Assignment 4

By

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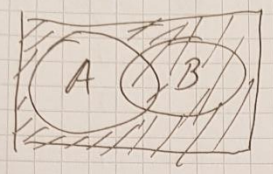
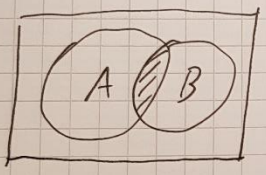
Time spent:
Christoffer -10 h
Erik -10 h

① $A^c \cap B$



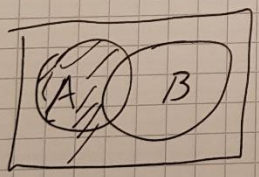
② A: third-year student B: students in data science

a)

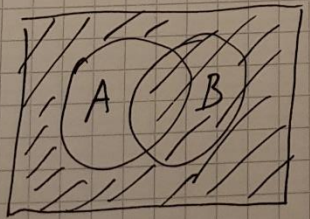


$A \cap B$

b) $A - B$



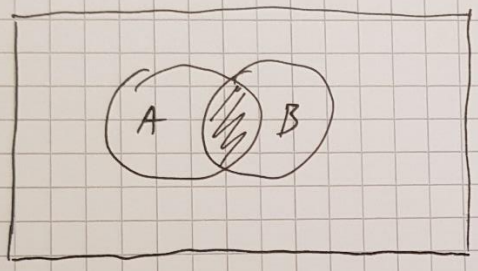
c) $A^c \cap B$



(3)

A = master Card (26%)

B = Visa (63%)



$A \cap B$

89% have credit card that are accepted
The 12% which has both MasterCard and Visa
are a part of A and B. ($A \cap B = 12\%$)

(4)

a) $\exists x\,(D(x) \cdot C(x) \cdot P(x))$

b) $\forall x\,(D(x) \mid C(x) \mid P(x))$

c) $\exists x\,(C(x) \cdot P(x) \cdot \neg D(x))$

d) $\exists x\ P(x)$

$\exists x\ D(x)$

$\exists x\ C(x)$

e)

(b) $\sim \forall x\,(P(x) \mid C(x) \mid P(x))$

By negating $\forall x$ we get $\exists x$. And inside the parantheses. Or converts to and.

$\exists x\,(D(x) \cdot C(x) \cdot P(x))$

(c) $\sim \exists x\,(C(x) \cdot P(x) \cdot \neg D(x))$

By negating $\exists x$ you get $\forall x$, and converts to or and negation of something converts to and.

(5) $(p \to q) \vee (p \to r) \equiv p \to q \vee r$

p	q	r	$p \to q$	$p \to r$	$(p \to q) \vee (p \to r)$	$q \vee r$	$p \to q \vee r$	$(p \to q) \wedge (p \to r) \equiv p \to q \vee r$
T	T	T	T	T	T	T	T	T
T	T	F	T	F	T	T	T	T
T	F	T	F	T	T	T	T	T
T	F	F	F	F	F	F	F	T
F	T	T	T	T	T	T	T	T
F	T	F	T	T	T	T	T	T
F	F	T	T	T	T	T	T	T
F	F	F	T	T	T	F	T	T

$p \to q \equiv \neg p \vee q$

p	q	$p \to q$	$\neg p$	$\neg p \vee q$
T	T	T	F	T
T	F	F	F	F
F	T	T	T	T
F	F	T	T	T