

# 3.4.2.

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

$\Rightarrow$  cofactor matrix is

$$C = \begin{bmatrix} 2 & 1 & -4 \\ -7 & -7 & 7 \\ -6 & -3 & 5 \end{bmatrix}$$

$\Rightarrow$  adjoint matrix is

$$(a) \text{ adj}(A) = C^t = \begin{bmatrix} 2 & -7 & -6 \\ 1 & -7 & -3 \\ -4 & 7 & 5 \end{bmatrix}$$

$$(b) \det(A) = -7$$

$$A \cdot \text{adj}(A) = \begin{bmatrix} 2 & 1 & 3 \\ -1 & 2 & 0 \\ 3 & -2 & 1 \end{bmatrix} \begin{bmatrix} 2 & -7 & -4 \\ 1 & -7 & -3 \\ -4 & 7 & 5 \end{bmatrix}$$

$$= \begin{bmatrix} -7 & 0 & 0 \\ 0 & -7 & 0 \\ 0 & 0 & -7 \end{bmatrix}$$

$$= -7 I_3$$

$$= \det(A) I_3$$

# 3.5.1

$$A = \begin{bmatrix} 2 & 4 & 6 \\ 1 & 0 & 2 \\ 2 & 3 & -1 \end{bmatrix}, \quad \vec{b} = \begin{bmatrix} 2 \\ 0 \\ -5 \end{bmatrix}, \quad \vec{x} = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

$$|A| = 26$$

$$|A_1| = \begin{vmatrix} 2 & 4 & 6 \\ 0 & 0 & 2 \\ -5 & 3 & -1 \end{vmatrix} = -52$$

$$|A_2| = \begin{vmatrix} 2 & 2 & 6 \\ 1 & 0 & 2 \\ 2 & -5 & -1 \end{vmatrix} = 0$$

$$|A_3| = \begin{vmatrix} 2 & 4 & 2 \\ 1 & 0 & 0 \\ 2 & 3 & -5 \end{vmatrix} = 26$$

$$\therefore x_1 = \frac{-52}{26} = -2, \quad x_2 = 0, \quad x_3 = \frac{26}{26} = 1$$