

QUIZ 9

PRINT YOUR FULL NAME: _____

- (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 points) Orthogonally diagonalize the matrix:

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

- (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.