

Work sheet week 9

fredag 2. mars 2018 12:30

C.1

C.2

Since any row operations in A does not affect the determinant, then you could row reduce A to A' where A' is in the triangular form and the determinant is the product of the diagonal ($A_{11} \cdot A_{22} \cdot \dots \cdot A_{nn}$) then $|r \cdot A| = |r \cdot A'|$.

Multiplying A by r multiplies each of the elements in the diagonal by r which gives:

$$|r \cdot A| = |r \cdot A'| = (rA_{11} \cdot rA_{22} \cdot \dots \cdot rA_{nn}) = r^n (A_{11} \cdot A_{22} \cdot \dots \cdot A_{nn}) = r^n |A|$$

C.3

Since $|A \cdot B| = |A| \cdot |B|$ then $|A^k| = |A \cdot A^{k-1}| = |A| \cdot |A^{k-1}|$ which recusivly implies that $|A^k| = |A|^k$

C.4

$|A|^k = 0 \Rightarrow |A| = 0^k = 0 \Rightarrow A$ is not invertible