

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 $(4, 20)$.