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Note: 풀이과정이 없는 답은 0점 처리됨. 간결하고 읽을 수 있도록 정자체로 쓸것.

1. (page 199) 3.1 연습문제 6

여인수전개 4행으로 하면

$$\begin{aligned}
 & \left[\begin{array}{rrr} 3 & 5 & -8 \\ 0 & -2 & 3 \\ 0 & 0 & 1 \\ 0 & 0 & 2 \end{array} \right] \rightarrow 2 \left((-1)^{1+1} \times 0 \times \left| \begin{array}{rr} 5 & -8 \\ 2 & 3 \end{array} \right| \right. \\
 & = 2 \times (-1)^1 \times \left[\begin{array}{rr} 3 & 5 \\ 0 & -2 \\ 0 & 1 \end{array} \right] \left. + (-1)^{1+2} \times 0 \times \left| \begin{array}{rr} 3 & -8 \\ 0 & 3 \end{array} \right| \right. \\
 & = 2 \left[\begin{array}{rr} 3 & 5 \\ 0 & -2 \\ 0 & 1 \end{array} \right] \left. + (-1)^{1+3} \times \left| \begin{array}{rr} 3 & 5 \\ 0 & -2 \end{array} \right| \right) \\
 & = 2 \left[\begin{array}{rr} 3 & 5 \\ 0 & -2 \\ 0 & 1 \end{array} \right] \quad \text{...} \\
 & \quad \circlearrowleft \quad = 2 \left[\begin{array}{r} 3 \\ 0 \\ -2 \end{array} \right] \\
 & = 2(-6-0) \\
 & = -12
 \end{aligned}$$

2. (page 199) 3.1 연습문제 7

여인수 2행 3 전개하면

$$\begin{aligned}
 & \left[\begin{array}{rrr} 4 & 0 & -1 \\ 0 & 0 & 2 \\ 0 & 2 & 0 \\ \hline 0 & -6 & 4 \\ 5 & 0 & 5 \\ 0 & 0 & 9 \end{array} \right] \rightarrow = 3(-1)^{2+2} \cdot 2 \cdot \left| \begin{array}{rr} 4 & -5 \\ 5 & 2 \\ 0 & -1 \end{array} \right| \\
 & = (-1)^{2+2} \cdot 3 \cdot \left[\begin{array}{rrr} 4 & -1 & -5 \\ 0 & 2 & 0 \\ 5 & 5 & 2-3 \\ 0 & 9 & -12 \end{array} \right] \quad = -6 \left| \begin{array}{rr} 4 & -5 \\ 5 & 2 \\ 0 & -1 \end{array} \right| \\
 & = -3 \left[\begin{array}{rrr} 4 & -1 & -5 \\ 0 & 2 & 0 \\ 5 & 5 & 2-3 \\ 0 & 9 & -12 \end{array} \right] \quad = -6 \left((-1)^{1+1} \cdot 0 \times \left| \begin{array}{r} -5 \\ 2-3 \end{array} \right| \right. \\
 & \quad \text{...} \quad \left. + (-1)^{1+2} \times -1 \times \left| \begin{array}{r} 4-5 \\ 5-3 \end{array} \right| \right. \\
 & \quad \text{...} \quad \left. + (-1)^{1+3} \times 2 \times \left| \begin{array}{r} 4-5 \\ 5-2 \end{array} \right| \right) \\
 & = -6 ((-12 - (-25)) + 2(8+5)) \\
 & = -6(13-14) \\
 & = -6 \quad \text{...} \quad \circlearrowleft \quad = -6
 \end{aligned}$$

를 2행에 대해서
여인수 전개하면

3. (page 200) 3.1 연습문제 9 Note: 3×3 형렬의 행렬식 전개 방식(p. 200 그림참조)으로 풀것

$$\begin{aligned}
 & + (-2) + (-8) + (36) \\
 & - (3) - (16) - (12) \\
 & = -5 \\
 \therefore -5 & = \text{행렬식}
 \end{aligned}$$

