Phase 8 : Set Comprehension

Example 1 : Set by Predicate

(a)

Basic set comprehension with domain

$$\{\, x : \mathbb{N} \mid x > 0 \,\}$$

(b)

Multi variable set

$$\{\, x, y : \mathbb{N} \mid x = y \,\}$$

(c)

Set without domain

$$\{\, x \mid x \in A \,\}$$

Example 2 : Set by Expression

(a)

Set comprehension with expression part

$$\{\, x : \mathbb{N} \mid x > 0 \bullet x^2 \,\}$$

(b)

Combining set comprehension with quantifier

$$\forall\, x : \mathbb{N} \bullet x \in \{\, y : \mathbb{N} \mid y > 0 \,\}$$

Example 3 : Complex Examples

(a)

Set comprehension in equivalence

$$\{\, x : \mathbb{N} \mid x > 0 \,\} = \{\, y : \mathbb{N} \mid y > 0 \,\}$$

(b)

Set comprehension with multiple conditions

$$\{\, x : \mathbb{N} \mid x > 0 \land x \leq 10 \,\}$$