



線形代数及び演習II 宿題7-11次 No.3 解答 No. (10.09)

1

$$\det(A) = \begin{vmatrix} 2 & -1 & 1 & 3 \\ -3 & 0 & -2 & 3 \\ 2 & -2 & 2 & 3 \\ 2 & 3 & 3 & 2 \end{vmatrix} = \begin{vmatrix} 2 & -1 & 1 & 3 \\ -3 & 0 & -2 & 3 \\ 0 & -1 & 1 & 0 \\ 0 & 4 & 2 & -1 \end{vmatrix} = 2 \begin{vmatrix} 0 & -2 & 3 \\ -1 & 1 & 0 \\ 4 & 2 & -1 \end{vmatrix} + 3 \begin{vmatrix} -1 & -1 & 3 \\ -1 & -1 & 0 \\ 4 & 2 & -1 \end{vmatrix}$$

$$= 2 \begin{vmatrix} 0 & -2 & 3 \\ -1 & 1 & 0 \\ 0 & 6 & -1 \end{vmatrix} + 3 \begin{vmatrix} -1 & 1 & 3 \\ 0 & 0 & -3 \\ 0 & 6 & 11 \end{vmatrix} = 2 \begin{vmatrix} -2 & 3 \\ 6 & -1 \end{vmatrix} - 3 \begin{vmatrix} 0 & -3 \\ 6 & 11 \end{vmatrix} = 2(2-18) - 3 \times 18$$

$$= -32 - 54 = -86$$

$$\det(B) = \begin{vmatrix} 2 & 0 & -2 & -1 \\ 0 & 3 & 2 & 0 \\ 1 & 1 & -1 & -1 \\ -1 & 2 & 4 & 1 \end{vmatrix} = \begin{vmatrix} 0 & 4 & 6 & 7 \\ 0 & 3 & 2 & 0 \\ 0 & 3 & 3 & 0 \\ -1 & 2 & 4 & 1 \end{vmatrix} = -(-1) \begin{vmatrix} 4 & 6 & 7 \\ 3 & 2 & 0 \\ 3 & 3 & 0 \end{vmatrix}$$

$$= \begin{vmatrix} 3 & 2 \\ 3 & 3 \end{vmatrix} = 9 - 6 = 3$$

$$\det(AB) = \det(A) \det(B) = -86 \times 3 = -258$$