1. Consider the matrix $A$ below and its characteristic polynomial $p$.

$$A = \begin{bmatrix} -1 & 1 & -3 \\ -5 & 5 & -3 \\ 0 & 0 & 4 \end{bmatrix}, \quad p(\lambda) = -\lambda(4 - \lambda)^2$$

(a) (2 pts) Find a basis for $\text{Col}(A)$.

(b) (2 pts) Find a basis for $\text{Null}(A)$. 

(c) (1 pt) What are the eigenvalues of $A$?

(d) (3 pts) For each eigenvalue, find a basis of the associated eigenspace.

2. (2 pts) True or False? A square matrix and its reduced row echelon form have the same eigenvalues.