

1^a LEGGE

LEZIONE 6
LEGGI DI DE MORGAN

$$\{1,2\} \cap \{2,3\} = \{2\}$$

$$V = \emptyset$$

$$\overline{(A \cap B)} = \bar{A} \cup \bar{B}$$

$$\text{se } x \in \overline{A \cap B} \Rightarrow x \notin A \cap B \Rightarrow \boxed{x \notin A, x \notin B \text{ (CONTINGENZA)}}$$

Ciò non vuol dire che possa succedere:

$$\begin{array}{l} \{x \notin A \} \cup \{x \in A\} \\ \{x \in B\} \cup \{x \notin B\} \end{array}$$

$$x \in \bar{A} \vee x \in \bar{B} \Rightarrow x \in \bar{A} \cup \bar{B}$$

COME VOLEVASI DIMOSTRARE C.V.D.

$$A = \{2, 4, 8, 10\}$$

$$B = \{4, 8\}$$

$$U = A \cup B = \{2, 4, 8, 10\} = A$$

$$\overline{(A \cap B)} = \bar{A} \cup \bar{B}$$

$$A \cap B = \{4, 8\}$$

$$\overline{A \cap B} = \{2, 6, 10\}$$



$$\bar{A} = \{\emptyset\} \quad \bar{B} = \{2, 6, 10\}$$

Ho verificato in questo caso che la prima legge di De Morgan funziona!!!

$$\bar{A} \cup \bar{B} = \{2, 6, 10\}$$

$$\overline{A \cap B} = \bar{A} \cup \bar{B}$$

2^a LEGGE

$$\overline{A \cup B} = \bar{A} \cap \bar{B}$$

$$\text{SE } x \in \overline{A \cup B} \Rightarrow x \notin A \cup B \Rightarrow$$

C.V.d

$$\begin{array}{ccc} & \uparrow & \\ x \notin A & \wedge & x \notin B \\ \Downarrow & & \Downarrow \\ x \in \bar{A} & \wedge & x \in \bar{B} \\ \Downarrow & & \Downarrow \\ x \in \bar{A} \cap \bar{B} \end{array}$$

$$A = \{2, 4, 6, 8, 10\} \quad B = \{4, 6\} \quad U = \{2, 4, 6, 8, 10\}$$

$$\overline{A \cup B} = \overline{A} \cap \overline{B}$$

$$A \cup B = \{2, 4, 6, 8, 10\} \Rightarrow \overline{A \cup B} = \emptyset$$

$$\overline{A} = \emptyset \quad \overline{B} = \{2, 6, 8, 10\}$$

$$\overline{A} \cap \overline{B} = \emptyset \cap \{2, 6, 8, 10\} = \emptyset$$

$$\overline{A \cup B} = \overline{A} \cap \overline{B}$$

Ho verificato che in questo caso la seconda legge di De Morgan funziona

ESERCIZIO

$$A = \{6, 12, 24\} \quad B = \{6, 18, 24\} \quad C = \{12, 24, 48\}$$

1) $A \cup (B \cap C) = A$

$$B \cap C = \{24\}$$

$$A \cup \{24\} = \{6, 12, 24\} \cup \{24\} = \{6, 12, 24\} = A$$

2) $B \cap (A \cup C) = \{24\}$

$$A \cup C = \{6, 12, 24, 48\}$$

$$\{6, 18, 24\} \cap \{6, 12, 24, 48\} = \{6, 24\} = \begin{matrix} A \setminus \{12\} \\ B \setminus \{18\} \end{matrix}$$

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

$$\{6, 18, 24\} \cap \{12, 24, 48\} = \{24\}$$

$$\{24\} \cup \{6, 12, 24\} = \{6, 12, 24\} = A$$