

Inverse of matrix, or matrix Inverse

Let's suppose

$$A = \begin{bmatrix} 4 & -2 \\ 3 & 1 \end{bmatrix}$$

Formula

To calculate A^{-1} ,

$$A^{-1} = \frac{\text{Adj } A}{|A|}$$

————— (1)

$$\text{Adj } A = \begin{bmatrix} 1 & 2 \\ -3 & 4 \end{bmatrix}$$

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

$$= (4)(1) - (3)(-2)$$
$$= 4 + 6$$

$$\boxed{|A| = 10}$$

$$A^{-1} = \frac{\text{Adj } A}{|A|}$$

$$A^{-1} = \frac{\begin{bmatrix} 1 & 2 \\ -3 & 4 \end{bmatrix}}{10} = \begin{bmatrix} \frac{1}{10} & \frac{2}{10} \\ -\frac{3}{10} & \frac{4}{10} \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} \frac{1}{10} & \frac{21}{105} \\ -\frac{3}{10} & \frac{42}{105} \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} \frac{1}{10} & \frac{1}{5} \\ -\frac{3}{10} & \frac{2}{5} \end{bmatrix}$$