

MATH 54, FALL 2016, QUIZ 9

- (1) Find a solution to the following equation without doing row reduction. (Hint: the columns of the matrix are an orthogonal basis for \mathbb{R}^4 .)

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ 1 & -1 & 1 & -1 \\ 1 & -1 & -1 & 1 \end{bmatrix} \mathbf{x} = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 1 \end{bmatrix}$$

- (2) Find the projection of \mathbf{x} on the subspace V .

$$V = \text{span} \left\{ \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 3 \\ 5 \\ 5 \end{bmatrix} \right\}, \mathbf{x} = \begin{bmatrix} 10 \\ 4 \\ 8 \end{bmatrix}$$