

Homework 8.1
Linguistics 726

one

Signature $\Omega_{Numb} = \{\text{zero, one, +, } \times\}$. Homomorphism h from \mathbb{N} to \mathbb{P} arity.

$$h(x) = \begin{cases} \text{even} & \text{if } x \text{ MOD } 2 = 0, \\ \text{odd} & \text{otherwise} \end{cases}$$

a) $\ker_h = \{\langle x, y \rangle \mid h(x) = h(y)\}$
 that is the set $\{\langle 0, \text{even} \rangle, \langle 1, \text{odd} \rangle, \langle 2, \text{even} \rangle, \dots\}$

b) $Q(x) = \ker_h(x)$

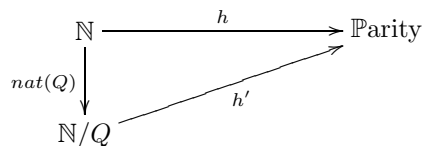
Algebra \mathbb{N}/Q

- zero = even
- one = odd

+	odd	even
odd	even	odd
even	odd	even

×	odd	even
odd	odd	even
even	even	even

c) $h'(\llbracket x \rrbracket) = h(x)$



two

What kind of relation is “is older than”?

“is older than” is a strict partial order. Each two persons a and b are either comparable ($((a > b) \vee (b > a)) \wedge \neg((a > b) \wedge (b > a))$) or incomparable ($\neg((a > b) \vee (b > a))$) with respect to that order.