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

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

$(\lambda-4)(\lambda-1)(\lambda-1) + 0 \cdot 0 \cdot 2 + (-1).2 \cdot 0 - 2 \cdot (\lambda-1)(-1) - 0 \cdot 0 \cdot (\lambda-4) - (\lambda-1) \cdot 2 \cdot 0 = 0$

$(\lambda 3 - 6\lambda 3 + 9\lambda - 4) + 0 + 0 - (-2\lambda + 2) - 0 - 0 = 0$

$\lambda 3 - 6\lambda 3 - 11\lambda - 6 = 0$

$\lambda 1 = 1 ; \lambda 2 = 2 ; \lambda 3 = 3$

$\lambda 1 = 1$

$(A-\lambda 1)X = 0$

$$\begin{vmatrix} 3 & 0 & -1 \\ 2 & 0 & 0 \\ 2 & 0 & 0 \end{vmatrix} \cdot \begin{vmatrix} x1 \\ x2 \\ x3 \end{vmatrix} = 0$$

$3\lambda 1 - x3 = 0$
$2x1 = 0$
$2x1 = 0$

-> $x1 = 0 ; x2 = x3 ; x3 = 0$
$x2 = 1$

$$V1 = \begin{vmatrix} 0 \\ 1 \\ 0 \end{vmatrix}$$

$\lambda 2 = 2$

$(A-\lambda 2)X = 0$

$$\begin{vmatrix} -2 & 0 & -1 \\ 2 & 1 & 0 \\ 2 & 0 & 1 \end{vmatrix} \cdot \begin{vmatrix} x1 \\ x2 \\ x3 \end{vmatrix} = 0$$

$-2x1 - x3 = 0$
$2x1 + x2 = 0$
$2x1 + x3 = 0$

$x2 - x3 = 0$

-> $x1 = -1/2x3$

$x1 = -1/2x3 ; x2 = x3 ; x3 = x3$

$$\begin{vmatrix} V2 & -1/2 \\ x3 = 1 & 1 \\ & 1 \end{vmatrix}$$

$\lambda 3 = 3$

$(A-\lambda 3)X = 0$

$$\begin{vmatrix} -1 & 0 & -1 \\ 2 & 2 & 0 \\ 2 & 0 & 2 \end{vmatrix} \cdot \begin{vmatrix} x1 \\ x2 \\ x3 \end{vmatrix} = 0$$

$-x1 - x3 = 0$
$2x1 + 2x2 = 0$
$2x1 + 2x3 = 0$

$x1 = -x3 ; x2 = x3 ; x3 = x3$

$$\begin{vmatrix} V3 & -1 \\ x3 = 1 & 1 \\ & 1 \end{vmatrix}$$

$$P = \begin{vmatrix} 0 & -1/2 & -1 \\ 1 & 1 & 1 \end{vmatrix}$$

$|p| = (0.1.1) + ((-1/3).1.0) + ((-1).1.1) - (0.1.(-1)) - (1.1.0) - (1.1.(-1/3))$
$= - 1/2$

$$\begin{vmatrix} 0 & 1 & 1 \end{vmatrix}$$

Kof P
$$\begin{vmatrix} 0 & -1 & 1 \\ -1/2 & 0 & 0 \\ 1/2 & -1 & 1/2 \end{vmatrix}$$

Adj P
$$\begin{vmatrix} 0 & -1/2 & 1/2 \\ -1 & 0 & -1 \\ 1 & 0 & 1/2 \end{vmatrix}$$

P^-1
$$\begin{vmatrix} 0 & 1 & -1 \\ 2 & 0 & 2 \\ -2 & 0 & -1 \end{vmatrix}$$

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

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

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