4. (page 209) 3.2 연습문제 5

$$\left[\begin{array}{ccc|c} -1 & -3 & 0 & 0 \\ 0 & 1 & 5 & 4 \\ -1 & 2 & 8 & 5 \\ 3 & -1 & -2 & 3 \end{array} \right] \xrightarrow{\textcircled{1}} \left[\begin{array}{ccc|c} 1 & -3 & 0 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & 0 & -3 & 2 \\ 0 & 0 & 0 & 1 \end{array} \right]$$

$$|x| \times -3x |$$

$$= -3$$

$$\therefore -3$$

$$\textcircled{1} + \textcircled{2} \rightarrow \textcircled{2}$$

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

$$\sim \left[\begin{array}{ccc|c} -1 & -3 & 0 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & 1 & 5 & 5 \\ 0 & 5 & 22 & 18 \end{array} \right] \xrightarrow{-\textcircled{5}} \left[\begin{array}{ccc|c} -1 & -3 & 0 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \end{array} \right]$$

$$\textcircled{5} - \textcircled{4} \rightarrow \textcircled{4}$$

$$\sim \left[\begin{array}{ccc|c} -1 & -3 & 0 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 22 & 18 \end{array} \right] \sim \left[\begin{array}{ccc|c} -1 & -3 & 0 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 3 & 2 \end{array} \right]$$

5. (page 209) 3.2 연습문제 10

$$\left| \begin{array}{ccc|c} a & b & c & -1 \\ 2d+a & 2e+b & 2f+c & -2 \\ g & h & i & \end{array} \right|$$

$$\textcircled{2} \leftarrow \textcircled{2} - \textcircled{1}$$

$$\sim \left| \begin{array}{ccc|c} a & b & c & -1 \\ 0 & 2e & 2f & -2 \\ g & h & i & \end{array} \right|$$

$$\sim 2 \left| \begin{array}{ccc|c} ab & bc & ca & -2 \\ 0 & f & f & -2 \\ gh & hi & ig & \end{array} \right| = 2 \times 1$$

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6. (page 209) 3.2 연습문제 12

$$\left| \begin{array}{ccc|c} 2 & 0 & 0 & 8 \\ 1 & -1 & -5 & 0 \\ 2 & 8 & 6 & 0 \\ 0 & 7 & 5 & 4 \end{array} \right|$$

| 행으로 여인수 전개법

$$(-1)^{(1+1)} 2 \left| \begin{array}{ccc|c} -1 & -5 & 0 & 0 \\ 8 & 6 & 0 & 0 \\ 1 & -1 & -5 & 4 \end{array} \right| + 0 + 0$$

$$+ 8 (-1)^{(1+4)} \left| \begin{array}{ccc|c} 1 & -1 & -5 & 0 \\ 3 & 8 & 6 & 0 \\ 0 & 7 & 5 & 4 \end{array} \right|$$

$$= 2 \left| \begin{array}{ccc|c} -1 & -5 & 0 & 0 \\ 8 & 6 & 0 & 0 \\ 5 & 5 & 4 & 0 \end{array} \right| - 8 \left| \begin{array}{ccc|c} -1 & -5 & 0 & 0 \\ 3 & 8 & 6 & 0 \\ 0 & 7 & 5 & 0 \end{array} \right|$$

3열로 여인수전치법

$$= 0 + 0 + (-1)^{3+3} \times 4 \left| \begin{array}{cc|c} -1 & -5 & 0 \\ 8 & 6 & 0 \\ 5 & 5 & 4 \end{array} \right|$$

$$= 4 \left| \begin{array}{cc|c} -42 & 40 & 0 \\ -2 & & 0 \end{array} \right| = -8$$

1행으로 여인수전치법

$$\left| \begin{array}{ccc|c} 2 & 0 & 0 & 8 \\ 1 & -1 & -5 & 0 \\ 2 & 8 & 6 & 0 \\ 0 & 7 & 5 & 4 \end{array} \right| = (-1)^{1+1} \cdot 1 \cdot \left| \begin{array}{cc|c} 8 & 6 & 0 \\ 7 & 5 & 4 \end{array} \right| + (-1)^{1+2} \cdot 3 \cdot \left| \begin{array}{cc|c} 2 & 0 & 0 \\ 1 & -1 & -5 \end{array} \right|$$

$$= (40 - 42) - 3 / (-25 + 35)$$

$$= -2$$

$$\therefore 2(-8) - 8(-2) = 0$$