1.1

Sunday, February 25, 2024 3:47 PM

ΣΥΝΟΛΑ   ΟΡΙΣΜΟΣ 1.1

1) $A = \{-1, +1\}$. $\mathbb{Z} = \{\ldots -1, 0, 1, 2, \ldots\}$.

$T = \{$ΚΟΡΩΝΑ, ΓΡΑΜΜΑΤΑ$\}$

$\{К, Γ\}$

$T_2 = \{ΚΚ, ΓΚ, ΚΓ, ΓΓ\}$

$T_3 = \{ΚΚ, ΓΓ, ΚΓ\} = \{0, 1, 2\}$

2) $\alpha \in A$, $\alpha \notin A$

3) $A \subseteq B$ $\quad \forall x \in A,\ x \in B$

4) $A = B \iff \begin{cases} A \subseteq B \\ B \subseteq A \end{cases}$

5) $A \subset B$ $\quad \begin{cases} A \subseteq B \\ \exists x \in B : x \in A \end{cases}$ $\quad A \neq B$

6) $\emptyset, \{\}$ $\quad \alpha \in \emptyset \quad \forall \alpha$

7) $A \cup B = \{x : x \in A$ Ή $x \in B\}$

$$A_1 \cup A_2 \cup \ldots \cup A_N = \bigcup_{i=1}^{N} A_i$$

$A_1, A_2, \ldots$

$$\bigcup_{i=1}^{\infty} A_i = \{x : \exists i : x \in A_i\}$$

ΠΑΡΑΔΕΙΓΜΑ:

$$\underbrace{\bigcup_{n=1}^{\infty} \left[0, 1 - \frac{1}{n}\right]}_{A} = \underbrace{[0, 1)}_{B}$$

$A \subset B$

$$\underbrace{\bigcap_{m=1} \ldots}_{A} \qquad \underbrace{\ldots}_{B}$$

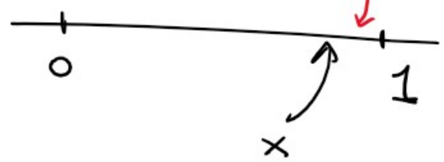
$A \subseteq B$

$x \in A \Rightarrow x \in A_m \Rightarrow$

$$0 \leq x \leq 1 - \frac{1}{m} < 1 \Rightarrow x \in [0, 1)$$

$B \subseteq A$

$$0 \leq x < 1$$



$1 - \frac{1}{m} \rightsquigarrow 1$

$$1 - \frac{1}{n} = x \Leftrightarrow 1 - x = \frac{1}{n} \Leftrightarrow n = \frac{1}{1-x}$$

ΑΚΕΡΑΙΟ ΜΕΡΟΣ

$x \in \mathbb{R}$

$\lfloor x \rfloor \in \mathbb{Z}$: ΜΕΓΙΣΤΟΣ ΑΚΕΡΑΙΟΣ $\leq x$

ΠΑΡΑΔΕΙΓΜΑ

$\lfloor 2.5 \rfloor = 2$

$\lfloor 2 \rfloor = 2$

$\lfloor -1.5 \rfloor = -2$

$\lfloor -2 \rfloor = -2$

$$n = \left\lfloor \frac{1}{1-x} \right\rfloor + 1$$

$$\Rightarrow n \geq \frac{1}{1-x} \Rightarrow \frac{1}{1-\frac{1}{m}} \geq x$$

8) ΤΟΜΗ: A, B $\quad A \cap B = \{x : x \in A$ και $x \in B\}$

$$\bigcap_{i=1}^{m} A_i = A_1 \cap A_2 \cap \ldots \cap A_m \triangleq \{x : x \in A_i \ \forall i = 1, \ldots, m\}$$

$$\bigcap_{i=1}^{\infty} A_i$$

ΠΑΡΑΔΕΙΓΜΑ: $\displaystyle\bigcap_{m=1}^{\infty} \left[0, 1 + \frac{1}{m}\right)$

$[0, 1]$

$[0, 2)$

$[0, 1{,}5)$

$[0, 1{,}33)$

$[0, 1]$

9) Ω ΒΑΣΙΚΟ ΚΑΘΟΛΙΚΟ ΣΥΝΟΛΟ

$\mathbb{R}$ ΜΑΘΗΜΑΤΙΚΑ 1

$\mathbb{R}^n$ ΜΑΘΗΜΑΤΙΚΑ 2

$$\Omega = \{K, \Gamma\}$$

$$\Omega = \{KK, K\Gamma, \Gamma K, \Gamma\Gamma\}$$

$A \subseteq \Omega$ $\qquad A', \; A^c, \; \bar{A} = \{x \in \Omega : x \notin A\}$

VENN

ΛΗΜΜΑ 1.1

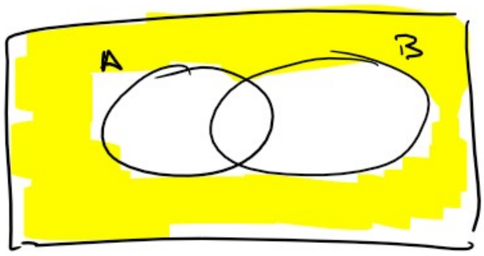
1) $A \cup B = B \cup A$
2) $A \cap B = B \cap A$
3) $A \cup (B \cup C) = (A \cup B) \cup C$
4) $A \cap (B \cap C) = (A \cap B) \cap C$
5) $(A')' = A$
6) $A \cup A' = \Omega$

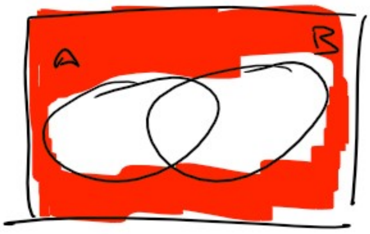
7) $A \cap A' = \emptyset$
8) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
9) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
10) $(A \cup B)' = A' \cap B'$ $\}$ ΝΟΜΟΙ

$a \cdot (b + c) = ab + ac$

$a + b \cdot c \neq (a + b) \cdot (a + c)$

$$
\left.
\begin{array}{ll}
10) & (A \cup B)' = A' \cap B' \\
11) & (A \cap B)' = A' \cup B'
\end{array}
\right\} \text{NOMOI DE MORGAN}
$$





$x \in (A \cup B)' \Rightarrow x \in A' \cap B'$

$x \in A' \cap B' \Rightarrow x \in (A \cup B)'$

$x \in (A \cup B)' \Rightarrow x \notin A \cup B \Rightarrow$

$x \notin A, \ x \notin B \Rightarrow x \in A', \ x \in B'$

$\Rightarrow x \in A' \cap B'$