학과 : 게임학부
학번 : C077044
이름 : 황태훈

17.
$$\left(\begin{array}{ccc|ccc} \frac{1}{3} & -\frac{2}{3} & \frac{2}{3} & 1 & 0 & 0 \\ \frac{1}{3} & -\frac{1}{6} & -\frac{5}{6} & 0 & 1 & 0 \\ \frac{2}{3} & -\frac{4}{3} & \frac{1}{6} & 0 & 0 & 1 \end{array}\right) \xrightarrow[6R_3]{3R_1,\ 6R_2} \left(\begin{array}{ccc|ccc} 1 & -2 & 2 & 3 & 0 & 0 \\ 2 & -1 & -5 & 0 & 6 & 0 \\ 4 & -8 & 1 & 0 & 0 & 6 \end{array}\right)$$

$-2R_1+R_2 \to R_2$, $-4R_1+R_3 \to R_3$

$$\left(\begin{array}{ccc|ccc} 1 & -2 & 2 & 3 & 0 & 0 \\ 0 & 3 & -9 & -6 & 6 & 0 \\ 0 & 0 & -7 & -12 & 0 & 6 \end{array}\right) \xrightarrow[-\frac{1}{7}R_3]{\frac{1}{3}R_2} \left(\begin{array}{ccc|ccc} 1 & -2 & 2 & 3 & 0 & 0 \\ 0 & 1 & -3 & -2 & 2 & 0 \\ 0 & 0 & 1 & \frac{12}{7} & 0 & -\frac{6}{7} \end{array}\right)$$

$2R_2+R_1 \to R_1$

$$\left(\begin{array}{ccc|ccc} 1 & 0 & -4 & -1 & 4 & 0 \\ 0 & 1 & -3 & -2 & 2 & 0 \\ 0 & 0 & 1 & \frac{12}{7} & 0 & -\frac{6}{7} \end{array}\right) \xrightarrow[R_2+3R_3 \to R_2]{R_1+4R_3 \to R_1} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & \frac{41}{7} & 4 & -\frac{24}{7} \\ 0 & 1 & 0 & \frac{22}{7} & 2 & -\frac{18}{7} \\ 0 & 0 & 1 & \frac{12}{7} & 0 & -\frac{6}{7} \end{array}\right)$$

정답 !

$$A^{-1} = \begin{pmatrix} \frac{41}{7} & 4 & -\frac{24}{7} \\ \frac{22}{7} & 2 & -\frac{18}{7} \\ \frac{12}{7} & 0 & -\frac{6}{7} \end{pmatrix}$$

18. $\left(\begin{array}{cccc|cccc} 0 & 0 & -2 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 4 & 0 & 1 & 0 & 0 \\ 0 & -2 & 1 & 0 & 0 & 0 & 1 & 0 \\ 3 & -1 & 1 & -2 & 0 & 0 & 0 & 1 \end{array}\right)$ $\xrightarrow[R_2 \Leftrightarrow R_3]{R_1 \Leftrightarrow R_2}$ $\left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 4 & 0 & 1 & 0 & 0 \\ 0 & -2 & 1 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & -2 & 0 & 1 & 0 & 0 & 0 \\ 3 & -1 & 1 & -2 & 0 & 0 & 0 & 1 \end{array}\right)$

$-\frac{1}{2}R_3$

$\left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 4 & 0 & 1 & 0 & 0 \\ 0 & -2 & 1 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 3 & -1 & 1 & -2 & 0 & 0 & 0 & 1 \end{array}\right)$ $\xrightarrow[-R_3+R_4 \to R_4]{-R_3+R_2 \to R_2}$ $\left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 4 & 0 & 1 & 0 & 0 \\ 0 & -2 & 0 & 0 & \frac{1}{2} & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 3 & -1 & 0 & -2 & \frac{1}{2} & 0 & 0 & 1 \end{array}\right)$

$\left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 4 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & -\frac{1}{4} & 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 3 & -1 & 0 & -2 & \frac{1}{2} & 0 & 0 & 1 \end{array}\right)$ $\xrightarrow{R_2+R_4 \to R_4}$ $\left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 4 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & -\frac{1}{4} & 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 3 & 0 & 0 & -2 & \frac{1}{4} & 0 & -\frac{1}{2} & 1 \end{array}\right)$

$-3R_1+R_4 \to R_4$

$\left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 4 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & -\frac{1}{4} & 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & -14 & \frac{1}{4} & -3 & -\frac{1}{2} & 1 \end{array}\right)$ $\xrightarrow{-\frac{1}{14}R_4}$ $\left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 4 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & -\frac{1}{4} & 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & -\frac{1}{56} & \frac{3}{14} & \frac{1}{28} & -\frac{1}{14} \end{array}\right)$

$-4R_4+R_1 \to R_1$

$\left(\begin{array}{cccc|cccc} 1 & 0 & 0 & 0 & \frac{1}{14} & \frac{1}{7} & -\frac{1}{7} & \frac{2}{7} \\ 0 & 1 & 0 & 0 & -\frac{1}{4} & 0 & -\frac{1}{2} & 0 \\ 0 & 0 & 1 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & -\frac{1}{56} & \frac{3}{14} & \frac{1}{28} & -\frac{1}{14} \end{array}\right)$

정답!
오빠!

$$A^{-1} = \begin{pmatrix} \frac{1}{14} & \frac{1}{7} & -\frac{1}{7} & \frac{2}{7} \\ -\frac{1}{4} & 0 & -\frac{1}{2} & 0 \\ -\frac{1}{2} & 0 & 0 & 0 \\ -\frac{1}{56} & \frac{3}{14} & \frac{1}{28} & -\frac{1}{14} \end{pmatrix}$$

19. $\begin{pmatrix} 2 & -4 & -2 & 1 \\ 3 & -1 & 6 & 2 \\ -1 & 3 & 1 & 5 \\ 1 & -2 & 1 & -3 \end{pmatrix} \xrightarrow[R_4+R_3\to R_4]{\substack{R_1+2R_3\to R_1 \\ R_2+3R_3\to R_2}} \begin{pmatrix} 0 & 2 & 0 & 11 \\ 0 & 8 & 9 & 17 \\ -1 & 3 & 1 & 5 \\ 0 & 1 & 2 & 2 \end{pmatrix}$

$\det(A) = \cancel{+(-1)} -1 \begin{vmatrix} 2 & 0 & 11 \\ 8 & 9 & 17 \\ 1 & 2 & 2 \end{vmatrix} \xrightarrow[R_2-8R_3\to R_2]{R_1-2R_3\to R_1} -1 \begin{vmatrix} 0 & -4 & 7 \\ 0 & -7 & 1 \\ 1 & 2 & 2 \end{vmatrix} = -1 \cdot 1 \begin{vmatrix} -4 & 7 \\ -7 & 1 \end{vmatrix}$

$= -1 \cdot 1 \cdot (-4+49) = -45$

정답 : $\boxed{-45}$