Tarea No. 6

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March 25, 2018

1 Ejercicio 1.

- *Dado un numero n que pertenece a los numero naturales unitarios y que este sea un n sucesor de cero ($\sigma n(0) = n$).*
- *Y cero (0) el primer numero de los numeros naturales unitarios.*

1.1 Suma de dos numeros naturales:

Caso base:

$$n + 0 = n$$
$$\sigma(n) + m = \sigma(n + m)$$

Caso inductivo:

$$\sigma(\sigma(0) + \sigma(\sigma(0))$$
$$\sigma(\sigma(0) + \sigma(\sigma(0)))$$
$$\sigma(\sigma(0 + \sigma(0))))$$
$$\sigma(\sigma(\sigma(\sigma(0))))$$

De manera que:
$\sigma(n) = a$, $m = b$, $\sigma(n + m) = c$

1.2 Multiplicacion de dos numeros naturales

Caso base:

$$n * 0 = 0$$
$$\sigma(n) * m = \sigma((n) * m) + m$$

Caso inductivo:

$$(\sigma(0) * \sigma(\sigma(0))$$
$$\sigma(0) + \sigma(0) + \sigma(\sigma(0))veces... + \sigma(0)$$
$$\sigma(0) + [\sigma(0) + \sigma(\sigma(0))veces... + \sigma(0)]$$
$$\sigma(0) + [\sigma(0) * (\sigma(0)]$$
$$\sigma(\sigma(0))$$

1.3 Mayor que para numeros naturales

Caso base:

- $\sigma(0) > 0$
- $\sigma(\sigma(n)) > 0$

Caso inductivo:

- $\sigma(\sigma(0) > \sigma(0)$
  $\sigma(0) > 0$

- $\sigma(\sigma(n)) > n$
  $\sigma(\sigma(\sigma(n))) > \sigma(n)$
  $\sigma(\sigma(n)) > n$

2 Ejercicio 2.

2.1 Demostracion 1

$$n + 0 = n:$$
$$\sigma(0) + \sigma(n)$$
$$\sigma(0 + n)$$
$$\sigma(n)$$

2.2 Demostracion 2

$$n + m = m + n:$$
$$\sigma(\sigma((0)) + \sigma(\sigma(\sigma((0))) \text{ o}$$
$$\sigma(\sigma(\sigma((0))) + \sigma(\sigma((0)) =$$
$$\sigma(\sigma(\sigma(0)) + \sigma(0))$$
$$\sigma(\sigma(\sigma(\sigma(0)))))$$

2.3 Demostracion 3

$$n \otimes \sigma(\sigma(0)) = n \otimes n:$$
$$\sigma(n) \otimes \sigma(\sigma(0))$$
$$\sigma(\sigma(0) \otimes n)$$
$$\sigma(n) \otimes \sigma(n)$$