代幾 I 計算演習 [問題] (2006/11/30)

問. 次の行列の行列式を求めなさい

Q.1

$$\begin{vmatrix} 7 & 6 & 4 & 0 \\ 4 & -1 & 0 & 0 \\ 0 & 4 & 0 & 0 \\ -6 & 3 & -7 & 3 \end{vmatrix}$$

Q.2

$$\begin{vmatrix} -6 & -7 & -8 & 1 \\ 4 & 0 & 0 & 0 \\ -1 & 4 & -6 & 0 \\ 1 & 0 & 1 & 0 \end{vmatrix}$$

Q.3

$$\begin{vmatrix} 2 & 0 & 0 & 0 & 0 & 0 \\ -5 & 0 & 0 & 1 & 0 & 0 \\ -3 & 1 & -3 & 8 & 3 & 1 \\ -6 & 0 & -9 & 7 & 3 & 0 \\ -9 & 0 & 2 & 6 & 0 & 0 \\ -8 & 0 & -2 & -6 & -6 & 4 \end{vmatrix}$$

Q.4

$$\begin{vmatrix} 0 & 0 & 0 & 4 & 0 & 0 \\ -3 & 5 & 6 & 1 & 5 & 2 \\ 2 & 0 & 0 & 3 & 9 & 0 \\ 0 & 0 & 0 & 0 & 2 & 0 \\ -2 & 8 & 3 & 9 & -7 & 0 \\ 7 & 1 & 0 & 7 & -4 & 0 \end{vmatrix}$$

Q.5

$$\begin{vmatrix} 3 & 0 & -5 & 0 & 3 & 0 \\ -1 & 3 & -6 & 0 & 4 & 0 \\ 0 & 0 & 4 & 0 & -4 & 0 \\ 0 & 0 & 0 & 0 & 3 & 0 \\ 3 & 9 & 7 & 0 & 4 & 2 \\ 5 & -9 & -6 & 4 & 6 & 8 \end{vmatrix}$$

Q.6

$$\begin{vmatrix} 0 & 6 & 0 & 0 & 8 & 3 \\ -3 & 1 & -9 & 2 & 4 & 5 \\ 0 & 0 & 0 & 0 & 3 & 0 \\ 0 & 4 & 0 & 0 & -5 & 0 \\ 0 & 8 & 3 & 0 & -2 & 4 \\ 4 & -8 & 1 & 0 & 6 & -4 \end{vmatrix}$$

Q.7

$$\begin{vmatrix} 4 & 8 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 9 & 2 & 1 & 0 \\ -7 & -6 & 2 & 1 \end{vmatrix}$$

Q.8

$$\begin{vmatrix} 6 & -7 & 0 & 3 & 0 & -6 \\ -2 & 0 & 0 & 0 & 4 & 0 \\ 4 & 0 & 0 & 0 & 0 & 0 \\ 8 & -5 & 2 & 4 & 9 & -1 \\ -7 & 1 & 0 & 0 & 5 & 0 \\ 6 & -9 & 0 & 0 & 1 & 3 \end{vmatrix}$$

Q.9

$$\begin{vmatrix} 6 & -5 & 3 & 8 & -3 \\ 1 & 6 & 0 & 0 & 3 \\ 0 & 2 & 0 & 0 & 0 \\ 4 & -7 & 0 & 0 & 0 \\ 0 & 6 & 0 & 1 & -7 \end{vmatrix}$$

Q.10

$$\begin{vmatrix} 0 & 0 & 0 & 3 & 7 & 0 \\ 0 & 0 & 0 & 0 & 4 & 0 \\ -7 & 1 & -5 & -9 & 2 & 0 \\ 3 & 0 & 8 & 0 & -4 & 0 \\ 0 & 0 & 4 & 1 & 4 & 0 \\ -1 & -9 & -9 & -2 & -8 & 1 \end{vmatrix}$$

