

Th 2.7/2.4 Calculate the determinants.

$$A = \begin{vmatrix} 5 & -4 \\ 1 & 2 \end{vmatrix} = 5 \cdot 2 - (-4) \cdot 1 = \underline{\underline{14}}$$

$$A = \begin{vmatrix} 5 & -4 \\ 1 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & 2 \\ 5 & -4 \end{vmatrix} = - \begin{vmatrix} 1 & 2 \\ 0 & -14 \end{vmatrix} = -(-14) = 14$$

(II) \leftrightarrow (VI) (II) - 5(II)

$$\underline{B} = \begin{vmatrix} 5 & -4 & 6 \\ 1 & 2 & 3 \\ 0 & -1 & 0 \end{vmatrix} = 5 \cdot (2 \cdot 0 + 3 \cdot 1) + (-4) \cdot (1 \cdot 0 + 3 \cdot 0) + 6 \cdot (1 \cdot -1 - 2 \cdot 2) = 5 \cdot 2 + (-4) \cdot 3 + 6 \cdot (-5) = 10 - 12 - 30 = -32 + 8 = \underline{\underline{-24}}$$

$$\underline{B} = \begin{vmatrix} 0 & -4 \\ 1 & -2 \\ 1 & 0 \end{vmatrix}$$

$$\underline{C} = \begin{vmatrix} 1 & 3 & 2 \\ -2 & -3 & 0 \\ -1 & 3 & 6 \\ -1 & 2 & 0 \end{vmatrix} = 0$$

+ - + +
- + - +
+ - + +
+ - + +

$D =$

$$D = \begin{vmatrix} 0 & -4 & 6 \\ 1 & -2 & 3 \\ 1 & 0 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -2 & 3 \\ 0 & -4 & 6 \\ 1 & 0 & 2 \end{vmatrix} = - \begin{vmatrix} 1 & -2 & 3 \\ 0 & -4 & 6 \\ 0 & 2 & 1 \end{vmatrix} = - \begin{vmatrix} 1 & -2 & 3 \\ 0 & \cancel{-4} & 6 \\ 0 & 0 & 1 \end{vmatrix} = -1(-4)2 = 8$$

$$D = \begin{vmatrix} 1 & 3 & 2 & -7 \\ -2 & -3 & 0 & 2 \\ -1 & 3 & 6 & 1 \\ -1 & 2 & 0 & 0 \end{vmatrix} = +1 \begin{vmatrix} \cancel{3} & \cancel{2} & \cancel{-7} \\ \cancel{-3} & \cancel{0} & \cancel{2} \\ \cancel{3} & \cancel{6} & \cancel{1} \\ \cancel{2} & \cancel{0} & \cancel{0} \end{vmatrix} + 2 \begin{vmatrix} \cancel{1} & \cancel{2} & \cancel{-7} \\ \cancel{-2} & \cancel{0} & \cancel{2} \\ \cancel{3} & \cancel{6} & \cancel{1} \\ \cancel{1} & \cancel{6} & \cancel{0} \end{vmatrix} = (0 - 92 + 18 - 0 + 6 - 36) + 2(0 - 4 + 12 - 0 + 4 - 12) = 0 + 2 \cdot (0) = 0$$

$$D = \begin{pmatrix} 1 & 0 & 1 & \dots & 1 \\ 1 & 1 & 0 & \dots & 1 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & 1 & 1 & \dots & 0 \end{pmatrix}_{n \times n}$$

$$\begin{vmatrix} -2 & 3 \\ -7 & 6 \\ 0 & 0 \end{vmatrix} = -1(-4)2 =$$

8

$$2 + 18 - 0 + 6^{-36} +$$

0

$$\begin{vmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 3 & 4 & 5 & 6 & 7 & 8 & 1 & 2 \\ 4 & 5 & 6 & 7 & 8 & 1 & 2 & 3 \\ 5 & 6 & 7 & 8 & 1 & 2 & 3 & 4 \\ 6 & 7 & 8 & 1 & 2 & 3 & 4 & 5 \\ 7 & 8 & 1 & 2 & 3 & 4 & 5 & 6 \\ 8 & 1 & 2 & 3 & 4 & 5 & 6 & 7 \end{vmatrix}^2$$



Th 27/2.4

Calculate the determinant.

$$C = \begin{vmatrix} 1 & 3 & 2 & -1 \\ -2 & -3 & 0 & 2 \\ -7 & 3 & 6 & 1 \\ -1 & 2 & 0 & 0 \end{vmatrix} =$$

$$\begin{array}{l} (I) + 2(I) \\ (III) + (I) \\ (IV) + (I) \end{array} \begin{vmatrix} 1 & 3 & 2 & -1 \\ 0 & 3 & 4 & 0 \\ 0 & 6 & 8 & 0 \\ 0 & 5 & 2 & -1 \end{vmatrix} = \begin{array}{l} (III) - 2(II) \\ (IV) - \frac{5}{3}(II) \end{array}$$

$$= \begin{vmatrix} 1 & 3 & 2 & -1 \\ 0 & 3 & 4 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{10}{3} & -7 \end{vmatrix} = 0$$

$$= \begin{vmatrix} 1 & 3 & 2 & -1 \\ 0 & 3 & 4 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{10}{3} & -7 \end{vmatrix} = 0$$

$$\begin{aligned} D_{h \times h} &= \begin{vmatrix} 1 & 1 & 1 & \dots & 1 \\ 1 & 0 & 1 & \dots & 1 \\ 1 & 1 & 0 & \dots & 1 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & 1 & 1 & \dots & 0 \end{vmatrix} = (-1)^{h-1} \begin{vmatrix} 1 & 1 & 1 & \dots & 1 \\ 0 & -1 & 0 & \dots & 0 \\ 0 & 0 & -1 & \dots & 0 \\ 0 & 0 & 0 & \dots & -1 \end{vmatrix} \\ &= \begin{pmatrix} 2 \\ 3 \end{pmatrix} \end{aligned}$$

$$A = \begin{pmatrix} 1 & 1 & 1 & \dots & 1 \\ 0 & -1 & 0 & \dots & 0 \\ 0 & 0 & -1 & \dots & 0 \\ 0 & 0 & 0 & \dots & -1 \end{pmatrix}$$

$$B = \begin{pmatrix} 1 & 1 & 1 & \dots & 1 \\ 1 & 0 & 1 & \dots & 1 \\ 1 & 1 & 0 & \dots & 1 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & 1 & 1 & \dots & 0 \end{pmatrix}$$

$$D = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$$

$$= -[1] \begin{pmatrix} 1 & 1 & 1 & \dots & 1 \\ 0 & -1 & 0 & \dots & 0 \\ 0 & 0 & -1 & \dots & 0 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & 0 & \dots & -1 \end{pmatrix}$$

$$A = \begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix} = 2 \cdot 2 - 1 \cdot 1 = \underline{\underline{3}}$$

$$B = \begin{pmatrix} 2 & 1 \\ 2 & 4 \end{pmatrix} = 2 \cdot 4 - 1 \cdot 2 = \underline{\underline{6}}$$

$$C = \begin{pmatrix} 2 & 1 \\ 3 & 6 \end{pmatrix} = 2 \cdot 6 - 1 \cdot 3 = \underline{\underline{9}}$$

$$D = \begin{pmatrix} 2 & 1 \\ 5 & 4 \end{pmatrix} = 2 \cdot 4 - 1 \cdot 5 = \underline{\underline{3}}$$