

数学C 2018 レポート7回目

①

問. 次の行列式を計算せよ.

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

$$\begin{vmatrix} 2 & 1 & -1 & -1 \\ -2 & -3 & 1 & 2 \\ -2 & -1 & 3 & 1 \\ -1 & -4 & 1 & 2 \end{vmatrix} = \boxed{(2)}$$

(1) = -1

(2) = 2

$$\begin{vmatrix} 1 & 0 & 2 \\ -1 & -1 & 1 \\ 2 & 1 & 2 \end{vmatrix} = (-1)^{2+2} (-1) \begin{vmatrix} 1 & 2 \\ 2 & 2 \end{vmatrix} + (-1)^{3+2} \cdot 1 \begin{vmatrix} 1 & 2 \\ -1 & 1 \end{vmatrix}$$

= -(2-4) - (1+2)

= -1

$$\begin{vmatrix} 2 & 1 & -1 & -1 \\ -2 & -3 & -1 & 2 \\ -2 & -1 & 3 & 1 \\ -1 & -4 & 1 & 2 \end{vmatrix}$$

(1行)+2(4行)
 (2行)-2(4行)
 (3行)-2(4行)

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

= (-1)^{4+1} (-1)

$$\begin{vmatrix} -7 & 1 & 3 \\ 5 & -1 & -2 \\ 7 & 1 & -3 \end{vmatrix}$$

(2行)+(1行)
 (3行)-(1行)

$$\begin{vmatrix} -7 & 1 & 3 \\ -2 & 0 & -1 \\ 14 & 0 & -6 \end{vmatrix}$$

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$$= (-1)^{1+2} \times 1 \times \begin{vmatrix} -2 & 1 \\ 14 & -6 \end{vmatrix}$$

$$= (-1)(12 - 14) = 2$$