

5. (7 pts) True or False:

- F Any matrix can be diagonalized by a similarity transformation.
- T Any Hermitian matrix can be diagonalized by a unitary transformation.
- T The eigenvectors of a Hermitian matrix can always be chosen to be orthonormal.
- F The eigenvectors of any $N \times N$ matrix always span the N dimensional vector space provided the matrix has determinant $\neq 0$.
- F All unitary matrices are traceless.
- T All antisymmetric matrices are traceless.
- T If a matrix has all its eigenvalues different from zero, it must have an inverse.