Q2

Def set G of formulas that uoc in $\{\neg, \vee\}$
Let G be the smallest set st:
Basis: if x is a var $x \in G$
Ind: If $F_1, F_2 \in G$ then $\neg F_1, F_1 \vee F_2 \in G$

Prove $\forall F \in G$ $\exists$ Formula F' st F' uoc $\{\ll, \mid\}$ and F LEQV F'

Basis
Let $F = x$, x is a var
Consider $F' = x$, F' uoc in $\{\ll, \mid\}$ (trivial)
$F' = F$ $\therefore$ F' LEQV F

Ind
Supp $F_1, F_2 \in G$ and $\exists$ formulas F_1', F_2' that uoc in $\{\ll, \mid\}$ and
F_1 LEQV F_1' and F_2 LEQV F_2'

Case 1
$F = \neg F_1$ Consider $F' = F_1' \ll \mid F_1'$

F_1	$\neg F_1$	$F_1 \ll \mid F_1$		
0	1	0	1	1
1	0	1	0	1

F' uoc in $\{\ll, \mid\}$ [IH]
F' LEQV $F_1 \ll \mid F_1$ [IH]
LEQV $\neg F_1$ by truth table
LEQV F as wanted

Case 2 * Using $<$ in place of $\ll$
$F = F_1 \vee F_2$ Consider $F' = (F_2' < (F_1' < \mid F_1')) < \mid F_1'$

F_1	F_2	$F_1 \vee F_2$	$(F_2 < (F_1 < \mid F_1)) < \mid F_1$		
0	0	0	1	1	0
1	0	1	0	0	1
0	1	1	0	1	1
1	1	1	0	0	1

F' uoc in $\{\ll, \mid\}$ [IH], F' LEQV $(F_2 < (F_1 < \mid F_1)) < \mid F_1$ [IH]
LEQV $F_1 \vee F_2$ by table
LEQV F as wanted

Since $\{\neg, \vee\}$ is complete
So is $\{\ll, \mid\}$ ∎