

数CLホト2019 (4回目)

問1. $A = \begin{pmatrix} 1 & -2 \\ -2 & 3 \end{pmatrix}$

逆行列 A^{-1} は、

$$A^{-1} = \begin{pmatrix} a & b \\ c & d \end{pmatrix}.$$

$$\boxed{(1)} = a + b + c + d$$

問2. $A = \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix}$ $B = \begin{pmatrix} 2 & -1 \\ -1 & 0 \end{pmatrix}$

$$\exists A^{-1} B^{-1} = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$$

$$\boxed{(2)} = a + b + c + d$$

問1.

$$A = \begin{pmatrix} 1 & -2 \\ -2 & 3 \end{pmatrix}$$

$$\Delta(A) = 3 - 4 = -1 \neq 0$$

逆行列 A^{-1} が存在して、

$$A^{-1} = \frac{1}{(-1)} \begin{pmatrix} 3 & 2 \\ 2 & 1 \end{pmatrix} = \begin{pmatrix} -3 & -2 \\ -2 & -1 \end{pmatrix}$$

$$-3 - 2 - 2 - 1 = -8 = \boxed{(1)}$$

問2.

$$BA = \begin{pmatrix} 2 & -1 \\ -1 & 0 \end{pmatrix} \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix}$$

$$= \begin{pmatrix} 5 & -4 \\ -2 & 1 \end{pmatrix} \quad \Delta(BA) = 5 - 8 = -3$$

$$3A^{-1}B^{-1} = 3(BA)^{-1}$$

$$= 3 \times \frac{1}{\Delta(BA)} \begin{pmatrix} 1 & 4 \\ 2 & 5 \end{pmatrix}$$

$$= (-1) \begin{pmatrix} 1 & 4 \\ 2 & 5 \end{pmatrix} = \begin{pmatrix} -1 & -4 \\ -2 & -5 \end{pmatrix}$$

$$-1 - 4 - 2 - 5 = -12 = \boxed{(2)}$$