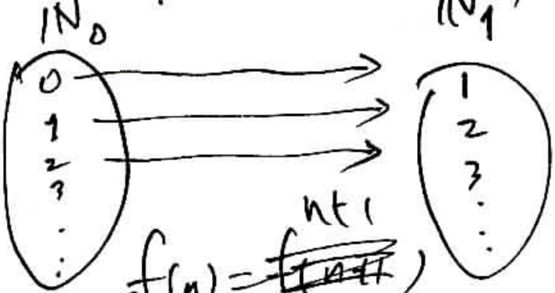
~~8~~4/5 Cardinality of sets



$f(n) = \cancel{f(n+1)}\ n+1$

$f^{-1}(n) = \cancel{\phi}\ n-1$

$\mathbb{N}_1 \subsetneq \mathbb{N}_0$

$|\mathbb{N}_1| = |\mathbb{N}_0|$

If A & B are finite
if $A \subsetneq B$
then $|A| < B$

" infinite
Even if $A \subsetneq B$
$|A| \not< |B|$

positive
Even number
$\{0, 2, 4, 6 \dots\}$ $\{0, 1, 2, 3 \dots\}$

$|\mathbb{N}| = |\mathbb{E}|$
$= |\mathbb{O}|$

$\mathbb{R} = \mathbb{N} \times \mathbb{N}_{\cancel{0}}$
$= \{(i, j) \mid i \in \mathbb{N}, j \in \mathbb{N}\}$

조수열

$((0,0)), ((0,1), (1,0)), ((0,2), (1,1), (2,0)) \dots$

$\dots ((\cancel{0}, k), (1, k-1), \dots (i, j) \dots (0, k))$

in H.S.
$x^0 = 1$ why?
$a^n \cdot a^m = a^{n+m}$
$n, m \geq 1$
$x^0 = 1$, $n, m \geq 0$
$x^{-n} = \frac{1}{x^n}$

$|\mathbb{N} \times \mathbb{N}| = |\mathbb{N}|$

$|\mathbb{N}^k| = |\mathbb{N}|$ $\forall k \in \mathbb{N}_1$
$(\mathbb{N}^k \cong_f \mathbb{N})$

(if $k = 0$
$\mathbb{N}^0 \triangleq \{\emptyset\}$
$\mathbb{N}^0 =$?

3)

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Graph $G=(V, E)$. $E \subseteq V \times V$

$(a,b) \in E$, if $a \to b$.

a binary rel. on V is an edge!..

∴ graph ⇔ relation

~~V^* is~~

$V^* = \bigcup_{i \in \mathbb{N}_0} V^i$

? How to define V^0

$|V^*| = ?$

String : A sequence of characters (unicode)

Cantor's Diagonal Argument.

$A_0 = (\underline{a_{00}}, a_{01}, a_{02}, \cdots$

$A_1 = (a_{10}, \underline{a_{11}}, a_{12}, \cdots$

$\vdots$

$A_n = (a_{n0}, a_{n1}, a_{n2}, \cdots, a_{nn}, \cdots$

$A = (\overline{a_{00}}, \overline{a_{11}}, \cdots, \overline{a_{nn}}, \cdots)$