Mathematics 2200H – Mathematical Reasoning
Trent University, Fall 2022
Assignment #1
A Tale of the Island of Knights and Knaves
Due on Friday, 16 September.[*]

This assignment is intended to be a fun warm-up exercise, more than anything, though it does exercise some of the problem-solving and logical skills that are part of this course. Please your complete reasoning in your solution. Recall that, unless stated otherwise on a given assignment, you are permitted to work together and look things up, so long as you write up your solution by yourself and acknowledge all sources and help that you ended up using.

There is a class of logic puzzles, popularized by the philosopher and logician Raymond Smullyan, set on an island in which some of the inhabitants, the "knights", always tell the truth, and the rest of the inhabitants, the "knaves", always lie. The following is a slightly modified version of one of Smullyan's own knights and knaves puzzles.

> *Once when I visited the island of knights and knaves, I came across two of the inhabitants resting under a tree. I asked one of them, "Is either of you a knight?" I received a response, and I knew the answer to my question.*
> *Is the person to whom I addressed the question a knight or a knave? What of the other one? I can assure you that I have given you enough information to solve this problem.*

1. Solve the puzzle given above. *[10]*