

Topic List

- * ✓ বিস্তার না করে প্রমাণ — চ নির্ণায়কের ধর্ম উল্লেখ করে .
- * ✓ সমাধান কর
- * ✓ বিপরীত ম্যাট্রিক্সের সাহায্যে সমাধান

$$\begin{vmatrix} 1 & bc & bc(b+c) \\ 1 & ca & ca(c+a) \\ 1 & ab & ab(a+b) \end{vmatrix} = abc \begin{vmatrix} a & 1 & b+c \\ b & 1 & c+a \\ c & 1 & a+b \end{vmatrix} = 0$$

$$\frac{1}{abc} \begin{vmatrix} a & abc & abc(b+c) \\ b & abc & abc(c+a) \\ c & abc & abc(a+b) \end{vmatrix}$$

$$= \frac{(abc)(abc)}{abc} \begin{vmatrix} a & 1 & b+c \\ b & 1 & c+a \\ c & 1 & a+b \end{vmatrix}$$

$$= abc \begin{vmatrix} a+b+c & 1 & b+c \\ a+b+c & 1 & c+a \\ a+b+c & 1 & a+b \end{vmatrix} \quad [C_1 = C_1 + C_3]$$

$$= abc(a+b+c) \begin{vmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{vmatrix} \begin{vmatrix} b+c \\ c+a \\ a+b \end{vmatrix} = 0$$

$$\begin{vmatrix} bc & ca & ab \\ 1 & 1 & 1 \\ \frac{1}{a} & \frac{1}{b} & \frac{1}{c} \\ \frac{1}{a} + b & \frac{1}{b} + c & \frac{1}{c} + a \end{vmatrix} = 0$$

$$= \frac{1}{abc} \begin{vmatrix} abc & abc & abc \\ 1 & 1 & 1 \\ 1+ab & 1+bc & 1+ac \end{vmatrix}$$

$$= \frac{\cancel{abc}}{\cancel{abc}} \begin{vmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1+ab & 1+bc & 1+ac \end{vmatrix}$$

$$= 0 \quad (An)$$

$$\begin{vmatrix} x^2 & x & 2 \\ 2 & 1 & 1 \\ 0 & 0 & -5 \end{vmatrix} = 0 \quad \text{সমাধান কর।}$$

$$\Rightarrow (-5) \times \begin{vmatrix} x^2 & x \\ 2 & 1 \end{vmatrix} = 0$$

$$\Rightarrow (x^2 - 2x) = 0$$

$$\Rightarrow x(x-2) = 0$$

$$\boxed{\therefore x = 0, 2}$$

$$\begin{vmatrix} 4 & 2+x & 3 \\ 2 & 3 & 4+x \end{vmatrix} = 0$$

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$$\Rightarrow \begin{vmatrix} 9+x & 4 & 2 \\ 9+x & 2+x & 3 \\ 9+x & 3 & 4+x \end{vmatrix} = 0 \quad [C_1 = C_1 + C_2 + C_3]$$

$$\Rightarrow (9+x) \begin{vmatrix} 4 & 2 \\ 2+x & 3 \\ 3 & 4+x \end{vmatrix} = 0$$

$$9+x=0 \rightarrow x=-9$$

$$x^2-3=0 \rightarrow x=\pm\sqrt{3}$$

(A₂)

$$\Rightarrow (9+x) \begin{vmatrix} 0 & 2-x & -1 \\ 0 & x-1 & -1-x \\ 1 & 3 & 4+x \end{vmatrix} = 0 \quad \begin{matrix} r'_1 = r_1 - r_2 \\ r'_2 = r_2 - r_3 \end{matrix}$$

$$\Rightarrow (9+x) \begin{vmatrix} 2-x & -1 \\ x-1 & -(x+1) \end{vmatrix} = 0$$

$$\Rightarrow (9+x) \{ -(x+1)(2-x) + (x-1) \} = 0$$

$$\Rightarrow (9+x) \{ -(2x-x^2+2-x) + x-1 \} = 0$$

$$\Rightarrow (9+x) \{ -2x+x^2-2+x+x-1 \} = 0$$

$$\Rightarrow (9+x)(x^2-3) = 0$$

$$\begin{vmatrix} x+4 & 3 & 3 \\ 3 & x+4 & 5 \\ 5 & 5 & x+1 \end{vmatrix} = 0$$

→ (HW) → $x = ?$

→ comment ↷

দাখাও .

$$x + 2y + 5z = 3, 2x - 3y - 7z = 5, 4x - 2y + z = 0$$

বিপরীত ম্যাট্রিক্সের মাধ্যমে সমীকরণ সমাধান

$x = ?$
 $y = ?$
 $z = ?$

$$A = \begin{bmatrix} 1 & 2 & 5 \\ 2 & -3 & -7 \\ 4 & -2 & 1 \end{bmatrix}, B = \begin{bmatrix} x \\ y \\ z \end{bmatrix}, D = \begin{bmatrix} 3 \\ 5 \\ 0 \end{bmatrix}$$

$A^{-1} = ?$
 $D = ?$

Details
সংক্ষেপে

$AB = D$

$B = A^{-1}D$

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 3 \\ 5 \\ -2 \end{bmatrix}$$

$\therefore x = 3$
 $y = 5$
 $z = -2$

সংক্ষেপে
সমাধান