Math 1553 Worksheet, Chapter 7

1. True or false (justify your answer!): If u, v, w are vectors in $\mathbf{R}^n$ with $u \perp v$ and $v \perp w$, then $u \perp w$.

2. Let W be the set of all vectors in $\mathbf{R}^3$ of the form $(x, x - y, y)$ where x and y are real numbers.

   a) Find a basis for $W^\perp$.

   b) Find the matrix B for orthogonal projection onto W.

   c) Diagonalize B by finding an invertible matrix C and diagonal matrix D so that $B = CDC^{-1}$.

3. Find, and draw, the best fit line $y = Mx + B$ through the points $(0,0)$, $(1,8)$, $(3,8)$, and $(4,20)$.