

## Mathematics 2200H – Mathematical Reasoning

TRENT UNIVERSITY, Fall 2020

### Assignment # $\{\emptyset, \{\emptyset\}\}$

#### Knights and Knaves

*Due on Friday, 25 September.*

“Knights and Knaves” is a class of logic puzzles popularised by the logician Raymond Smullyan, who published several books of “recreational logic” puzzles, including one with the whimsical title *What Is the Name of This Book?* The puzzle below is #330 from a collection put online by the Department of Philosophy at Hong Kong University, which can be found at: <https://philosophy.hku.hk/think/logic/knights.php>

A very special island is inhabited only by knights and knaves. Knights always tell the truth, and knaves always lie.

You meet eight inhabitants: Sue, Carl, Homer, Dave, Zeke, Ted, Marge and Zed. Sue tells you that both Homer is a knave and Marge is a knight. Carl claims that Ted is a knave. Homer tells you that Sue is a knight or Dave is a knave. Dave tells you, “Neither Zed nor Marge are knights.” Zeke tells you that it’s false that Marge is a knave. Ted says that Carl and Zed are both knights or both knaves. Marge claims that Sue and Zed are both knights. Zed claims that Carl could claim that Homer is a knave.

1. Determine, as best you can, who is a knight and who is a knave. [10]