QUIZ 9

PRINT YOUR **FULL** NAME: _____

1. (4 points) Decide whether these are true or false.(circle **T/F**)
   - **T/F** The number of (nonzero) singular values of a m $\times$ n matrix is smaller than m and n.
   - **T/F** If A is n$\times$m and P is a n$\times$n orthogonal matrix then A and PA have the same singular values.
   - **T/F** The singular values of a square matrix are equal to its eigenvalues.
   - **T/F** The singular values of a square symmetric matrix A are the square roots of its eigenvalues.
2. (2 points) Orthogonally diagonalize the matrix:

$$\begin{pmatrix} 3 & -1 \\ -1 & 3 \end{pmatrix}$$

3. (3 points) For the following matrix,

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \end{pmatrix}$$

   (1) find all singular values,
   (2) find the SVD.