

PRINT Names of group members: _____

Problem 1: For each matrix E_i below calculate $\det(A_i)$, A_i^{-1} , and $\det(A_i^{-1})$.

$$A_1 = \begin{bmatrix} -2 & 0 \\ 3 & 1 \end{bmatrix} \quad A_2 = \begin{bmatrix} 7 & 2 \\ -4 & 1 \end{bmatrix} \quad A_3 = \begin{bmatrix} 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 \end{bmatrix}$$

State and prove a proposition relating the determinant of A and the determinant of A^{-1} .

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Problem 2: For each matrix A_i below calculate $\det(A_i)$, $\det(A_i^T)$.

$$A_1 = \begin{bmatrix} 1 & -5 & 0 \\ 2 & 1 & 0 \\ 4 & 2 & 1 \end{bmatrix} \quad A_2 = \begin{bmatrix} 3 & 2 & 1 & 5 & 3 \\ 0 & 1 & 0 & 2 & -1 \\ 4 & 1 & -2 & 1 & 1 \\ 2 & 0 & 0 & 0 & 2 \\ 0 & 0 & 0 & -2 & 0 \end{bmatrix}$$

Make a conjecture relating the determinant of A and the determinant of A^T .

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Problem 3: Let $A = \begin{bmatrix} 1 & 0 & 5 & 0 & 2 \\ 0 & 1 & 2 & 1 & 2 \\ 0 & 2 & 4 & 1 & 1 \\ 0 & 3 & 6 & 0 & -3 \end{bmatrix}$

Find an orthonormal basis for $C(A)$. Find an orthonormal basis for \mathbb{R}^4 which contains your basis for $C(A)$.

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