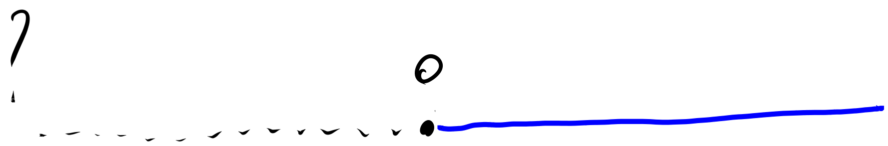
P_1: $\forall x \in \mathbb{R} \quad x^2 > 0$ **falso**

perché $\exists x = 0 \in \mathbb{R}$ tale che $\neg(x^2 > 0)$

Come si traduce $\neg(x^2 > 0)$?



si traduce in $x^2 \leq 0$

$\exists x = 0 \in \mathbb{R}$ tale che $x^2 \leq 0$ (infatti $0^2 \leq 0$).

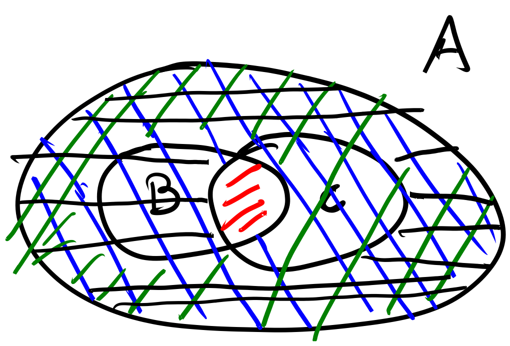
Scrivere la negazione

$\neg P_1$: $\exists x \in \mathbb{R}$ tale che $x^2 \leq 0$ $\rightarrow$ negazione di P_1.

vera.

A insieme, B, C sottoinsiemi di A.

$C_A(B \cap C) = C_A(B) \cup C_A(C)$ $C_A(B \cup C) = C_A(B) \cap C_A(C)$



$$\complement_A(B\cap C) = \complement_A(B)\cup\complement_A(C)$$

$x\in\complement_A(B\cap C) \Rightarrow x\in \complement_A(B)\cup\complement_A(C)$ cioè $\complement_A(B\cap C)\subset \complement_A(B)\cup\complement_A(C)$

$x\in \complement_A(B)\cup\complement_A(C)\Rightarrow x\in\complement_A(B\cap C)$ cioè $\complement_A(B)\cup\complement_A(C)\subset\complement_A(B\cap C)$.

$$x\in\complement_A(B\cap C) \Leftrightarrow x\in \complement_A(B)\cup\complement_A(C)$$

$$x\in\complement_A(B\cap C)\Leftrightarrow (x\in A)\wedge(x\notin B\cap C)\Leftrightarrow (x\in A)\wedge\neg(x\in B\cap C)\Leftrightarrow$$

$$\Leftrightarrow (x\in A)\wedge\neg(x\in B \wedge x\in C)\Leftrightarrow (x\in A)\wedge(\neg(x\in B)\vee\neg(x\in C))$$

$$\Leftrightarrow (x\in A)\wedge((x\notin B)\vee(x\notin C))\Leftrightarrow$$

$$\Leftrightarrow (x\in A \wedge x\notin B)\vee(x\in A \wedge x\notin C)\Leftrightarrow$$

$$\Leftrightarrow x\in\complement_A(B)\vee x\in\complement_A(C)\Leftrightarrow x\in\complement_A(B)\cup\complement_A(C).$$

$X\cup Y=\{x : x\in X \vee x\in Y\}$ per def.

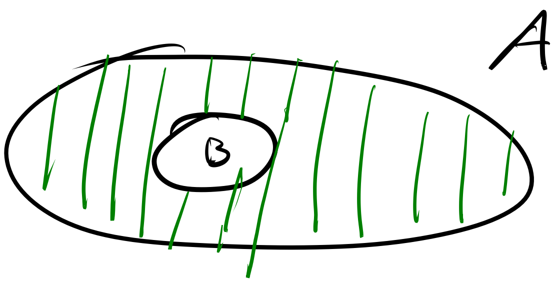
$p\vee(q\wedge r)\longleftrightarrow(p\wedge q)\wedge r$

p	q	r	$q\wedge r$	$\overbrace{p\vee(q\wedge r)}^{A}$	$p\wedge q$	$\overbrace{(p\wedge q)\wedge r}^{B}$	$A\longleftrightarrow B$
1	1	1	1	1	1	1	1
1	1	0	0	1	1	0	0
1	0	1	0	1	0	0	0
0	1	1	1	1	0	0	0
1	0	0	0	1	0	0	0
0	1	0	0	0	0	0	0
0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0

Def. A insieme, $B\subset A$

$$\complement_A(B)=\{x\in A \;:\; x\notin B\}$$

$$x\in\complement_A(B)\Longleftrightarrow x\in A \wedge x\notin B$$



$\complement_{\mathbb{Z}}(\mathbb{N})$ è l'insieme dei numeri interi negativi

$$\left(0\in\mathbb{N}\Rightarrow 0\notin\complement_{\mathbb{Z}}(\mathbb{N})\right)$$

A, B insiemi

$A \times B$ è l'insieme di tutte le possibili coppie ordinate la cui prima coordinata è un elemento di A, la cui seconda coordinata è un elemento di B

$$A \times B = \{(a, b) : a \in A \wedge b \in B\}.$$