Name: **Tutorial day and time:**

Select one *completed* problem for feedback:

1. Let A, B, and C be $n \times n$ matrices such that $\det(A) = 2$, $\det(B) = -1$, and $\det(C) = 3$. Evaluate $\det(A^3BC^TB^{-1})$.

2. If A and B are 3×3 matrices such that $\det(2A^{-1}) = -4 = \det(A^3(B^{-1})^T)$, what are the values of $\det(A)$ and $\det(B)$?

3. The matrix $A = \begin{bmatrix} 3 & 2 & 1 \\ 1 & 4 & 1 \\ 1 & 2 & 3 \end{bmatrix}$ has eigenvalues $\lambda = 2$ and $\lambda = 6$. Find the corresponding eigenvectors.

4. Compute the eigenvalues and eigenvectors of the matrix $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$.

5. Verify that the matrix $Z = \begin{bmatrix} 3 & 1 \\ -2 & 1 \end{bmatrix}$ has eigenvalues $\lambda_{\pm} = 2 \pm i$ with corresponding eigenvectors $\vec{x}_+ = \begin{bmatrix} 1+i \\ -2 \end{bmatrix}$, $\vec{x}_- = \begin{bmatrix} 1 \\ -1-i \end{bmatrix}$.