

Remember that your work is graded on the quality of your writing and explanation as well as the validity of the mathematics.

- (1) (7 Points) Use a truth table to verify the following tautology:  $[p \vee (q \vee r)] \Leftrightarrow [(p \vee q) \vee r]$ . *Make sure to explain why your table proves the desired result.*

- (2) (7 Points) Rewrite the following statement using logical symbols such as (but not limited to)  $\forall$ ,  $\exists$ ,  $\ni$  and  $\Rightarrow$  as appropriate. Then write the negation of the statement, to explain when a function is not strictly increasing, using the same symbolism.

A function  $f$  is *strictly increasing* iff for every  $x$  and for every  $y$ , if  $x < y$ , then  $f(x) < f(y)$ .