

- i) (10 Points) Find a row-echelon form of the following matrix. Record the row operations you perform, using the notation of elementary row operations.

$$A = \begin{bmatrix} 1 & 0 & -2 & 0 \\ 1 & 4 & -4 & -1 \\ 1 & 2 & 0 & -2 \\ 0 & 1 & -1 & 0 \end{bmatrix}$$

- ii) (5 Points) Let  $A = \begin{bmatrix} 1 & 2 \\ 2 & 5 \end{bmatrix}$ . Find  $A^{-1}$ , if it exists.

- iii) (10 Points) Let  $A$  be a non-singular  $3 \times 3$  matrix satisfying  $A^3 = 4A^T$ . Find all the possible values of  $\det(A)$ .