Set Specification

1 Why

We specify a subset of a known set via a property.

2 Definition

TODO: add the axiom

Let A be a nonempty set. We use the notation

$$\{a \in A \mid \text{———}\}$$

to indicate a subset of A that satisfies some property specified after the |. We read the symbol | aloud as "such that." We read the whole notation aloud as "a in A such that..."

We call the notation **set-builder notation**. Set-builder notation avoids enumerating elements.

3 Example

For example, let L be the set of Latin letters and V the set of Latin vowels. A first notation for V is $\{a, e, i, o, u\}$. A second

notation for V is $\{l \in L \mid l \text{ is a vowel}\}$. We may prefer the second, in cases when it saves time. This notation is really indispensable for sets which have many members, too many to reasonably write down.