Phase 7 : Equality and Special Operators

Test 1 : Mu Operator

(a)

$\mu\, x \colon N \bullet x^2 = 4 \wedge x > 0$

(b)

$\mu\, x \bullet x > 0 \wedge x < 10$

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

$$\exists\, y \colon N \bullet y = 0 \wedge x \neq y$$
$$\Leftrightarrow 0 \in N \wedge x \neq 0$$
$$\Leftrightarrow x \neq 0$$

Test 5 : Complex Reasoning

(a)

$$\mu\, x \colon N \bullet x^2 = 9 \wedge x \neq 3$$

(b)

$$\forall\, x \colon N \bullet \exists\, y \colon N \bullet x \neq y$$

(c)

$$\forall\, x \colon N \bullet x \in S \Rightarrow x \notin T$$

Test 6 : Mixed Operators

(a)

$$x = y \vee x \neq y$$

(b)

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

(c)

$$\mu\, x \colon N \bullet x \in S \wedge x \neq 0 \wedge x^2 < 10$$