

Name: \_\_\_\_\_

**Quiz 12**

**Math 2250, Fall 2015**

**December 14, 2015**

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1. Using inner products rather than row reduction, write  $\begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix}$  as a linear combination

of the vectors in the orthogonal basis  $\left\{ \begin{bmatrix} 1 \\ 1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 1 \\ -1 \end{bmatrix} \right\}$ .

2. Find the point of  $W$  closest to  $\begin{bmatrix} 1 \\ 2 \\ 2 \end{bmatrix}$  if  $W$  is the span of the orthogonal set  $\left\{ \begin{bmatrix} 1 \\ 2 \\ 1 \end{bmatrix}, \begin{bmatrix} -1 \\ 1 \\ -1 \end{bmatrix} \right\}$ .