# Natural Square Roots

## 1 Why

We want to solve equations with squares.

## 2 Definition

Let $m$ be a square number. We want to find $n$ to satisfy

$$n^2 = m.$$

We call such an $n$ a *square root* of $m$.

**Proposition 1.** *The square root of a square number is unique.*

This result motivates definining a function the *square root function* which square numbers to their roots.

## 3 Notation

Let $S$ denote the set of square numbers. ($S \subset \mathbf{N}$). Let $f : S \to N$ be the function such that $f(s)$ is the square root of $s$. each square number with its root. We denote the result of $f$ on $n$ by $\sqrt{n}$.