Math 2001 - Assignment 14

Due December 7, 2016

(1) Is

$$f \colon \mathbb{Z} \to \mathbb{N}, \ x \mapsto \begin{cases} 2x + 1 & \text{if } x \geq 0 \\ -2x & \text{if } x < 0 \end{cases}$$

bijective? If so, give f^{-1}.

(2) Let $f \colon A \to B$ and $g \colon B \to C$ be injective. Show that $g \circ f$ is injective.

(3) Let A, B be finite sets with $|A| = |B|$, and let $f \colon A \to B$ be surjective. Show that f is bijective.

Is this true for surjective functions between infinite sets as well?