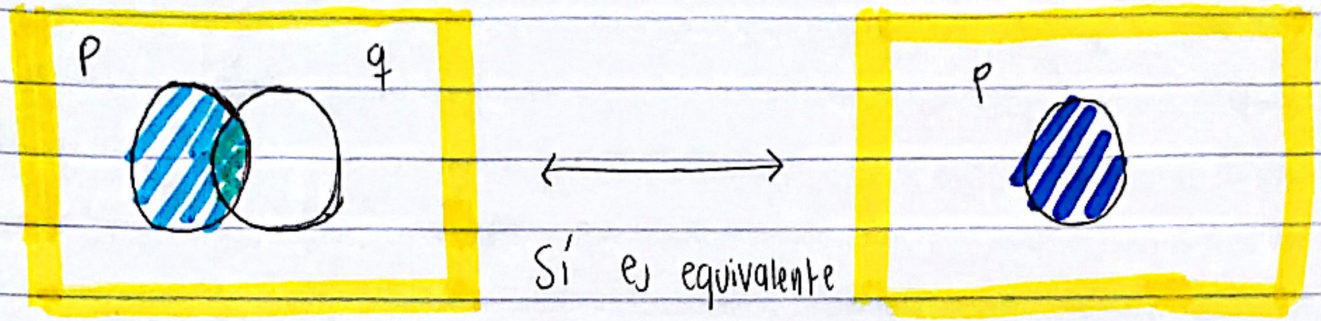
TAREA LEVEL LOGICA

① Haciendo uso de diagramas de Venn demuestre la veracidad o falsedad de las siguientes expresiones logicas

[Absorción]

