

Financial Mathematics

Cayley's Theorem

0036-1. Let $A := \begin{bmatrix} 1 & 2 & -2 \\ 2 & 2 & -4 \\ 3 & -2 & 0 \end{bmatrix}$.

Let $d := \det A$.

Let B be the cofactor matrix of A .

Let I be the 3×3 identity matrix.

- a. Find B .
- b. Find B^t .
- c. Find AB^t .
- d. Find $B^t A$.
- e. Find dI .

0036-2. Let $A := \begin{bmatrix} 1 & 2 & -2 \\ 2 & 2 & -4 \\ 3 & -2 & 0 \end{bmatrix}$.

Let I be the 3×3 identity matrix.

Let $f(\lambda)$ be the characteristic polynomial of A .

Then $f(\lambda) = \det(A - \lambda I) = -\lambda^3 + p\lambda^2 + q\lambda + r$,
for some $p, q, r \in \mathbb{Z}$.

- a. Find p, q, r .
- b. Find A^2 and A^3 .
- c. Find $-A^3 + pA^2 + qA + rI$.