

Please note: answer the first four questions in light of the rules of inference (the “flowcharts”) we have seen. The first four questions are very quick to answer, but the point is to have you process and practice the flowcharts we have seen. (Pay attention to “use” versus “prove”.)

1. Say we know Olaf likes warm hugs and Anna wants to build a snowman. What (if anything) can we conclude? Briefly explain why.

2. Say we know If Olaf likes warm hugs, then Anna wants to build a snowman. In addition to this, say we also know Olaf likes warm hugs. What (if anything) can we conclude? Briefly explain why.

3. Say we know If Olaf likes warm hugs, then Anna wants to build a snowman. In addition to this, say we also know Olaf does not like warm hugs. What (if anything) can we conclude? Briefly explain why.

4. Say  $T$  is the set of all the world's turtles. Say  $M(x)$  is the predicate  $x$  has 33 feet. What steps would we have to take to prove  $\text{There exists } h \in T[M(x)]$ ?

5. Say that  $c$  and  $d$  are both integers. Prove: if  $c$  is even and  $d$  is even, then  $c - d$  is even.