샘플 Quiz I.

1.

$$\alpha = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 4 & 3 & 5 & 1 & 2 \end{pmatrix}$$

$$\beta^{-1} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 2 & 4 & 1 & 3 & 5 \end{pmatrix}$$

$$\therefore \alpha\beta^{-1} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 1 & 4 & 5 & 2 \end{pmatrix}$$

2.

$$\begin{vmatrix} t+3 & -1 & 1 \\ 5 & t-3 & 1 \\ 6 & -6 & t+4 \end{vmatrix}$$

$$= (t+3)\{(t-3)(t+4)+6\} + 1\cdot\{5(t+4)-6\} + 1\cdot\{-30-6(t-3)\}$$

$$= (t+3)^2(t-2) + 5t+14-6t-12$$

$$= (t+3)^2(t-2) - (t-2)$$

$$= ((t+3)^2-1)(t-2)\Big|_{t=-3} = \boxed{5}$$

3.

$$\begin{vmatrix} 3-x & 5+x & 1 \\ 7+2x & 3-2x & 2 \\ 11-3x & 11+3x & 3 \end{vmatrix}$$

$$= (3-x)\{3(3-2x)-2(11+3x)\}$$
$$-(5+x)\{3(7+2x)-2(11-3x)\}$$
$$+\{(7+2x)(11+3x)-(3-2x)(11-3x)\}$$
$$= (3-x)(-25-12x) - (5+x)(-1+12x) + (86+86x)$$
$$= 16+16x = 0$$

$$\therefore \boxed{x=-1}$$

4.

$$D = \begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 3 & 1 & -2 \end{vmatrix} = 3$$

$$D_1 = \begin{vmatrix} 9 & 2 & 3 \\ 24 & 5 & 6 \\ 4 & 1 & -2 \end{vmatrix} = 9(-16) - 2(-72) + 3(4) = 12$$

$$D_2 = \begin{vmatrix} 1 & 9 & 3 \\ 4 & 24 & 6 \\ 3 & 4 & -2 \end{vmatrix} = -72 - 9(-26) + 3(-56) = -6$$

$$D_3 = \begin{vmatrix} 1 & 2 & 9 \\ 4 & 5 & 24 \\ 3 & 1 & 4 \end{vmatrix} = -4 - 2(-56) + 9(-11) = 9$$

$$\therefore x_1 = D_1/D = \boxed{4},\ x_2 = D_2/D = \boxed{-2},\ x_3 = D_3/D = \boxed{3}$$