Writing Assignment 9: Due Wednesday, April 24

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 $\vec{w} \in \mathsf{Span}(\vec{u})$.