

# Math 114, HW 1

Due Friday, April 10

1. Represent the following sentences in the language of sentential logic:
  - If it is the case that either the dog is in the house or it is raining then the house will be dirty; also, it's humid today.
  - It is humid today if and only if the dog is in the house.
  - If the dog is in the house, it is humid today; also, if it is humid today then the dog is in the house.
2. Come up with a formula of sentential logic representing the meaning of:
  - Squid are tasty unless they are cooked poorly.
3. Show that there are no wffs of length 2, 3, or 6, but that any other length is possible.
4. Let  $\alpha$  be a wff; let  $c$  be the number of places at which binary connective symbols  $\wedge, \vee, \rightarrow, \leftrightarrow$  occur in  $\alpha$ ; let  $s$  be the number of places at which sentence symbols occur in  $\alpha$ . Show that  $s = c + 1$ .
5. Prove that  $(A_3 \rightarrow \wedge A_1)$  is not a wff.