Sheffer Stroke Consider the following truth table definition for a logical connective called the *Sheffer Stroke*:

X	Y	$X\|Y$
t	t	f
t	f	f
f	t	f
f	f	t

1. Using a truth table, translate $X|Y$ into our regular SL by finding a logical equivalence.
2. Based on the logical equivalence you have proven, using logical laws, deduce that $(X|Y)|(X|Y) \equiv X \vee Y$
3. Provide the tree rules for $X|Y$ and $X|X$.
4. Using the tree rules you just invented, prove that $X|X \equiv \neg X$. You should use the proper procedure for providing logical equivalence in tree (which involves the biconditonal).

Proofs with SL Trees Verify if the following relations hold using trees. (They are not necessarily true.)

1. $I \rightarrow (J \rightarrow K) \vDash (I \rightarrow J) \rightarrow K$
2. $(H \leftrightarrow \neg Q) \leftrightarrow (H \leftrightarrow \neg M) \vDash H \rightarrow [Q \vee \neg(\neg Q \wedge M)]$
3. $\vDash \neg(A \wedge B) \leftrightarrow (\neg A \vee \neg B)$
4. $\vDash [H \rightarrow (O \rightarrow N)] \rightarrow [(H \wedge O) \rightarrow N]$
5. $A \rightarrow \neg A \equiv \neg A$
6. $(D \wedge N) \rightarrow J \equiv D \rightarrow (N \rightarrow J)$