1-

P	Q	¬Q	P ⇒ Q	¬(P ⇒ Q)	(P ∧ ¬Q)	rés.
V	V	F	V	F	F	V
V	F	V	F	V	V	V
F	V	F	V	F	F	V
F	F	V	V	F	F	V

tout.

P	Q	P ⇒ Q	(P ⇒ Q) ⇒ Q
V	V	V	V
V	F	F	V
F	V	V	V
F	F	V	F

ni cont. ni tout.

P	¬P	P ⇔ ¬P
V	F	F
V	F	F
F	V	F
F	V	F

Cont.

(P ⇔ ¬P)

P	¬P	P ⇔ ¬P
V	F	F
V	F	F
F	V	F
F	V	F

Cont.

(P ⇔ ¬P) ⇒ (Q ∧ ¬Q)

Q	¬Q	P	¬P	(P ⇔ ¬P)	Q ∧ ¬Q	(P ⇔ ¬P) ⇔ (Q ∧ ¬Q)
V	F	V	F	F	F	V
F	V	V	F	F	F	V
V	F	F	V	F	F	V
F	V	F	V	F	F	V

tout.

2 - $\exists x \ \forall y \quad x > y^2 \Rightarrow x^2 > y^2$

$\forall x \ \exists y \quad x > y^2 \Rightarrow x^2 \leq y^2$

3 -

$8 \leq x < 9,5$

V F
$A \Rightarrow B \rightarrow$ P.F.

F F
$A \Rightarrow B \rightarrow$ P.V.

$\exists x \ A(x) \wedge B(x) \rightarrow$ P.F.

IV - $A = \{1, 3, \{(1,3)\}, \{2\}\} \cup \mathbb{Z}$

$A \subseteq \mathbb{Z} \rightarrow$ F

$A \cap \mathbb{Z} = \mathbb{Z} \rightarrow$ V

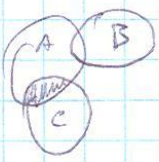
$(1,3) \in A \rightarrow$ F

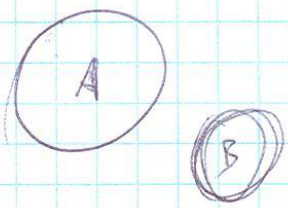
$\{1,3\} \in A \rightarrow$ V

$\{1,2\} \subseteq A \rightarrow$ F

V $A \cap B \cap C = \emptyset$

1. $\forall x \in A \ x \in B \Rightarrow x \notin C \rightarrow$ V
2. $\forall x \in A \ x \notin B \Rightarrow x \in C \rightarrow$ F
3. $A \cap C = A \setminus B \rightarrow$ F
4. $A \cap B \subseteq A \setminus C \rightarrow$ V





VI

$$A = \{ X \subseteq \mathbb{R} \mid \exists x, y \in \mathbb{N} \quad X = \{x, y\} \}$$

$$B = \{ x \in \mathbb{N} \mid 1 \leq x^2 \leq 3 \}$$

$A = \{1, 1\}$

a) $B = \{1, 2, 3\}$

b) $\mathcal{P}(B) = \{ \emptyset, \{1\}, \{2\}, \{3\}, \{1, 2\}, \{2, 3\}, \{1, 3\}, \{1, 2, 3\} \}$

c) $A \cap \mathcal{P}(B) = \{ \{1, 2\}, \{2, 3\}, \{1, 3\} \}$

d) $\mathcal{P}(A) \cap \mathcal{P}(B) = \{ \emptyset, \{1, 2\}, \{2, 3\}, \{1, 3\} \}$

VII

$\forall A, B \quad A \times B = B \times A \rightarrow F$

$\forall A, B \quad A \times B \neq B \times A \rightarrow F$

$\forall A, B \quad (A \times A) \setminus (B \times B) = (A \setminus B) \times (A \setminus B) \rightarrow F$

$\exists A, B \quad (A \times A) \setminus (B \times B) = (A \setminus B) \times (A \setminus B) \rightarrow V$

VIII

$(P \vee Q) \Rightarrow R$

P	Q	R	$P \vee Q$	$P \vee Q \Rightarrow R$
V	V	V	V	V
V	V	F	V	F
V	F	V	V	V
V	F	F	V	F
F	V	V	V	V
F	V	F	V	F
F	F	V	F	V
F	F	F	F	V

É logicamente equivalente

$(P \Rightarrow R) \wedge (Q \Rightarrow R)$

P	Q	R	$P \Rightarrow R$	$Q \Rightarrow R$	$P \Rightarrow R \wedge Q \Rightarrow R$
V	V	V	V	V	V
V	V	F	F	F	F
V	F	V	V	V	V
V	F	F	F	V	F
F	V	V	V	V	V
F	V	F	V	F	F
F	F	V	V	V	V
F	F	F	V	V	V

IX

$A \cup B = A \cap B \Rightarrow$

$\Rightarrow x \in (A \cup B) = x \in (A \cap B)$

$\Rightarrow x \in A \vee x \in B = x \in A \wedge x \in B$

$\Rightarrow (x \in A \wedge x \in A) = (x \in B \wedge x \in B)$

$\Rightarrow x \in A = x \in B \Rightarrow A = B$

X

$A \setminus (B \cap C) \Rightarrow x \in A \wedge x \notin (B \cap C) \Rightarrow$

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

$\Rightarrow (x \in A \wedge x \in B) \vee (x \in A \wedge x \in C) \Rightarrow x \in (A \cap B) \vee x \in (A \cap C) \Rightarrow$

$\Rightarrow A \cap B \cup A \cap C$