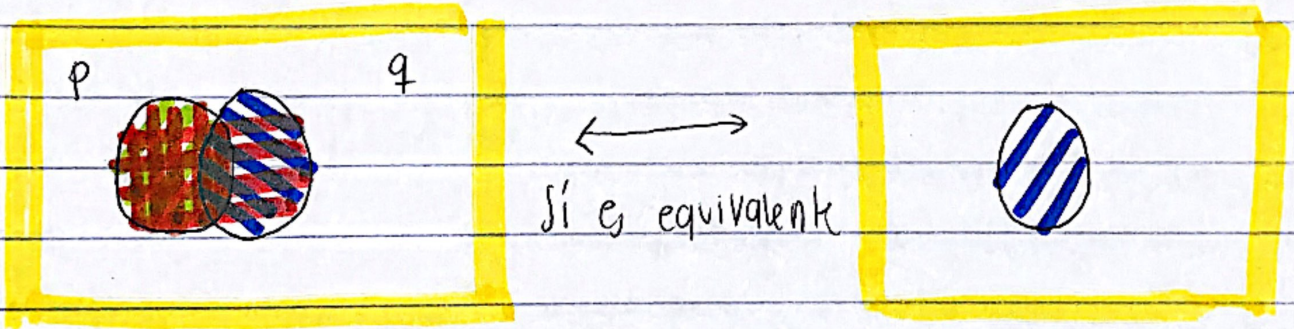


$(p \wedge q)$

$p \vee (p \wedge q)$

$p \vee (p \wedge q) \leftrightarrow p$

p



p

q

$(p \vee q)$

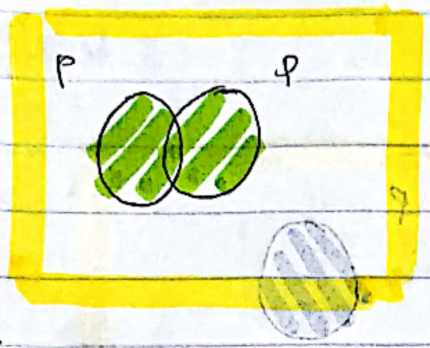
$p \wedge (p \vee q)$

$p \wedge (p \vee q) \leftrightarrow p$

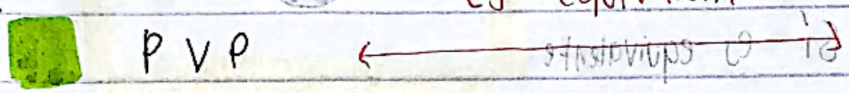
p

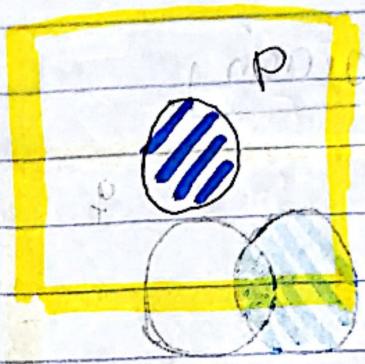
Idempotencia

① $P \vee P \leftrightarrow P$ ES VERAPERA

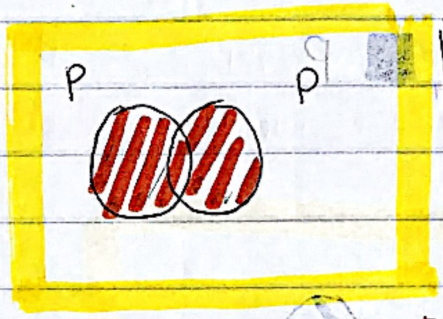


Es equivalente

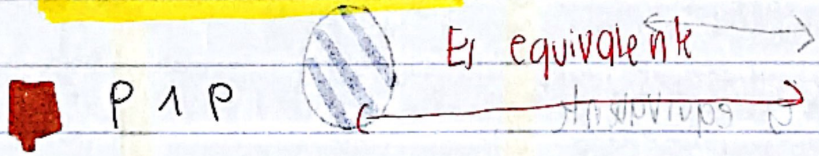


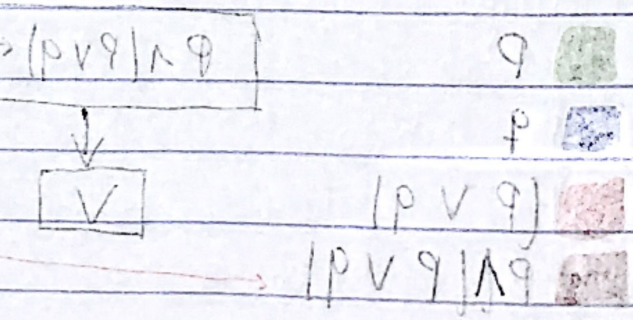


② $P \wedge P \leftrightarrow P$ Es verdadero



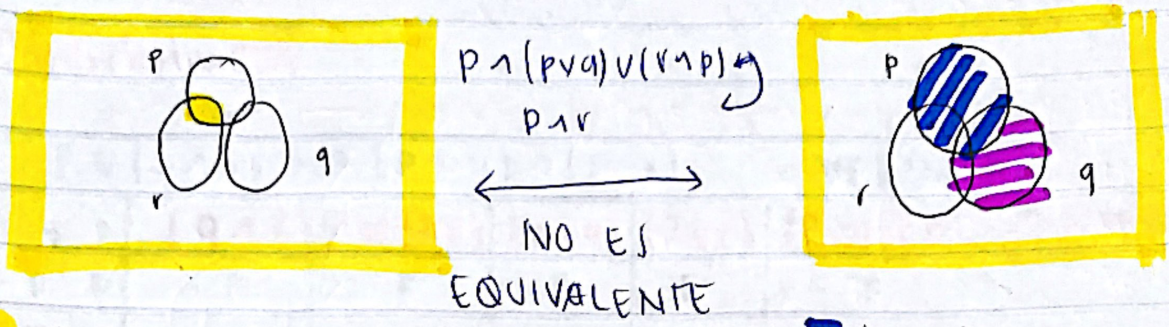
Es equivalente





Idempotencia

③

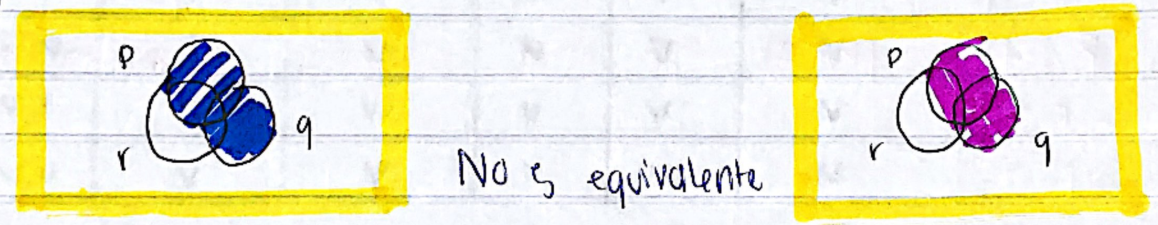


p∧r

(r∧p)

p∧(p∨q)

④



p∨q∧r

p∨(p∨q)∨(r∧q)

(p∨(p∨q)∨(r∧q) ↔ p∨q∧r)

② Haciendo uso de tablas de verdad demuestra la veracidad de las siguientes expresiones logicas

