Phase 7 : Equality land Special Operators

Test 1 : Mu Operator

(a)

$(\mu \, x : \mathbb{N} \mid x^2 = 4 \wedge x > 0)$

(b)

$(\mu \, x \mid x > 0 \wedge x < 10)$

Test 2 : Not Equal Operator

(a)

$x \neq 0$

(b)

$x \neq 0 \wedge y \neq 0$

(c)

$x \neq y \vee y \neq z$

Test 3 : Not In Operator

(a)

$x \notin S$

(b)

$x \in A \wedge x \notin B$

(c)

$x \notin S \Leftrightarrow \neg \, (x \in S)$

Test 4 : One Point Rule

$$\exists \, y : \mathbb{N} \bullet y = 0 \wedge x \neq y$$
$$\Leftrightarrow 0 \in \mathbb{N} \wedge x \neq 0$$
$$\Leftrightarrow x \neq 0$$

Test 5 : Complex Reasoning

(a)

$(\mu \, x : \mathbb{N} \mid x^2 = 9 \wedge x \neq 3)$

(b)

$\forall\, x : \mathbb{N} \bullet \exists\, y : \mathbb{N} \bullet x \neq y$

(c)

$\forall\, x : \mathbb{N} \mid x \in S \bullet x \notin T$

Test 6 : Mixed Operators

(a)

$x = y \vee x \neq y$

(b)

$x \in A \vee x \notin A$

(c)

$(\mu\, x : \mathbb{N} \mid x \in S \wedge x \neq 0 \wedge x^2 < 10)$