Name: _____   Section: _____
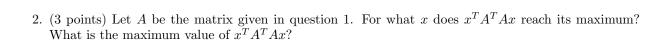
Math 54 Lec 006 Quiz 9

Tuesday, July 24, 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 $A = \begin{pmatrix} 1 & 3 \\ 1 & -1 \\ 1 & 1 \end{pmatrix}$. Orthogonally diagonalize $A^T A$.

2. (3 points) Let A be the matrix given in question 1. For what x does $x^T A^T A x$ reach its maximum? What is the maximum value of $x^T A^T A x$?

3. (3 points) Show that if $v \in \text{Null}(A^T A)$, then $v \in \text{Null}(A)$.