I (2005/07/07)

(Text p.27)

1.

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

2.

$$\begin{vmatrix} -4 & -4 & 4 \\ 4 & -4 & 2 \\ 3 & 5 & -4 \end{vmatrix}$$

3.

$$\begin{vmatrix} -4 & 5 & 0 \\ 3 & 4 & 2 \\ -3 & 0 & 3 \end{vmatrix}$$

4.

$$\begin{vmatrix} 2 & -2 & -3 \\ -1 & 1 & -2 \\ -2 & -1 & -4 \end{vmatrix}$$

5.

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

6.

$$\begin{vmatrix} -4 & 0 & -4 \\ -3 & 0 & 5 \\ 2 & -5 & 3 \end{vmatrix}$$

7.

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

8.

$$\begin{vmatrix} -3 & 5 & -4 \\ -4 & 4 & 5 \\ -2 & 3 & 2 \end{vmatrix}$$

9.

$$\begin{vmatrix} -1 & -3 & -3 \\ 1 & -2 & 1 \\ 3 & 0 & 4 \end{vmatrix}$$

10.

$$\begin{vmatrix} 0 & 5 & 4 \\ -5 & -4 & 5 \\ -4 & -5 & -1 \end{vmatrix}$$

11.

$$\begin{vmatrix} 0 & -4 & -4 \\ -5 & -4 & -5 \\ 5 & -2 & 2 \end{vmatrix}$$

12.

$$\begin{vmatrix} 2 & 1 & -2 \\ -2 & 5 & 0 \\ -1 & -2 & 3 \end{vmatrix}$$

1.

$$
\begin{vmatrix} -2 & -4 & -4 \\ -5 & 5 & 1 \\ 2 & -3 & -2 \end{vmatrix} = \begin{matrix} (-2) \times 5 \times (-2) & + & (-4) \times 1 \times 2 & + & (-4) \times (-5) \times (-3) \\ - & (-2) \times 1 \times (-3) & - & (-4) \times (-5) \times (-2) & - & (-4) \times 5 \times 2 \end{matrix}
$$
$$
= 26
$$

2.

$$
\begin{vmatrix} -4 & -4 & 4 \\ 4 & -4 & 2 \\ 3 & 5 & -4 \end{vmatrix} = \begin{matrix} (-4) \times (-4) \times (-4) & + & (-4) \times 2 \times 3 & + & 4 \times 4 \times 5 \\ - & (-4) \times 2 \times 5 & - & (-4) \times 4 \times (-4) & - & 4 \times (-4) \times 3 \end{matrix}
$$
$$
= 16
$$

3.

$$
\begin{vmatrix} -4 & 5 & 0 \\ 3 & 4 & 2 \\ -3 & 0 & 3 \end{vmatrix} = \begin{matrix} (-4) \times 4 \times 3 & + & 5 \times 2 \times (-3) & + & 0 \times 3 \times 0 \\ - & (-4) \times 2 \times 0 & - & 5 \times 3 \times 3 & - & 0 \times 4 \times (-3) \end{matrix}
$$
$$
= -123
$$

4.

$$
\begin{vmatrix} 2 & -2 & -3 \\ -1 & 1 & -2 \\ -2 & -1 & -4 \end{vmatrix} = \begin{matrix} 2 \times 1 \times (-4) & + & (-2) \times (-2) \times (-2) & + & (-3) \times (-1) \times (-1) \\ - & 2 \times (-2) \times (-1) & - & (-2) \times (-1) \times (-4) & - & (-3) \times 1 \times (-2) \end{matrix}
$$
$$
= -21
$$

5.

$$
\begin{vmatrix} 4 & 4 & -4 \\ 5 & 5 & -2 \\ 1 & 3 & -3 \end{vmatrix} = \begin{matrix} 4 \times 5 \times (-3) & + & 4 \times (-2) \times 1 & + & (-4) \times 5 \times 3 \\ - & 4 \times (-2) \times 3 & - & 4 \times 5 \times (-3) & - & (-4) \times 5 \times 1 \end{matrix}
$$
$$
= -24
$$

6.

$$
\begin{vmatrix} -4 & 0 & -4 \\ -3 & 0 & 5 \\ 2 & -5 & 3 \end{vmatrix} = \begin{matrix} (-4) \times 0 \times 3 & + & 0 \times 5 \times 2 & + & (-4) \times (-3) \times (-5) \\ - & (-4) \times 5 \times (-5) & - & 0 \times (-3) \times 3 & - & (-4) \times 0 \times 2 \end{matrix}
$$
$$
= -160
$$

7.

$$\begin{vmatrix} -2 & -5 & -2 \\ 5 & 2 & -1 \\ -4 & 4 & 3 \end{vmatrix} = \begin{array}{l} (-2) \times 2 \times 3 + (-5) \times (-1) \times (-4) + (-2) \times 5 \times 4 \\ - (-2) \times (-1) \times 4 - (-5) \times 5 \times 3 - (-2) \times 2 \times (-4) \end{array}$$
$$= -21$$

8.

$$\begin{vmatrix} -3 & 5 & -4 \\ -4 & 4 & 5 \\ -2 & 3 & 2 \end{vmatrix} = \begin{array}{l} (-3) \times 4 \times 2 + 5 \times 5 \times (-2) + (-4) \times (-4) \times 3 \\ - (-3) \times 5 \times 3 - 5 \times (-4) \times 2 - (-4) \times 4 \times (-2) \end{array}$$
$$= 27$$

9.

$$\begin{vmatrix} -1 & -3 & -3 \\ 1 & -2 & 1 \\ 3 & 0 & 4 \end{vmatrix} = \begin{array}{l} (-1) \times (-2) \times 4 + (-3) \times 1 \times 3 + (-3) \times 1 \times 0 \\ - (-1) \times 1 \times 0 - (-3) \times 1 \times 4 - (-3) \times (-2) \times 3 \end{array}$$
$$= -7$$

10.

$$\begin{vmatrix} 0 & 5 & 4 \\ -5 & -4 & 5 \\ -4 & -5 & -1 \end{vmatrix} = \begin{array}{l} 0 \times (-4) \times (-1) + 5 \times 5 \times (-4) + 4 \times (-5) \times (-5) \\ - 0 \times 5 \times (-5) - 5 \times (-5) \times (-1) - 4 \times (-4) \times (-4) \end{array}$$
$$= -89$$

11.

$$\begin{vmatrix} 0 & -4 & -4 \\ -5 & -4 & -5 \\ 5 & -2 & 2 \end{vmatrix} = \begin{array}{l} 0 \times (-4) \times 2 + (-4) \times (-5) \times 5 + (-4) \times (-5) \times (-2) \\ - 0 \times (-5) \times (-2) - (-4) \times (-5) \times 2 - (-4) \times (-4) \times 5 \end{array}$$
$$= -60$$

12.

$$\begin{vmatrix} 2 & 1 & -2 \\ -2 & 5 & 0 \\ -1 & -2 & 3 \end{vmatrix} = \begin{array}{l} 2 \times 5 \times 3 + 1 \times 0 \times (-1) + (-2) \times (-2) \times (-2) \\ - 2 \times 0 \times (-2) - 1 \times (-2) \times 3 - (-2) \times 5 \times (-1) \end{array}$$
$$= 18$$