

November 12, 2010

Math 510 Ungraded Homework 12.3

For a nonzero vector $\mathbf{v} \in \mathbb{R}^n$, the Householder reflector defined by \mathbf{v} is

$$H_{\mathbf{v}} = I - 2 \frac{\mathbf{v}\mathbf{v}^T}{\mathbf{v}^T\mathbf{v}}.$$

1. Prove $H_{\mathbf{v}}^T = H_{\mathbf{v}}$.
2. Prove $H_{\mathbf{v}}$ is orthogonal (i.e., unitary and real),