

Writing Assignment 9: Due Wednesday, November 16

Problem 1: Recall that \mathcal{P}_2 is the vector space of all polynomial functions of degree at most 2. Let

$$W = \{f \in \mathcal{P}_2 : f(1) = 0\},$$

i.e. W is the set of all polynomial functions f of degree at most 2 such that 1 is a root of f .

a. Show that W is a subspace of \mathcal{P}_2 .

b. Give an example, with justification, of a basis of W .

Problem 2: Let V be a vector space, and let $\vec{u}, \vec{w} \in V$. Show that (\vec{u}, \vec{w}) is linearly dependent if and only if either $\vec{u} = \vec{0}$ or $\vec{w} \in \text{Span}(\vec{u})$.