

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

$$\begin{aligned} & \exists y : \mathbb{N} \bullet y = 0 \wedge x \neq y \\ & \Leftrightarrow 0 \in \mathbb{N} \wedge x \neq 0 \\ & \Leftrightarrow x \neq 0 \end{aligned}$$

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)

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