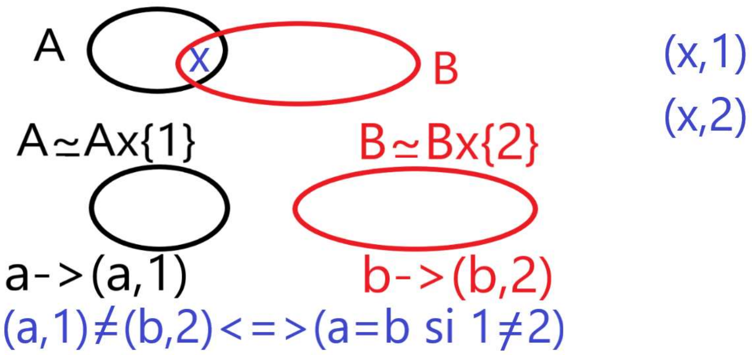
A ∩ (B U C) = (A ∩ B) U (A ∩ C)

p si (q sau r) <=> (p si q) sau (p si r)

(a,b) = {a, {a,b}}

(a1,a2) = (b1,b2) <=> (a1=b1 si a2=b2)



$id_A : A \to A, (\forall a \in A)(id_A(a)=a)$

$A \times (B \times C) \to (A \times B) \times C = id_{A\times B\times C}$

(a,(b,c)) -> ((a,b),c)

(a,b,c):=(a,(b,c)), (a,b,c):=((a,b),c)

(a,(b,c))=(a,b,c)=((a,b),c)

A x B x C := A x (B x C)

A x B x C := (A x B) x C

A x (B x C) = A x B x C = (A x B) x C

$A_1 x A_2 x \ldots x A_n x A_{n+1} := (A_1 x A_2 x \ldots x A_n) \times A_{n+1}$

f : A->B

f=(A,G,B), G<=AxB, …

f=G={(a,f(a)) | aϵA}<=AxB

$A=\{a_1,\ldots,a_n\}$, $B=\{b_1,\ldots,b_k\}$, f:A->B

$f(a_1),\ldots,f(a_n) \in \{b_1,\ldots,b_k\}$, asadar:

$(f(a_1),f(a_2),\ldots,f(a_n)) \in \{b_1,\ldots,b_k\}x\{b_1,\ldots,b_k\}x\ldots x\{b_1,\ldots,b_k\}$, deci:

$|\{f \mid f:A\text{->}B\}|=k*k*\ldots*k=k^n=|B|^{|A|}$

$$\begin{tikzcd} A \arrow[r, "f"] & B \arrow[r, "g"] & C \\ a \arrow[rr, bend right, "gof"'] & f(a) & g(f(a)) \end{tikzcd}$$

$$(gof)(a)=g(f(a))$$

$f(a)=b \Leftrightarrow f^{-1}(b)=a$

$f=(A,G,B) \Rightarrow f^{-1}=(B,\{(b,a) \mid (a,b)\in G\},A)$

$f=G \Rightarrow G^{-1}=\{(b,a) \mid (a,b)\in G\}=f^{-1}$

$R \subseteq AxB$

$R^{-1} = \{(b,a) \mid a\in A, b\in B, (a,b)\in R\} \subseteq BxA$

Pt. orice $a\in A$, $b\in B$: $aRb \Leftrightarrow bR^{-1}a$

$(R^{-1})^{-1}\subseteq AxB \supseteq R$

Pt.orice $a\in A$, $b\in B$: $a(R^{-1})^{-1}b \Leftrightarrow bR^{-1}a \Leftrightarrow aRb$, asadar $R=(R^{-1})^{-1}$

$(a,b)\in AxB \Leftrightarrow (a\in A$ si $b\in B)$

$(a1,\ldots,an)\in A1x\ldots xAn \Leftrightarrow (a1\in A1$ si… si $an\in An)$

$(a,b)\in AxBxC$

$(a\in AxB$ si $b\in C)$ sau $(a\in A$ si $b\in BxC)$ sau…?

$f \subseteq AxB$

$$(\forall a \in A)\,(\exists!\, b \in B)\,((a, b) \in G).$$

$$(\forall b \in B)\,(\exists!\, a \in A)\,(f(a) = b))$$

$a\leq b \Leftrightarrow (a,b) \in \leq$

$R \subseteq A \times B$

R functionala (functie partiala de la A la B) $\Leftrightarrow$

$(\forall\ a \in A)(\exists$ cel mult un $b \in B)(aRb) \Leftrightarrow$

$(\forall a \in A)(\exists$ cel mult un $b \in B)(bR^{-1}a) \Leftrightarrow R^{-1}$ injectiva

<u>Notatie</u> pentru R: functie partiala de la A la B: $R : A \overset{\circ}{\to} B$

$\exists$ cel mult un $b \in B$ inseamna unicitate fara existenta, adica:

$(\forall a \in A)(\exists$ cel mult un $b \in B)(bR^{-1}a) \Leftrightarrow$

$(\forall a \in A)\ (\forall b \in B)\ (\forall c \in B)\ [(bR^{-1}a$ si $cR^{-1}a) \Rightarrow b=c]$

R totala (de la A la B) $\Leftrightarrow$

$(\forall a \in A)(\exists\ b \in B)(aRb) \Leftrightarrow$

$(\forall\ a \in A)(\exists\ b \in B)(bR^{-1}a) \Leftrightarrow R^{-1}$ surjectiva

$R:A \to B \Leftrightarrow$ R functionala si totala

R^{-1} functionala $\Leftrightarrow R=(R^{-1})^{-1}$ injectiva

R^{-1} totala $\Leftrightarrow R=(R^{-1})^{-1}$ surjectiva

$B^A=\{f \mid f:A \to B\}$