

Assignment 6.

Given Nov 10 2000, due Nov 17 2000.

- (1) Do exercises 17, 18, 20, 21 and 26 from Chapter 8.
- (2) Can a vector space \mathcal{V} be isomorphic to a proper subspace?
- (3) Let $\mathcal{V} = \mathbb{R}^2$ and P the orthogonal projection to $\mathcal{L}(\mathbf{v})$ where \mathbf{v} is a unit vector

$$\mathbf{v} = \begin{pmatrix} 1/\sqrt{5} \\ 2/\sqrt{5} \end{pmatrix}$$

Find the matrix representation for P and verify that

$$P = \mathbf{v}\mathbf{v}^T$$

Can you generalize this result to an arbitrary orthogonal projection in \mathbb{R}^n ?