

## Consultatii

Tuesday, 5 October 2021 11:58

$$\boxed{S.10} \quad \begin{aligned} \mathcal{P} = \{(\alpha, a), \alpha \in \mathbb{R}\} &= \{(\beta, b), \beta \in \mathbb{R}\} \\ \delta = \{(\beta, 3\beta), \beta \in \mathbb{R}\} \end{aligned}$$

$$\mathcal{P} \circ \delta = \mathbb{1}_{\mathbb{R}} \quad \mathbb{1}_{\mathbb{R}} = \{(\alpha, \alpha) \mid \alpha \in \mathbb{R}\}$$

$$S \subseteq C \times D, R \subseteq A \times B$$

$$S \circ R = \{(x, z) \in A \times D \mid \exists y \in B \text{ s.t. } (x, y) \in R \text{ and } (y, z) \in S\}$$

$$\delta \subseteq \mathbb{R} \times \mathbb{R}$$

$$\mathcal{P} \subseteq \mathbb{R} \times \mathbb{R}$$

$$\begin{aligned} \mathcal{P} \circ \delta &= \{(x, z) \in \mathbb{R} \times \mathbb{R} \mid \exists y \in \mathbb{R} \text{ s.t. } (x, y) \in \delta \text{ and } (y, z) \in \mathcal{P}\} \\ &= \{(b, b) \in \mathbb{R} \times \mathbb{R} \mid \exists y = 3b \text{ s.t. } (b, 3b) \in \delta \text{ and } (3b, b) \in \mathcal{P}\} \end{aligned}$$

$$(b, 3b) \quad (3b, b)$$

$$\mathcal{P} \circ \delta = \{(b, b) \mid b \in \mathbb{R}\} = \mathbb{1}_{\mathbb{R}}$$

$$\boxed{S.9} \quad A \Delta B = C$$

$$A = \{a, b, c, d\} \quad B = \{b, d, e\}$$

$$\begin{aligned} A \Delta B &= (A \setminus B) \cup (B \setminus A) \\ &= \{a, c\} \cup \{e\} = \{a, c, e\} = C \end{aligned}$$

$$C = \{a, c, e\}$$

$$A \Delta C = (A \setminus C) \cup (C \setminus A) = \{b, d\} \cup \{e\} = \{b, d, e\}$$

$$\underline{A \Delta C = B}$$

$$\underline{x = c}$$

$$\boxed{S.14} \quad f(x, R) = \{f: X \rightarrow R\}$$

$$f \leq g \Leftrightarrow f(x) \leq g(x), \forall x \in X$$

$f(x, R)$ ,  $\leq$  multime ordonata

" $\leq$ " rel de ordine

$$(R) f \leq f' \quad \forall f \in f(x, R)$$

$$f \leq f' \Leftrightarrow f(x) \leq f'(x), \forall x \in X \quad (A)$$

$$(AS) \quad f \leq g \wedge g \leq f \Rightarrow f = g \quad \forall f, g \in f(x, R)$$

$$\text{Fie } f, g \in f(x, g)$$

$$\begin{aligned} \cdot f \leq g &\Leftrightarrow f(x) \leq g(x), \forall x \in X \quad (1) \\ \cdot g \leq f &\Leftrightarrow g(x) \leq f(x), \forall x \in X \quad (2) \end{aligned} \quad \left. \begin{array}{l} \Rightarrow f(x) = g(x) \\ \forall x \in X \end{array} \right\} \quad \text{rel de ordine}$$

$$(T) \quad f \leq g \wedge g \leq h \Rightarrow f \leq h \quad \forall f, g, h \in f(x, R)$$

$$f \leq g \Leftrightarrow f(x) \leq g(x), \forall x \in X \quad (1)$$

$$g \leq h \Leftrightarrow g(x) \leq h(x), \forall x \in X \quad (2)$$

$$\text{Arat ca } f \leq h \Leftrightarrow \underbrace{f(x) \leq h(x)}_{\text{din (1) + (2)}} \quad \forall x \in X$$

$$\begin{array}{l} a \leq b \\ b \leq c \end{array} \Rightarrow a \leq c$$

" $\sim$ " rel de echivalenta

" $\sim$ " (R)

$$A \sim A \text{ daca } \exists f: A \rightarrow A \text{ bijectiva}$$

$$1_A = f \quad : \quad 1_A: A \rightarrow A$$

$$1_A(x) = x, \forall x \in A$$

$$\text{Arat ca } 1_A \text{ este bijectiva}$$

$$1_A(x) = x$$

$\otimes \otimes$   $1_A$  surj

$$\otimes + \otimes \Rightarrow 1_A \text{ bijectiva}$$

$$A \sim A \Rightarrow \exists 1_A: A \rightarrow A \text{ bijectiva}$$

$$(S) \quad A, B \text{ multimi} \quad A \sim B \Rightarrow B \sim A$$

$$A \sim B \Rightarrow \exists f: A \rightarrow B \text{ bijectiva} \Rightarrow f \text{ inversabila}$$

$$\Rightarrow \exists f^{-1}: B \rightarrow A \text{ bijectiva} \Rightarrow B \sim A$$

$\Rightarrow \sim$  simetrica

$$(T) \quad A, B, C \in \mathcal{P}(X)$$

$$\text{Daca } (A \sim B) \wedge (B \sim C) \Rightarrow A \sim C$$

$$\text{Fie } A, B, C.$$

$$A \sim B \Rightarrow \exists f: A \rightarrow B \text{ bijectiva}$$

$$B \sim C \Rightarrow \exists g: B \rightarrow C \text{ bijectiva}$$

$$\text{Arat ca } A \sim C \Rightarrow \exists h: A \rightarrow C \text{ bijectiva}$$

$$\text{Fie } f: A \rightarrow B \text{ si } g: B \rightarrow C \text{ bijective}$$

$$\begin{array}{c} f \circ g: A \rightarrow C \\ \text{Fie } x \in A \end{array} \quad \begin{array}{l} f(g(x)) = h(x) \\ \text{arca } h \text{ este bijectiva} \end{array}$$

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