

## INTRODUCTION TO LOGIC - HOMEWORK #2 - Due Feb 11

### 1 FORMULAS [20 POINTS]

Check whether the following are well-formed formulas of the propositional language:

$$(\varphi \wedge \psi) \rightarrow \neg(\varphi \vee (\varphi \vee \varphi))$$

$$\neg\neg\neg \rightarrow \varphi$$

Motivate your answers.

### 2 FORMULAS AS TREES [20 POINTS]

Write down the tree associated with the following well-formed formulas.

$$p \rightarrow (q \vee \neg r)$$

$$(p \rightarrow q) \vee (\neg r)$$

What is the difference?

### 3 IS WATER ALWAYS COLD? [60 POINTS]

Check whether the following is good reasoning by using the semantic method (i.e. listing possibilities and then ruling those incompatible with the premises)

(P1) The moon is made of cheddar cheese

(P2) If the moon is made of cheddar cheese, aliens will eat it

(P3) Aliens do not eat the moon

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(C) Water is always cold