

If $A =$

$$\begin{bmatrix} 2 & 2 \\ 9 & 4 \end{bmatrix}$$

And $I =$

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

Then $10A^{-1}$ is equal to

- (a) $A-4I$
- (b) $6I-A$
- (c) $A-6I$
- (d) $4I-A$

Solution:

Given $A =$

$$\begin{bmatrix} 2 & 2 \\ 9 & 4 \end{bmatrix}$$

Characteristic equation of matrix A is $|A-\lambda I| = 0$

$$\begin{vmatrix} 2-\lambda & 2 \\ 9 & 4-\lambda \end{vmatrix} = 0$$

$$\Rightarrow \lambda^2 - 6\lambda - 10 = 0$$

$$\text{So } A^2 - 6A - 10I = 0$$

Multiply by A^{-1}

$$\Rightarrow A^{-1}(A^2) - 6A A^{-1} - 10I A^{-1} = 0$$

$$\Rightarrow A^{-1}A A - 6A A^{-1} - 10I A^{-1} = 0$$

$$\Rightarrow 10A^{-1} = A - 6I$$

Hence option c is the answer.