

問

次の行列 A の逆行列を求めよ。

$$A = \begin{bmatrix} 3 & 3 & -5 & -6 \\ 1 & 2 & -3 & -1 \\ 2 & 3 & -5 & -3 \\ -1 & 0 & 2 & 2 \end{bmatrix} .$$

$$A^{-1} = \begin{bmatrix} 4 & \boxed{(1)} & \boxed{(2)} & -3 \\ 0 & -1 & 1 & -1 \\ 1 & 3 & -3 & 0 \\ 1 & 6 & -5 & -1 \end{bmatrix}$$

$$\boxed{(1)} = 18$$

$$\boxed{(2)} = -16$$

(2)

3	3	-5	-6	1			
1	2	-3	-1		1		
2	3	-5	-3			1	
-1	0	2	2				1

\downarrow
 $\begin{matrix} \textcircled{1} + 3 \times \textcircled{4} \\ \textcircled{2} + \textcircled{4}, \textcircled{3} + 2 \times \textcircled{4} \end{matrix}$

0	3	1	0	1	0	0	3
0	2	-1	1	0	1	0	1
0	3	-1	1	0	0	1	2
-1	0	2	2	0	0	0	1

\downarrow
 $\begin{matrix} \textcircled{1} - \textcircled{3} \\ \textcircled{2} - \textcircled{3} \end{matrix}$

0	0	2	-1	1	0	-1	1
0	-1	0	0	0	1	-1	-1
0	3	-1	1	0	0	1	2
-1	0	2	2	0	0	0	1

\downarrow
 $\textcircled{3} + 3 \times \textcircled{2}$

0	0	2	-1	1	0	-1	1
0	-1	0	0	0	1	-1	-1
0	0	-1	1	0	3	-2	-1
-1	0	2	2	0	0	0	1

$\begin{matrix} \textcircled{1} + \textcircled{3} \\ (-1) \times \textcircled{2} \end{matrix}$

1	0	0	0	4	18	-16	-3
0	1	0	0	0	-1	1	1
0	0	1	0	1	3	-3	0
0	0	0	1	1	6	-5	-1

\uparrow

0	0	1	0	1	3	-3	0
0	1	0	0	0	-1	1	1
0	0	0	1	1	6	-5	-1
1	0	0	0	4	18	-16	-3

$\uparrow \textcircled{4} + 2 \times \textcircled{1} + 2 \times \textcircled{3}$

0	0	1	0	1	3	-3	0
0	1	0	0	0	-1	1	1
0	0	0	1	1	6	-5	-1
1	0	-2	-2	0	0	0	-1

\uparrow
 $\begin{matrix} \textcircled{3} + \textcircled{1} \\ (-1) \times \textcircled{4} \end{matrix}$

0	0	1	0	1	3	-3	0
0	1	0	0	0	-1	1	1
0	0	-1	1	0	3	-2	-1
-1	0	2	2	0	0	0	1

\uparrow