laboratorio 4

Gustavo Sosa
William Madrid

20/08/2019

Ejercicio #1

Conjunto 1:

$a := \{1, 2, 4, 8, 16, 32, 64\}$
$d := \{n \in \mathbb{N} \mid \exists i \in \mathbb{N} \; . \; n = 2^i \wedge n < 100\}$

Conjunto 2:

$b := \{n \; \in \mathbb{N} \mid \exists x \in \mathbb{N} \; . \; x = n/5\}$
$f := \{n \in \mathbb{N} \mid \exists x \in \mathbb{N} \; . \; n = x + x + x + x + x\}$

Conjunto 3:

$e := \{n \in \mathbb{N} \mid \exists x \in \mathbb{N} \; . \; x = \sqrt{n}\}$
$c := \{n \in \mathbb{N} \mid \exists x \in \mathbb{N} \; . \; n = x * x\}$

Ejercicio #2

1. $A := \{n \in \mathbb{N} \mid n\%5 = 0\}$
2. $A := \{n \in \mathbb{N} \mid n\%5 = 0 \wedge n\%4 = 0\}$
3. $A := \{n \in \mathbb{N} \mid \nexists X \in \mathbb{N} \; . \; 0 < x < n \mid n\%x = 0\}$
4. $A := \{a \subset P(\mathbb{N}) \mid \exists X \in \mathbb{N} \wedge n \subset a \; . \; x\%15 = 0\}$
5. $A := \{X \subset P(\mathbb{N}) \mid \exists X \in x \wedge n, i \in \mathbb{N} \sum_i^n x = 42\}$

Ejercicio #3

(A,B,C)
$A := \{a \in \mathbb{N} \mid \nexists X \in \mathbb{N} \; . \; 0 < x < a \mid a\%x = 0\}$
$B := \{b \in \mathbb{N} \mid \nexists X \in \mathbb{N} \; . \; 0 < x < b \mid b\%x = 0\}$
$C := \{c \in \mathbb{N} \mid c = a * b \wedge c < 50\}$

Ejercicio #4

1. $A := \{(x, x + x) \mid x \in \mathbb{N}\}$
2. $A := \{(x, True)x \in \mathbb{N} \mid x\%5 = 0\}$
   $B := \{(x, False)x \in \mathbb{N} \mid x\%5 \neq 0\}$
   $C := A \cup B$
3. $g \circ f$
   $\mathbb{N} -> \mathbb{B}$
4. $g \circ f$
   $g \circ f = A \cup B$
   $A := \{(x, 1)x \in \mathbb{N} \mid x\%5 = 0\}$
   $A := \{(x, 0)x \in \mathbb{N} \mid x\%5 \neq 0\}$

Ejercicio #5

1. No es inyectiva, subjetiva o biyectiva
2. No es inyectiva, subjetiva o biyectiva
3. Es biyectiva
4. Es biyectiva

Ejercicio #6

1. $B_1 := \{(a, b)a, b \in \mathbb{N} \mid a > 0 \land a\%2 = 0 \land b > 0\}$
2. $B_2 := \{(a, b)a, b \in \mathbb{N} \mid a > 1 \land a\%2 = 0 \land b > 0\}$
3. $B_3 := \{(a, b)a \in \mathbb{N} \land b \in \mathbb{Z} \mid a > 0 \land a\%2 = 1 \land b < 0\}$
4. $B = \{0, 0\} \cup \{(a, b)a, b \in \mathbb{N} \mid a > 0 \land a\%2 = 0 \land b > 0\} \cup \{(a, b)a \in \mathbb{N} \land b \in \mathbb{Z} \mid a > 0 \land a\%2 = 1 \land b < 0\}$