Provas Algébricas

Demonstre que $\overline{A \cap B} = \bar{A} \cap \bar{E}$

$\overline{A \cap B} = \{x \in \mathcal{U} : x \notin A \cap B\}$

$\{x \in \mathcal{U} : \neg(x \in A \cap B\}$

$\{x \in \mathcal{U} :$

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$\{x \in \mathcal{U} :$

$\{x \in \mathcal{U} : x \notin A \lor x \notin B$

$\{x \in \mathcal{U} : x \in \bar{A} \lor x \in \bar{B}$

$\{x \in \mathcal{U} : x \in \bar{A} \cup \bar{B}$

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

Apresente que $A \cap (\bar{B} \cap \bar{C}) \subseteq A \cap (\bar{B} \cup C)$

PIV(13)

$\bar{B} \cap \bar{C} \subseteq \bar{B}$ e $\underline{\bar{B} \cap \bar{C} \subseteq \bar{C}}$

X

$B \subseteq \bar{B} \cup C$ e $\underline{C \subseteq \bar{B} \cup C}$ PIV(14)

X

$\bar{B} \cap \bar{C} \subseteq \bar{B} \subseteq \bar{B} \cup C$ transitividade

$\bar{B} \cap \bar{C} \subseteq \bar{B} \cup C$

A	B	$A \cap B$	$\overline{A \cap B}$	$\bar{A}$	$\bar{B}$	$\bar{A} \cup \bar{B}$	$\overline{A \cap B} \leftrightarrow \bar{A} \cap \bar{B}$
1	1	1	0	0	0	0	V
1	0	0	0	0	1	1	V
0	1	0	0	1	0	1	V
0	0	0	1	1	1	1	V

Tautológia

Apresente uma prova Algébrica de que $\overline{A \cup (B \cap C)} = \bar{A} \cap \overline{(B \cap C)}$ PIV(8)

$= \bar{A} \cap (\bar{B} \cup \bar{C})$ PIV(8)

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

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

Apresente uma prova Algébrica de que $(A - B) - C = A \cap (\bar{B} \cap \bar{C})$

$= (A - B) \cap \bar{C}$ PIV(16)

$= (A \cap B) \cap \bar{C}$ PIV(16)

$= A \cap (\bar{B} \cap \bar{C})$ PIV(1)

Apresente uma prova Algébrica de que $A - (B - C) = A \cap (\bar{B} \cup C)$

$A - (B \cap \bar{C})$ PIV(16)

$A \cap \overline{(B \cap \bar{C})}$ PIV(16)

$A \cap (\bar{B} \cup \bar{\bar{C}})$ PIV(8)

$A \cap (\bar{B} \cup C)$ PIV(7)

PIV = Propriedade Intuitivamente Válidas

1. $A = A \cap \mathcal{U}$ PIV(4)

$A \cap (B \cup \overline{B})$ PIV(10)

$(A \cap B) \cup (A \cap \overline{B})$ PIV(6)

2. $A - B = A \cap \overline{B}$ PIV(16)

$\subseteq A$ PIV(13)

3. $(A - B) \cap B = (A \cap \overline{B}) \cap B$ PIV(16)

$= A \cap (\overline{B} \cap B)$ PIV(7)

$= A \cap \emptyset$ PIV(10)

$= \emptyset$ PIV(5)

4. $(A \cup B) \cap \overline{A} = (A \cap \overline{A}) \cup (B \cap \overline{A})$ PIV(6)

$= \emptyset \cup (B \cap \overline{A})$ PIV(10)

$= B \cap \overline{A}$ PIV(4)

5. $(A \cup B) \cap \overline{B} = (A \cap \overline{B}) \cup (B \cap \overline{B})$ PIV(6)

$= (A \cap \overline{B}) \cup \emptyset$ PIV(10)

$= A \cap \overline{B}$ PIV(4)