1. [**6 points**] Let $f = \{(x, y) \mid x^2 = 1 - y\}$.

   Prove that f is a function.

2. [**6 points**] Let $f = \{(x, y) \mid x^2 = 1 - y^2\}$.

   Prove that f is not a function.

3. [**8 points**] Let $f : \mathbb{R}\backslash\{0\} \to \mathbb{R}\backslash\{1\}$, $f(x) = 1 + \dfrac{1}{x}$.

   (a) Prove that f is one-to-one.

   (b) Prove that f is onto $\mathbb{R}\backslash\{1\}$.