Math 54 Fall 2017 Sample Quiz 11

You have 20 minutes to complete this quiz. To receive full credit, you must justify your answers.

Name : _____

1. (5 points) Find a least-squares solution of the inconsistent system $A\mathbf{x} = \mathbf{b}$ where

$$A = \begin{bmatrix} 1 & 2 \\ -1 & 4 \\ 1 & 2 \end{bmatrix} \qquad \text{and} \qquad b = \begin{bmatrix} 3 \\ -1 \\ 5 \end{bmatrix}.$$

2. (5 points) Orthogonally diagonalize (Find an orthogonal matrix P and diagonal matrix D so that $A = PDP^{-1}$) the matrix

$$A = \begin{bmatrix} 3 & 1 & 1 \\ 1 & 3 & 1 \\ 1 & 1 & 3 \end{bmatrix}$$

which has eigenvalues $\lambda = 2, 5$.