代幾 I 計算演習 [解答] (2006/11/30)

A.1

$$\begin{vmatrix} 7 & 6 & 4 & 0 \\ 4 & -1 & 0 & 0 \\ 0 & 4 & 0 & 0 \\ -6 & 3 & -7 & 3 \end{vmatrix} = 192$$

A.2

$$\begin{vmatrix} -6 & -7 & -8 & 1 \\ 4 & 0 & 0 & 0 \\ -1 & 4 & -6 & 0 \\ 1 & 0 & 1 & 0 \end{vmatrix} = -16$$

A.3

$$\begin{vmatrix} 2 & 0 & 0 & 0 & 0 & 0 \\ -5 & 0 & 0 & 1 & 0 & 0 \\ -3 & 1 & -3 & 8 & 3 & 1 \\ -6 & 0 & -9 & 7 & 3 & 0 \\ -9 & 0 & 2 & 6 & 0 & 0 \\ -8 & 0 & -2 & -6 & -6 & 4 \end{vmatrix} = -48$$

A.4

$$\begin{vmatrix} 0 & 0 & 0 & 4 & 0 & 0 \\ -3 & 5 & 6 & 1 & 5 & 2 \\ 2 & 0 & 0 & 3 & 9 & 0 \\ 0 & 0 & 0 & 0 & 2 & 0 \\ -2 & 8 & 3 & 9 & -7 & 0 \\ 7 & 1 & 0 & 7 & -4 & 0 \end{vmatrix} = 96$$

A.5

$$\begin{vmatrix} 3 & 0 & -5 & 0 & 3 & 0 \\ -1 & 3 & -6 & 0 & 4 & 0 \\ 0 & 0 & 4 & 0 & -4 & 0 \\ 0 & 0 & 0 & 0 & 3 & 0 \\ 3 & 9 & 7 & 0 & 4 & 2 \\ 5 & -9 & -6 & 4 & 6 & 8 \end{vmatrix} = 864$$

A.6

$$\begin{vmatrix} 0 & 6 & 0 & 0 & 8 & 3 \\ -3 & 1 & -9 & 2 & 4 & 5 \\ 0 & 0 & 0 & 0 & 3 & 0 \\ 0 & 4 & 0 & 0 & -5 & 0 \\ 0 & 8 & 3 & 0 & -2 & 4 \\ 4 & -8 & 1 & 0 & 6 & -4 \end{vmatrix} = -864$$

A.7

$$\begin{vmatrix} 4 & 8 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 9 & 2 & 1 & 0 \\ -7 & -6 & 2 & 1 \end{vmatrix} = 4$$

A.8

$$\begin{vmatrix} 6 & -7 & 0 & 3 & 0 & -6 \\ -2 & 0 & 0 & 0 & 4 & 0 \\ 4 & 0 & 0 & 0 & 0 & 0 \\ 8 & -5 & 2 & 4 & 9 & -1 \\ -7 & 1 & 0 & 0 & 5 & 0 \\ 6 & -9 & 0 & 0 & 1 & 3 \end{vmatrix} = -288$$

A.9

$$\begin{vmatrix} 6 & -5 & 3 & 8 & -3 \\ 1 & 6 & 0 & 0 & 3 \\ 0 & 2 & 0 & 0 & 0 \\ 4 & -7 & 0 & 0 & 0 \\ 0 & 6 & 0 & 1 & -7 \end{vmatrix} = 72$$

A.10

$$\begin{vmatrix} 0 & 0 & 0 & 3 & 7 & 0 \\ 0 & 0 & 0 & 0 & 4 & 0 \\ -7 & 1 & -5 & -9 & 2 & 0 \\ 3 & 0 & 8 & 0 & -4 & 0 \\ 0 & 0 & 4 & 1 & 4 & 0 \\ -1 & -9 & -9 & -2 & -8 & 1 \end{vmatrix} = -144$$