

Book Problems:

Section 3.1 # 5, 13, 15

Section 3.2 # 1, 10, 11, 34

For 3.2 #1, you may use any of the methods from class to compute the determinant.

Additional Problems:

1. Let $A = \begin{bmatrix} 2 & 2 & -2 & 1 \\ 0 & 1 & -1 & 0 \\ 6 & 0 & 0 & 7 \\ 0 & 0 & -3 & 0 \end{bmatrix}$. Compute the determinant of A using three different methods.

- (a) The definition of the determinant
 - (b) Reduction to triangular form
 - (c) Cofactor expansion
2. Suppose A and B are 3×3 matrices such that $B^{-1} = \frac{1}{5}A^2$. If $\det(A) = 2$, what is $\det(B)$?
3. Let A be a square matrix. Determine if the following are true or false. Give a proof or counterexample.
- (a) If $AA^T = I$, then $\det(A) = \pm 1$.
 - (b) If $A + A^T = I$, then $\det(A) = \frac{1}{2}$.
4. Let A be a 5×5 matrix with determinant 5.

- (a) What is the RREF of A ?

- (b) Let $\mathbf{b} = \begin{bmatrix} 5 \\ 5 \\ 5 \\ 5 \\ 5 \end{bmatrix}$. How many solutions are there to the linear system $A\mathbf{x} = \mathbf{b}$?