Problem 4. Let $m, n \in \mathbb{N}$, and suppose $X$ is a set with exactly $m$ elements and $Y$ is a set with exactly $n$ elements. If $f : X \to Y$ is an injection, which of the following may be true?

a. $n > m$.

b. $n = m$.

c. $n < m$.

d. There is no way to tell.

Problem 5. Let $m, n \in \mathbb{N}$, and suppose $X$ is a set with exactly $m$ elements and $Y$ is a set with exactly $n$ elements. If $f : X \to Y$ is a surjection, which of the following may be true?

a. $n > m$.

b. $n = m$.

c. $n < m$.

d. There is no way to tell.

Problem 6. For any sets $A$ and $B$, let $A/B$ denote the set $A - B$. Prove that the function $f : \mathbb{R}/\{2\} \to \mathbb{R}$ defined by $f(x) = x/(x - 2)$ is not a bijection. Find a set $Y \subseteq \mathbb{R}$ so that the function $g : \mathbb{R}/\{2\} \to Y$ given by the same formula is a bijection, and find $g^{-1}$. 