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 defininining 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 $\sqrt{n}$.