

Pid: _____

1	$A \Rightarrow (B \Rightarrow C)$	
2	<div style="border-left: 1px solid black; padding-left: 10px;">$A \wedge B$</div>	
3	<div style="border-left: 1px solid black; padding-left: 10px;">A</div>	$\wedge E, 2$
4	<div style="border-left: 1px solid black; padding-left: 10px;">$B \Rightarrow C$</div>	$\Rightarrow E, 1, 3$
5	<div style="border-left: 1px solid black; padding-left: 10px;">B</div>	$\wedge E, 2$
6	<div style="border-left: 1px solid black; padding-left: 10px;">C</div>	$\Rightarrow E, 4, 5$
7	$(A \wedge B) \Rightarrow C$	$\Rightarrow I, 1-6$

2. (10 points) Derive $A \vee B$ from $X \vee A$ and $\neg X \vee B$ using natural derivations.

Solution:

1		$x \vee A$		
2		$\neg x \vee B$		
<hr/>				
3			A	
<hr/>				
4			$A \vee B$ $\vee I, 3$	
5			x	
<hr/>				
6				$\neg x$
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7				\perp $\neg E, 6$
8				$A \vee B$ $\perp E, 7$
9				B
<hr/>				
10				$A \vee B$ $\vee I, 9$
11			$A \vee B$	$\vee E, 2, 6\text{--}10, 10\text{--}9$
12		$A \vee B$		$\vee E, 1, 3\text{--}4, 5\text{--}11$