

# 代数学幾何学 (A/B) 計算演習 [問題] (2009/05/14)

問. 次の行列の行列式を求めなさい

Q.1

$$\begin{vmatrix} 2 & 2 & 1 \\ 0 & -1 & 1 \\ 2 & 2 & -2 \end{vmatrix}$$

Q.7

$$\begin{vmatrix} -2 & 2 & 1 \\ 2 & -1 & 2 \\ -1 & 2 & 0 \end{vmatrix}$$

Q.13

$$\begin{vmatrix} 1 & -2 & 2 \\ 1 & 1 & 2 \\ 2 & 2 & 2 \end{vmatrix}$$

Q.2

$$\begin{vmatrix} -2 & 2 & -1 \\ 2 & 0 & 2 \\ 2 & 1 & 2 \end{vmatrix}$$

Q.8

$$\begin{vmatrix} 1 & 0 & 0 \\ 2 & 1 & -1 \\ 1 & 1 & 1 \end{vmatrix}$$

Q.14

$$\begin{vmatrix} -2 & 1 & -2 \\ 1 & 0 & -2 \\ 0 & 0 & 0 \end{vmatrix}$$

Q.3

$$\begin{vmatrix} 0 & 1 & 1 \\ 2 & 1 & -1 \\ 0 & 2 & -2 \end{vmatrix}$$

Q.9

$$\begin{vmatrix} -1 & -1 & -1 \\ 1 & -2 & 2 \\ 1 & 2 & 2 \end{vmatrix}$$

Q.15

$$\begin{vmatrix} 1 & 1 & 2 \\ 0 & 1 & -2 \\ 0 & 0 & 1 \end{vmatrix}$$

Q.4

$$\begin{vmatrix} 1 & -1 & 0 \\ 1 & 2 & -2 \\ 0 & 0 & -2 \end{vmatrix}$$

Q.10

$$\begin{vmatrix} 1 & 2 & 2 \\ 2 & -2 & -2 \\ 0 & 0 & 2 \end{vmatrix}$$

Q.16

$$\begin{vmatrix} 0 & 0 & 2 \\ 1 & -2 & 1 \\ 1 & 2 & -1 \end{vmatrix}$$

Q.5

$$\begin{vmatrix} -1 & 2 & 2 \\ 2 & 2 & -1 \\ -1 & 0 & 1 \end{vmatrix}$$

Q.11

$$\begin{vmatrix} 1 & 0 & -2 \\ -2 & 2 & 0 \\ -1 & 1 & -1 \end{vmatrix}$$

Q.17

$$\begin{vmatrix} 1 & 2 & -2 \\ 0 & -2 & 1 \\ 0 & 1 & 2 \end{vmatrix}$$

Q.6

$$\begin{vmatrix} -1 & -1 & 2 \\ -2 & -2 & -1 \\ -2 & 0 & 0 \end{vmatrix}$$

Q.12

$$\begin{vmatrix} 0 & 2 & -2 \\ 0 & 1 & 0 \\ 2 & 1 & 2 \end{vmatrix}$$

Q.18

$$\begin{vmatrix} -1 & -2 & -1 \\ 2 & -2 & 2 \\ 1 & 0 & 0 \end{vmatrix}$$

代数学幾何学 (A/B) 計算演習 [解答] (2009/05/14)

A.1

$$\begin{vmatrix} 2 & 2 & 1 \\ 0 & -1 & 1 \\ 2 & 2 & -2 \end{vmatrix} = 6$$

A.7

$$\begin{vmatrix} -2 & 2 & 1 \\ 2 & -1 & 2 \\ -1 & 2 & 0 \end{vmatrix} = 7$$

A.13

$$\begin{vmatrix} 1 & -2 & 2 \\ 1 & 1 & 2 \\ 2 & 2 & 2 \end{vmatrix} = -6$$

A.2

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

A.8

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

A.14

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

A.3

$$\begin{vmatrix} 0 & 1 & 1 \\ 2 & 1 & -1 \\ 0 & 2 & -2 \end{vmatrix} = 8$$

A.9

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

A.15

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

A.4

$$\begin{vmatrix} 1 & -1 & 0 \\ 1 & 2 & -2 \\ 0 & 0 & -2 \end{vmatrix} = -6$$

A.10

$$\begin{vmatrix} 1 & 2 & 2 \\ 2 & -2 & -2 \\ 0 & 0 & 2 \end{vmatrix} = -12$$

A.16

$$\begin{vmatrix} 0 & 0 & 2 \\ 1 & -2 & 1 \\ 1 & 2 & -1 \end{vmatrix} = 8$$

A.5

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

A.11

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

A.17

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

A.6

$$\begin{vmatrix} -1 & -1 & 2 \\ -2 & -2 & -1 \\ -2 & 0 & 0 \end{vmatrix} = -10$$

A.12

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

A.18

$$\begin{vmatrix} -1 & -2 & -1 \\ 2 & -2 & 2 \\ 1 & 0 & 0 \end{vmatrix} = -6$$