Chapter 1

The Real Numbers

1.1 Discussion: the Irrationality of $\sqrt{2}$

THEOREM 1.1.1. *There is no rational number whose square is 2.*

Proof.

$$x = y + x \tag{1.1}$$

$$f(x) = x^2 \tag{1.2}$$

$$f(x) = \sum_{i=1}^{n} x_i = x_1 + x_2 + \cdots + x_n \tag{1.3}$$

□

1.2 Some Preliminaries