Name: Date: 03/29/2018

M20580 L.A. and D.E. Tutorial
Quiz 7

1. Use the Gram-Schmidt process to find an orthogonal basis for the span of the vectors

$$\mathbf{x}_1 = \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix}, \quad \mathbf{x}_2 = \begin{bmatrix} 1 \\ 0 \\ 0 \\ 1 \end{bmatrix}, \quad \mathbf{x}_3 = \begin{bmatrix} 0 \\ 2 \\ 1 \\ -1 \end{bmatrix}.$$

2. Find the orthogonal projection of $\mathbf{x}_1 = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix}$ onto the line spanned by $\mathbf{x}_2 = \begin{bmatrix} 3 \\ 2 \\ 2 \\ -1 \end{bmatrix}$. Thus, your result should be a multiple of $\mathbf{x}_2$.