

数学C 2017 レポート7回目

①

問. 次の行列式を計算せよ.

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

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

$$\boxed{(1)} = -1$$

$$\boxed{(2)} = 2$$

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

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

$$= -1$$

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

$$\begin{matrix} (1\text{行})+2(4\text{行}) \\ (2\text{行})-2(4\text{行}) \\ (3\text{行})-2(4\text{行}) \end{matrix} \begin{vmatrix} 0 & -7 & 1 & 3 \\ 0 & 5 & -1 & -2 \\ 0 & 7 & 1 & -3 \\ -1 & -4 & 1 & 2 \end{vmatrix}$$

$$= (-1)^{4+1} (-1) \begin{vmatrix} -7 & 1 & 3 \\ 5 & -1 & -2 \\ 7 & 1 & -3 \end{vmatrix}$$

$$\begin{matrix} (2\text{行})+(1\text{行}) \\ (3\text{行})-(1\text{行}) \end{matrix} \begin{vmatrix} -7 & 1 & 3 \\ -2 & 0 & -1 \\ 14 & 0 & -6 \end{vmatrix}$$

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

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