

3. Let $f: A \rightarrow B$, $g: B \rightarrow C$. Prove that if f and g are injective, then $h = g \circ f$ is injective.

4. Suppose that A is a denumerable set, and $x \in A$. Show that $A - \{x\}$ is denumerable.

5. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a decreasing function.

a) What can be said about $f \circ f$?

b) Suppose that f is composed with itself n times, and denote the resulting function $\overset{n}{\circ} f(x)$. What can be said about $\overset{n}{\circ} f$?

Extra Credit [2 points possible]: Show that the rational numbers are denumerable.