

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