

## Lecture - 20

→ Formula for  $A^{-1}$

→ Cramer's Rule for  $x = A^{-1}b$

→  $|\det A| = \text{Volume of box}$

$$A^{-1} = \frac{1}{\det A} C^T$$

$$Ax = b$$

$$x = A^{-1}b = \frac{1}{\det A} C^T b$$

### Cramer's Rule

$$x_1 = \frac{\det B_1}{\det A}$$

$$B_1 = \left[ \begin{array}{c|c} b & \text{columns } A \\ \hline & \end{array} \right]$$

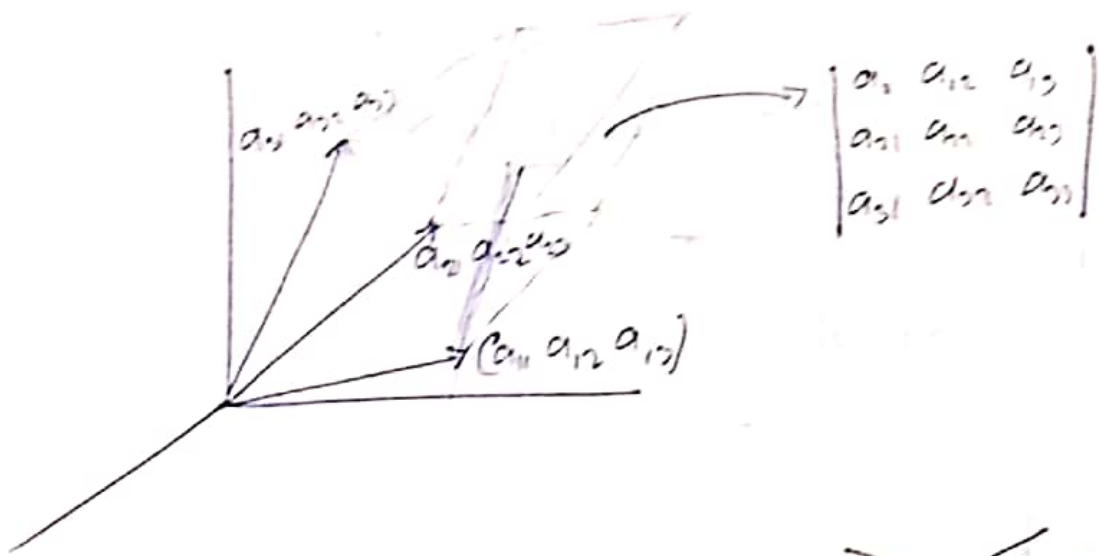
$$x_2 = \frac{\det B_2}{\det A}$$

$\left. \begin{array}{l} A \text{ with} \\ \text{Column 1} \\ \text{replaced} \\ \text{with } b \end{array} \right\}$

$$x_j = \frac{\det B_j}{\det A}$$

$\left. \begin{array}{l} A \text{ with Column } j \\ \text{replaced with } b \end{array} \right\}$

$\det A = \text{Volume of box}$



$$\begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$$