



## 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 defining 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  $f : S \rightarrow \mathbf{N}$  be the function such that  $f(s)$  is the square root of  $s$ . We denote the result of  $f$  on  $n$  by  $\sqrt{n}$ .