

RZ: please edit the provided LyX file next time

Answer to assignment 1

September 24, 2012

Definition: $P(x, y) = \{(x, y) \mid x \in \mathbb{N} \wedge y \in \mathbb{N} \wedge y \geq x\}$

Proof:

For 1: $\forall x \in \mathbb{N}$,

let $y = x + 1$

so $\exists y \in \mathbb{N}, y \geq x$

For 2: $\forall y \in \mathbb{N}$,

let $x = y + 1$

so $\exists x \in \mathbb{N}, y \leq x$. **RZ: this should be $<$, I think, or the next step can not be inferred.**

That is to say, $\neg \exists y \in \mathbb{N}. \forall x \in \mathbb{N}. P(x, y)$,

for the reason $(\neg \exists x. p(x) \Leftrightarrow \forall x. \neg p(x))$.