

Problem Set 2

On the Island of Bellandia, there are two types of people. There are knights, which always tell the truth, there are liars, which always lie.

1. While on the island of Bellandia you meet three locals: Alice, Bob, and Carol. Your conversation with the locals goes as follows:

You: "Alice, are you a knight or a liar?"

Alice: *indistinguishable mumbling*

You: "Bob, what did Alice say?"

Bob: "Alice said that she is a liar."

Carol: "Don't believe Bob; he is lying!"

From your conversation, who are Bob and Carol? And why?



On an island near Bellandia, there is a Forest of Forgetfulness where a girl named Alice, a Lion, and a Unicorn all frequently visit. In the forest, Alice often forgets the day of the week. Like their neighbors in Bellandia, the Lion and the Unicorn follow rules about when they lie and tell the truth. The Lion lies on Mondays, Tuesdays, and Wednesdays and always tells the truth on other days. The Unicorn lies on Thursdays, Fridays, and Saturdays and always tells the truth on the other days.

2. One day Alice met the Lion and the Unicorn resting under a tree. They made the following statements:

Lion: "Yesterday was one of my lying days."

Unicorn: "Yesterday was one of my lying days too."

From this Alice deduced the day of the week. What day was it and why?

3. On another occasion Alice met the Lion alone. He made the following two statements:

(1) I lied yesterday.

(2) I will lie again two days after tomorrow.

What day of the week was it? And how did Alice know?