Name and student number:

1. Define functions $f : \mathbb{R} \to [1, \infty)$ and $g : [1, \infty) \to \mathbb{R}$ by $f(x) = x^2 + 1$ and $g(x) = \sqrt{x - 1}$, respectively.

[2] (a) Compute $f(g(x))$ for $x \geq 1$.

[2] (b) Compute $g(f(x))$ for $x \in \mathbb{R}$.

[1] (c) Is $g = f^{-1}$? Why or why not?

Total: 10 points

2. Construct an example of functions $f : A \to B$ and $g : B \to C$ such that g and $g \circ f$ are onto, but f is not. [3]

3. Let $f : A \to B$ and $g : B \to C$ be functions. Prove that if $g \circ f : A \to C$ is onto, then g onto. [2]

Total: 10 points