Writing Assignment 3: Due Wednesday, February 14

Problem 1: Define $f\colon \mathbb{Z} \to \mathbb{Z}^2$ by letting $f(n) = (4n-3, n^4 - n^3 + 7n + 1)$. Show (from the definition) that f is injective.

Problem 2: Define $f\colon \mathbb{R}^2 \to \mathbb{R}$ by letting $f((x,y)) = 2x + \cos y - 9$. Show (from the definition) that f is sujective.

Problem 3: Let $\vec{u}_1, \vec{u}_2 \in \mathbb{R}^2$, and assume that $\vec{u}_2 \in \mathsf{Span}(\vec{u}_1)$. Using a careful double containment proof, show that $\mathsf{Span}(\vec{u}_1, \vec{u}_2) = \mathsf{Span}(\vec{u}_1)$.
Note: This is one direction of Proposition 2.3.8.