Problem 43. Let \( g : [2, \infty) \to [0, \infty) \) be defined by \( g(x) = \sqrt{x - 2} \). Prove that \( g \) is a bijection.

Problem 44. If \( X, Y, Z \) are sets and \( f \subseteq X \times Y, g \subseteq Y \times Z \) are relations, then the composite relation of \( g \) with \( f \) is

\[
g \circ f = \{(x, z) \mid \exists y \in Y \text{ with } (x, y) \in f \text{ and } (y, z) \in g\} \subseteq X \times Z.
\]

Prove that if \( f \) and \( g \) are functions, then so is \( g \circ f \).