

Latex Assignment21

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Ex 12.4.5

Find adjoint of each of the matrices in 1 to 2

1. $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

2. $\begin{pmatrix} 1 & -1 & 2 \\ 2 & 3 & 5 \\ -2 & 0 & 1 \end{pmatrix}$

Verify $A(adj A) = (adj A)A = |A|I$ in 1 and 2

3. $\begin{pmatrix} 2 & 3 \\ -4 & -6 \end{pmatrix}$

4. $\begin{pmatrix} 1 & -1 & 2 \\ 3 & 0 & -2 \\ 1 & 0 & 3 \end{pmatrix}$

Find the inverse of each of the matrices (if it exists) given in 1 to 7

5. $\begin{pmatrix} 2 & 2 \\ 4 & 3 \end{pmatrix}$

6. $\begin{pmatrix} -1 & 5 \\ -3 & 2 \end{pmatrix}$

7. $\begin{pmatrix} 1 & 2 & 3 \\ 0 & 2 & 4 \\ 0 & 0 & 5 \end{pmatrix}$

8. $\begin{pmatrix} 1 & 0 & 0 \\ 3 & 3 & 0 \\ 5 & 2 & 1 \end{pmatrix}$

9. $\begin{pmatrix} 2 & 1 & 3 \\ 4 & -1 & 0 \\ -7 & 2 & 1 \end{pmatrix}$

10. $\begin{pmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{pmatrix}$

11. $\begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos \alpha & \sin \alpha \\ 0 & \sin \alpha & -\cos \alpha \end{pmatrix}$

12. Let $A = \begin{pmatrix} 3 & 7 \\ 2 & 5 \end{pmatrix}$ and $B = \begin{pmatrix} 6 & 8 \\ 7 & 9 \end{pmatrix}$. Verify that $(AB)^{-1} = B^{-1}A^{-1}$.

13. Let $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$, show that $A^2 - 5A + 7I = 0$. Hence find A^{-1} .

14. For the matrix $A = \begin{pmatrix} 3 & 2 \\ 1 & 1 \end{pmatrix}$, find the numbers a and b such that $A^2 + aA + bI = 0$.

15. For the matrix $A = \begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 2 & -1 & 3 \end{pmatrix}$. Show that $A^3 - 6A^2 + 5A + 11I = 0$. Hence, find A^{-1} .

16. If $A = \begin{pmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{pmatrix}$. Verify that $A^3 - 6A^2 + 9A - 4I = 0$ and hence find A^{-1} .

17. Let A be a nonsingular square matrix of order 3×3 . Then $|adj A|$ is equal to:

- (a) $|A|$
- (b) $|A^2|$
- (c) $|A^3|$
- (d) $|3A|$

18. If A is an invertible matrix of order 2, then $\det(A^{-1})$ is equal to:

- (a) $\det(A)$
- (b) $\frac{1}{\det(A)}$
- (c) 1
- (d) 0