代数学幾何学 (A/B) 計算演習 [問題] (2009/10/22)

問. 次の行列の行列式を求めなさい

Q.1

$$\begin{vmatrix} 1 & -1 & -2 \\ -1 & 3 & 2 \\ 1 & 1 & 3 \end{vmatrix}$$

Q.2

$$\begin{vmatrix} -2 & -1 & 1 \\ -1 & 2 & 1 \\ 3 & -3 & 1 \end{vmatrix}$$

Q.3

$$\begin{vmatrix} 1 & -2 & 1 \\ 3 & 1 & -3 \\ -3 & 3 & 2 \end{vmatrix}$$

Q.4

$$\begin{vmatrix} -1 & -2 & -2 \\ -1 & 3 & -1 \\ 1 & -1 & 1 \end{vmatrix}$$

Q.5

$$\begin{vmatrix} 1 & 3 & -2 \\ 3 & 2 & -3 \\ 1 & 2 & 1 \end{vmatrix}$$

Q.6

$$\begin{vmatrix} 2 & -3 & 3 \\ -1 & 3 & -1 \\ 2 & -3 & 1 \end{vmatrix}$$

Q.7

$$\begin{vmatrix} 2 & 3 & 2 \\ -1 & 1 & 3 \\ 2 & -2 & -1 \end{vmatrix}$$

Q.8

$$\begin{vmatrix} -1 & -2 & -2 \\ -2 & 3 & -3 \\ -2 & 1 & -1 \end{vmatrix}$$

Q.9

$$\begin{vmatrix} -2 & 2 & -2 \\ 1 & -2 & 1 \\ -3 & 3 & -2 \end{vmatrix}$$

Q.10

$$\begin{vmatrix} -2 & 2 & 1 \\ 1 & 3 & -2 \\ 1 & 3 & 2 \end{vmatrix}$$

Q.11

$$\begin{vmatrix} 3 & -2 & 2 \\ 2 & -1 & 2 \\ -3 & -2 & -1 \end{vmatrix}$$

Q.12

$$\begin{vmatrix} 1 & 2 & -1 \\ 1 & -1 & -1 \\ 1 & -3 & 2 \end{vmatrix}$$

Q.13

$$\begin{vmatrix} 2 & 3 & -1 \\ 1 & 3 & -1 \\ 3 & -3 & -2 \end{vmatrix}$$

Q.14

$$\begin{vmatrix} -2 & 2 & -3 \\ 2 & -3 & 1 \\ 3 & 2 & -2 \end{vmatrix}$$

Q.15

$$\begin{vmatrix} -2 & 2 & -2 \\ 3 & 3 & 3 \\ 3 & 3 & -2 \end{vmatrix}$$

Q.16

$$\begin{vmatrix} 1 & -1 & -3 \\ 2 & -1 & -2 \\ 1 & 2 & -1 \end{vmatrix}$$

Q.17

$$\begin{vmatrix} 2 & -2 & -1 \\ 2 & -2 & 2 \\ -3 & -3 & -2 \end{vmatrix}$$

Q.18

$$\begin{vmatrix} -3 & 3 & 3 \\ -2 & -2 & 1 \\ -3 & 2 & 2 \end{vmatrix}$$

代数学幾何学 (A/B) 計算演習 [解答] (2009/10/22)

A.1

$$\text{与式} = \begin{vmatrix} 1 & -1 & -2 \\ -1 & 3 & 2 \\ 1 & 1 & 3 \end{vmatrix} = 10$$

A.2

$$\text{与式} = \begin{vmatrix} -2 & -1 & 1 \\ -1 & 2 & 1 \\ 3 & -3 & 1 \end{vmatrix} = (-17)$$

A.3

$$\text{与式} = \begin{vmatrix} 1 & -2 & 1 \\ 3 & 1 & -3 \\ -3 & 3 & 2 \end{vmatrix} = 17$$

A.4

$$\text{与式} = \begin{vmatrix} -1 & -2 & -2 \\ -1 & 3 & -1 \\ 1 & -1 & 1 \end{vmatrix} = 2$$

A.5

$$\text{与式} = \begin{vmatrix} 1 & 3 & -2 \\ 3 & 2 & -3 \\ 1 & 2 & 1 \end{vmatrix} = (-18)$$

A.6

$$\text{与式} = \begin{vmatrix} 2 & -3 & 3 \\ -1 & 3 & -1 \\ 2 & -3 & 1 \end{vmatrix} = (-6)$$

A.7

$$\text{与式} = \begin{vmatrix} 2 & 3 & 2 \\ -1 & 1 & 3 \\ 2 & -2 & -1 \end{vmatrix} = 25$$

A.8

$$\text{与式} = \begin{vmatrix} -1 & -2 & -2 \\ -2 & 3 & -3 \\ -2 & 1 & -1 \end{vmatrix} = (-16)$$

A.9

$$\text{与式} = \begin{vmatrix} -2 & 2 & -2 \\ 1 & -2 & 1 \\ -3 & 3 & -2 \end{vmatrix} = 2$$

A.10

$$\text{与式} = \begin{vmatrix} -2 & 2 & 1 \\ 1 & 3 & -2 \\ 1 & 3 & 2 \end{vmatrix} = (-32)$$

A.11

$$\text{与式} = \begin{vmatrix} 3 & -2 & 2 \\ 2 & -1 & 2 \\ -3 & -2 & -1 \end{vmatrix} = 9$$

A.12

$$\text{与式} = \begin{vmatrix} 1 & 2 & -1 \\ 1 & -1 & -1 \\ 1 & -3 & 2 \end{vmatrix} = (-9)$$

A.13

$$\text{与式} = \begin{vmatrix} 2 & 3 & -1 \\ 1 & 3 & -1 \\ 3 & -3 & -2 \end{vmatrix} = (-9)$$

A.14

$$\text{与式} = \begin{vmatrix} -2 & 2 & -3 \\ 2 & -3 & 1 \\ 3 & 2 & -2 \end{vmatrix} = (-33)$$

A.15

$$\text{与式} = \begin{vmatrix} -2 & 2 & -2 \\ 3 & 3 & 3 \\ 3 & 3 & -2 \end{vmatrix} = 60$$

A.16

$$\text{与式} = \begin{vmatrix} 1 & -1 & -3 \\ 2 & -1 & -2 \\ 1 & 2 & -1 \end{vmatrix} = (-10)$$

A.17

$$\text{与式} = \begin{vmatrix} 2 & -2 & -1 \\ 2 & -2 & 2 \\ -3 & -3 & -2 \end{vmatrix} = 36$$

A.18

$$\text{与式} = \begin{vmatrix} -3 & 3 & 3 \\ -2 & -2 & 1 \\ -3 & 2 & 2 \end{vmatrix} = (-9)$$