

2270-2, LINEAR ALGEBRA 03/29/05
TRUE OR FALSE PROBLEMS IN CHAPTER 6

Determine whether the following statement is True or False.

All matrices are square matrices unless otherwise stated.

1. $\det(AB) = \det(A)\det(B)$.
2. $\det(A + B) = \det(A) + \det(B)$.
3. $\det(AB) = \det(BA)$.
4. If all the entries of a 7×7 matrix A are 7, then $\det(A)$ must be 7^7 .
5. If the determinant of an 5×5 matrix A is 5, then its rank must be 5.
6. If A is any symmetric matrix, then $\det(A) = 1$ or -1 .
7. If A is any skew-symmetric 4×4 matrix, then $\det(A) = 0$.
8. If A is symmetric and orthogonal, then $\det(A) = 1$ or -1 .
9. If A is any skew-symmetric 5×5 matrix, then $\det(A) = 0$.
10. There exists invertible 3×3 matrix A and S such that $S^{-1}AS = -A$.
11. There exists a 3×3 matrix A such that $A^2 = -I_3$.
12. If an $n \times n$ matrix A is invertible, then $\text{adj}(A)$ is invertible as well.