 & 0 \\ -1 & -1 & 1 & -2 \end{pmatrix}$$

Q.3

$$A = \begin{pmatrix} -1 & -1 & 0 & 2 \end{pmatrix}, B = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 1 & -2 \\ 1 & 0 & 2 \\ 2 & -1 & 2 \end{pmatrix}$$

Q.10

$$A = \begin{pmatrix} -1 & -1 \\ -2 & 2 \\ 2 & -1 \end{pmatrix}, B = \begin{pmatrix} 2 & -2 & -2 & -1 \\ 0 & 1 & 1 & 0 \end{pmatrix}$$

Q.4

$$A = \begin{pmatrix} 1 & 1 & 2 \\ 1 & -1 & 0 \end{pmatrix}, B = \begin{pmatrix} -2 & -1 \\ -1 & -1 \\ -1 & 0 \end{pmatrix}$$

Q.11

$$A = \begin{pmatrix} 0 & 0 \\ 1 & 0 \\ 0 & -2 \end{pmatrix}, B = \begin{pmatrix} -1 & -1 & -1 \\ -2 & -1 & 2 \end{pmatrix}$$

Q.5

$$A = \begin{pmatrix} 2 & -1 \\ -2 & 0 \\ 2 & -2 \\ 1 & -1 \end{pmatrix}, B = \begin{pmatrix} 0 & -1 & 1 & 2 \\ 2 & 2 & -1 & -2 \end{pmatrix}$$

Q.12

$$A = \begin{pmatrix} 0 & 1 & 1 & 1 \end{pmatrix}, B = \begin{pmatrix} 2 \\ -1 \\ 0 \\ -2 \end{pmatrix}$$

Q.6

$$A = \begin{pmatrix} -1 & 0 & 0 & 0 \\ 2 & 2 & -1 & -1 \end{pmatrix}, B = \begin{pmatrix} -2 & 0 \\ 1 & 1 \\ 0 & 2 \\ -1 & -1 \end{pmatrix}$$

Q.13

$$A = \begin{pmatrix} -1 \\ -1 \\ -2 \\ 1 \end{pmatrix}, B = \begin{pmatrix} 1 & 2 & 2 & -2 \end{pmatrix}$$

Q.7

$$A = \begin{pmatrix} 2 & -1 \\ -2 & 2 \\ -2 & 0 \\ -2 & -2 \end{pmatrix}, B = \begin{pmatrix} 2 & -1 & 0 & -2 \\ 1 & 0 & -2 & 0 \end{pmatrix}$$

Q.14

$$A = \begin{pmatrix} 1 & -1 & 0 & -2 \\ 0 & -1 & 0 & 0 \end{pmatrix}, B = \begin{pmatrix} 2 & 2 \\ -2 & 2 \\ 0 & 2 \\ -1 & 2 \end{pmatrix}$$

代数学幾何学 (A/B) 計算演習 [解答] (2009/06/04)

A.1

$$AB = \begin{pmatrix} -6 & -6 & 4 & 2 \\ -2 & -3 & 2 & 0 \\ 4 & 4 & -2 & -2 \end{pmatrix}$$

A.2

$$AB = \begin{pmatrix} -2 & -1 & 5 & 3 \\ -2 & 2 & -4 & -3 \\ 4 & -1 & -1 & 0 \\ 8 & -2 & -2 & 0 \end{pmatrix}$$

A.3

$$AB = \begin{pmatrix} 4 & -4 & 6 \end{pmatrix}$$

A.4

$$AB = \begin{pmatrix} -5 & -2 \\ -1 & 0 \end{pmatrix}$$

A.5

$$AB = \begin{pmatrix} -2 & -4 & 3 & 6 \\ 0 & 2 & -2 & -4 \\ -4 & -6 & 4 & 8 \\ -2 & -3 & 2 & 4 \end{pmatrix}$$

A.6

$$AB = \begin{pmatrix} 2 & 0 \\ -1 & 1 \end{pmatrix}$$

A.7

$$AB = \begin{pmatrix} 3 & -2 & 2 & -4 \\ -2 & 2 & -4 & 4 \\ -4 & 2 & 0 & 4 \\ -6 & 2 & 4 & 4 \end{pmatrix}$$

A.8

$$AB = \begin{pmatrix} 4 & 1 & 5 & -8 \\ -5 & 0 & -6 & 9 \end{pmatrix}$$

A.9

$$AB = \begin{pmatrix} 0 & 0 & 0 & 0 \\ 2 & -2 & 4 & 0 \\ -3 & 1 & -3 & -2 \end{pmatrix}$$

A.10

$$AB = \begin{pmatrix} -2 & 1 & 1 & 1 \\ -4 & 6 & 6 & 2 \\ 4 & -5 & -5 & -2 \end{pmatrix}$$

A.11

$$AB = \begin{pmatrix} 0 & 0 & 0 \\ -1 & -1 & -1 \\ 4 & 2 & -4 \end{pmatrix}$$

A.12

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

A.13

$$AB = \begin{pmatrix} -1 & -2 & -2 & 2 \\ -1 & -2 & -2 & 2 \\ -2 & -4 & -4 & 4 \\ 1 & 2 & 2 & -2 \end{pmatrix}$$

A.14

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