Quiz 10

Name : _____

SID : _____

CAUTION. As you may know, questions are just the same as Sample Quiz. To make any "distribution" of scores, I will be grading more carefully. ***Minor mistakes can cause much deduction of points.*** So, please read each questions carefully and figure out what they want.

1. Let W be the subspace of $\mathbb{R}^3$ spanned by two vectors $\begin{bmatrix}1\\1\\1\end{bmatrix}$ and $\begin{bmatrix}3\\-1\\5\end{bmatrix}$. Find the vector in W which is closest (among vectors in W) to $\begin{bmatrix}-1\\-1\\6\end{bmatrix}$.
   [Hint] You might use *normal equation* method. This is essentially the same question as the question about minimizing $||A\mathbf{x}-\mathbf{b}||$. WHY?

2. Let H be the subspace of $\mathbb{R}^4$ spanned by $\begin{bmatrix}1\\0\\1\\1\end{bmatrix}$, $\begin{bmatrix}6\\1\\-2\\5\end{bmatrix}$, $\begin{bmatrix}0\\8\\2\\1\end{bmatrix}$. Find an orthogonal basis for H.