

MATH 6
HANDOUT 1: LOGIC I. KNIGHTS AND KNAVES

Many of the questions of this assignment refer to the famous (among logic puzzle fans) island of Knights and Knaves. On this island, there are two kinds of people: Knights, who always tell the truth, and Knaves, who always lie. Unfortunately, there is no easy way of knowing whether a person you meet is a knight or a knave...

Copyright notice: most of these problems come from books of Raymond Smullyan. If you liked them, get his books in the library and you will find there many more puzzles of the same sort. You can also find a number of such puzzles online at <http://philosophy.hku.hk/think/logic/puzzles.php>

HOMEWORK

Please don't forget to show me in your submission exactly how you were solving the problems, your way of thinking. Just an answer is not enough!

1. On the island of knights and knaves, you meet two inhabitants: Zoey and Mel. Zoey tells you that Mel is a knave. Mel says, "Neither Zoey nor I are knaves." So, who is a knight and who is a knave?
2. On the island of knights and knaves, you meet two inhabitants: Bart and Ted. Bart claims, "I and Ted are both knights or both knaves." Ted tells you, "Bart would tell you that I am a knave." So who is a knight and who is a knave?
3. You meet two inhabitants: Zed and Alice. Zed tells you, 'Alice could say that I am a knight.' Alice claims, 'It's not the case that Zed is a knave.'
Can you determine who is a knight and who is a knave?
4. Now the island also have normals, who can either say truth or lie. Amy, Bob, and Celine are from the island of knights, knaves, and normals. One of them is a knight, one is a knave, and one is normal. Amy says that Celine is a knave. Bob says that Amy is a knight. Celine says that she is a normal. Can you figure out who is who?
5. You are in a maze on the island of knights and knaves. There are three doors: you know that one leads to freedom and the other - to certain doom. There are three guards nearby, each guard is either a knight or a knave, but you don't know who is who or how many of each there are. They allow you to ask one of them a single question before you choose a door, before you can come up with a question, guard A tells you 'Two of us are knaves'. What do you ask?