Back to $f(x) = x^2$

- Let $f\colon \mathbb{R} \to \mathbb{R}$ be given by $f(x) = x^2$.
- Note that f is not injective: $f(1) = f(-1)$.
- Not that f is not surjective: there is no x with $f(x) = -3$.

- Now consider $f\colon \mathbb{R}^{\geq 0} \to \mathbb{R}^{\geq 0}$ be given by $f(x) = x^2$.
- f is injective. If $x \neq y$ and $x, y \geq 0$, then $x^2 \neq y^2$.
- f is surjective: for any $y \in \mathbb{R}^{\geq 0}$, $f(\sqrt{y}) = y$.

NOTE!!!

We made the function injective and surjective by **changing the domain and codomain**, not by changing the rule!