Distributividad

① $P \vee (q \wedge r) \leftrightarrow (P \vee q) \wedge (P \vee r)$ VERDADERO

P	q	r	$(q \wedge r)$	$P \vee (q \wedge r)$	$(P \vee q)$	$(P \vee r)$	$(P \vee q) \wedge (P \vee r)$	$P \vee (q \wedge r) \leftrightarrow (P \vee q) \wedge (P \vee r)$
F	F	F	F	F	F	F	F	V
F	F	V	F	F	F	V	F	V
F	V	F	F	F	F	F	F	V
F	V	V	V	V	V	V	V	V
V	F	F	F	V	V	V	V	V
V	F	V	F	V	V	V	V	V
V	V	F	F	V	V	V	V	V
V	V	V	V	V	V	V	V	V

② $P \wedge (q \vee r) \leftrightarrow (P \wedge q) \vee (P \wedge r)$ VERDADERO

P	q	r	$(q \vee r)$	$P \wedge (q \vee r)$	$(P \wedge q)$	$(P \wedge r)$	$(P \wedge q) \vee (P \wedge r)$	$P \wedge (q \vee r) \leftrightarrow (P \wedge q) \vee (P \wedge r)$
F	F	F	F	F	F	F	F	V
F	F	V	V	F	F	F	F	V
F	V	F	V	F	F	F	F	V
F	V	V	V	F	F	F	F	V
V	F	F	F	F	F	F	F	V
V	F	V	V	V	F	V	V	V
V	V	F	V	V	V	F	V	V
V	V	V	V	V	V	V	V	V

De Morgan

① $\sim(p \vee q) \leftrightarrow \sim p \wedge \sim q$ VERDADERO

p	q	$(p \vee q)$	$\sim(p \vee q)$	$\sim p$	$\sim q$	$\sim p \wedge \sim q$	$\sim(p \vee q) \leftrightarrow \sim p \wedge \sim q$
F	F	F	V	V	V	V	V
F	V	V	F	V	F	F	V
V	F	V	F	F	V	F	V
V	V	V	F	F	F	F	V

② $\sim(p \wedge q) \leftrightarrow \sim p \vee \sim q$ VERDADERO

p	q	$(p \wedge q)$	$\sim(p \wedge q)$	$\sim p$	$\sim q$	$\sim p \vee \sim q$	$\sim(p \wedge q) \leftrightarrow \sim p \vee \sim q$
F	F	F	V	V	V	V	V
F	V	F	V	V	F	V	V
V	F	F	V	F	V	V	V
V	V	V	F	F	F	F	V

A B

③ $P \wedge (r \vee q) \vee (r \wedge s) \leftrightarrow P \wedge r \wedge s$

P	r	q	s	r ∨ q	P ∧ (r ∨ q)	(r ∧ s)	A	B	A ↔ B
F	F	F	F	F	F	F	F	F	V
F	F	F	V	F	F	F	F	F	V
F	F	V	F	V	F	F	F	F	V
F	F	V	V	V	F	F	F	F	V
F	V	F	F	F	F	F	F	F	V
F	V	V	F	V	F	V	V	F	F
F	V	V	V	V	F	V	V	F	F
V	F	F	F	F	F	F	F	F	V
V	F	F	V	F	F	F	F	F	V
V	F	V	F	V	F	F	F	F	V
V	F	V	V	V	F	V	V	F	F
V	V	F	F	F	F	F	F	F	V
V	V	F	V	V	V	V	V	V	V
V	V	V	F	V	V	V	V	V	V
V	V	V	V	V	V	V	V	V	V

A B

(4) $p \vee (r \wedge q) \vee (r \wedge s) \leftrightarrow p \vee r \wedge s$

p	r	q	s	r∧q	p∨(r∧q)	(r∧s)	A	B	A → B
F	F	F	F	F	F	F	F	F	V
F	F	F	V	F	F	F	F	F	V
F	F	V	F	F	F	F	F	F	V
F	F	V	V	F	F	F	F	F	V
F	V	F	F	F	F	F	F	F	V
F	V	F	V	F	V	V	V	V	V
F	V	V	F	V	V	F	V	F	F
F	V	V	V	V	V	V	V	V	V
V	F	F	F	F	F	F	F	F	V
V	F	F	V	F	V	F	V	F	F
V	F	V	F	V	V	F	V	F	F
V	F	V	V	V	V	V	V	V	V
V	V	F	F	F	V	F	V	F	F
V	V	F	V	F	V	V	V	V	V
V	V	V	F	V	V	F	V	F	F
V	V	V	V	V	V	V	V	V	V