## WRITTEN HOMEWORK 3

Throughout this assignment, we fix a matrix $A$ by

$$A = [a_1, a_2, a_3] = \begin{bmatrix} 3. & 1. & -1. \\ -2. & 0. & -2. \\ -3. & -3. & 1. \end{bmatrix},$$

while $a_1, a_2, a_3$ are column vectors of $A$.

(1) Find determinant of $A$
(2) Is $A$ invertible? If yes, find its inverse.
(3) Find all possible numbers $c$ such that the vector $\begin{bmatrix} 1 \\ -1 \\ c \end{bmatrix}$ belongs to $span\{a_1, a_2\}$.
(4) Find all eigenvalues.
(5) Find all corresponding eigenvectors with 3 being the first non-zero entry.
(6) Find $A^5$