Quiz Tues Feb 13 Section 2.5

Test 2
Wed Feb 14
Sections 2.3 - 2.8
(7 Questions)
Practice Problems on website
Formula Sheet will be provided

2.6 More Laws of Logic

De Morgan's Laws

$\sim(p \wedge q) \iff \sim p \vee \sim q$ $\qquad \overline{AB} = \overline{A} + \overline{B}$

$\sim(p \vee q) \iff \sim p \wedge \sim q$ $\qquad \overline{A+B} = \overline{A}\,\overline{B}$

Quick Ex: $\overline{\overline{A} + \overline{B}} = \overline{\overline{A}}\,\overline{\overline{B}}$

$\sim(p \wedge \sim q) \iff \sim p \vee \sim(\sim q)$

Distributive Laws

$p \wedge (q \vee r) \iff (p \wedge q) \vee (p \wedge r)$ $\qquad A(B+C) = AB + AC$

$p \vee (q \wedge r) \iff (p \vee q) \wedge (p \vee r)$ $\qquad A + BC = (A+B)(A+C)$

Ex: Rewrite using the distributive laws.

a) $\overline{C}(A+C) = \overline{C}A + \overline{C}C$

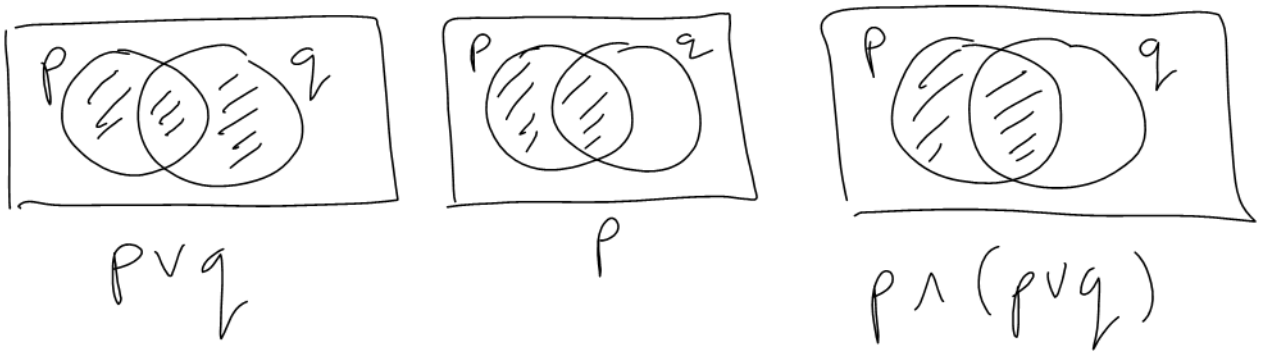
b) $(A+B)(A+\overline{B}) = A + B\overline{B}$

c) $\overline{B} + \overline{A}\,\overline{C} = (\overline{B}+\overline{A})(\overline{B}+\overline{C})$

d) $\overline{AB}\,B + \overline{AB}\,C = \overline{AB}(B+C)$

Absorption Laws

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



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

p	q	p ∨ q	p ∧ (p ∨ q)
0	0	0	0
0	1	1	0
1	0	1	1
1	1	1	1

identical

$p \wedge (p \vee q) \iff p$ $\quad A(A+B)=A$

$p \wedge (\sim p \vee q) \iff p \wedge q$ $\quad A(\bar{A}+B)=AB$

$p \vee (p \wedge q) \iff p$ $\quad A+AB=A$

$p \vee (\sim p \wedge q) \iff p \vee q$ $\quad A+\bar{A}B=A+B$

"Absorption Laws"