

Differential Geometry

Homework 2

due on Tuesday, October 3

1. Let $\Phi : \mathbb{P}^2 \rightarrow \mathbb{R}^4$ be the smooth map defined by

$$\Phi([x : y : z]) = \frac{1}{x^2 + y^2 + z^2}(x^2 - z^2, yz, xz, xy).$$

Show that (\mathbb{P}^2, Φ) is an embedded submanifold of \mathbb{R}^4 .

2. Let \mathcal{F} be the Reeb foliation of S^3 and let $\Phi : S^3 \rightarrow N$, with N a smooth manifold, be a continuous map whose restriction to each leaf of \mathcal{F} is constant. Show that Φ is constant.