Name: _____ Section: _____

Math 54 Lec 006 Quiz 8

Friday, July 20, 2018

Justify your assertions; include detailed explanation, and show your work. Closed book exam, no sheet of notes and no calculator. This quiz is worth 9 points total.

1. (3 points) Let $A = \begin{pmatrix} 1 & 2 \\ -1 & 4 \\ 1 & 2 \end{pmatrix}$ and $b = \begin{pmatrix} 3 \\ -1 \\ 5 \end{pmatrix}$. Find the lease square solution to $Ax = b$.

2. (3 points) Let $V = P_2$ and pick three numbers $-2, 0, 2$. Define the inner product on $P_2[t]$ by $\langle p(t), q(t) \rangle = p(-2)q(-2) + p(0)q(0) + p(2)q(2)$. Show that $\{x^2 - 2x, x^2 + 2x, x^2 - 4\}$ is an orthogonal basis of P_2.

3. (3 points) Orthogonally diagonalize the matrix $\begin{pmatrix} 6 & -2 \\ -2 & 9 \end{pmatrix}$