

Inductive Specification

Exercise 1.1

1. $\{3n + 2 \mid n \in N\}$

Definition (top-down) *A natural number n is in S if and only if*

1. $n = 2$, or

2. $n - 3 \in S$.

Definition (bottom-up) *Define the set S to be the smallest set contained in N and satisfying the following two properties:*

1. $2 \in S$, and

2. if $n \in S$, then $n + 3 \in S$.

Definition (rules of inference)

$$2 \in S$$

$$\frac{n \in S}{n + 3 \in S}$$

We generate some elements of S .

1. $2 \in S$.

2.

$$\frac{1 \in N}{(3 + 2) \in S}$$

3.

$$\frac{2 \in N}{(6 + 2) \in S}$$

2. $\{2n + 3m + 1 \mid n, m \in N\}$

Definition (top-down) *Natural numbers n, m are in S if and only if*

1. $n + m = 1$, or

2. $n -$