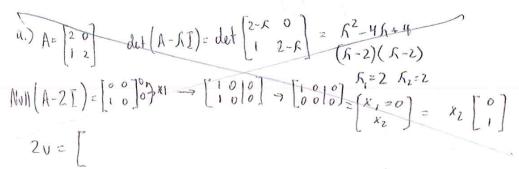
- 5. For each of the statements given below decide if it is true or false. If it is true explain why. If it is false give a counterexample.
- a) If A is a 2 \times 2 matrix and v is an eigenvector of A corresponding to an eigenvalue λ then 2v is an eigenvector of A corresponding to the eigenvalue 2λ. Λεενμρόνα: Corresponding to the eigenvalue 2λ. Λεενμρόνα: Corresponding to the eigenvalue 2λ.

b) If V is a subspace of \mathbb{R}^2 and \mathbf{w} is a vector such that $\operatorname{proj}_V \mathbf{w} = -\mathbf{w}$ then \mathbf{w} must be the zero vector. (2) [2] [9] Z= W-W=0

- c) If A is a square matrix which is both symmetric and orthogonal then A^2 is the identity Assump: take. matrix.
- d) If A and B are 2×2 matrices which are both orthogonally diagonalizable, then the matrix A + B is also orthogonally diagonalizable.



A a) this is felse since for a given Habix about Should with $P = \{v_1, \dots, v_n = v_n\}$ $V_1 = V_n$ are light vectors, and $D = \left[\int_0^\infty \int_0^\infty \int_0^\infty \right]$ Z = W + WWhen the eigenvalues are bound on diagonal Z = W + WWhen the eigenvalues are bound on diagonal Z = W + WCompared to the property of the second of the property o glos solwater P=[v,...v] will where

b.) if projew = -w +3 then where z is orthogonal to V space Z = w - projew

a charge in P of all so why should? C.) The if A is symmetric and outhground

of of [0] = 10 [10] = I Identy In order to have a Orthogonally symmetre Matix Identry the entries on the diagonal Most be 1 . A will result in the