

COURSE: DISCRETE MATHEMATICS

SOLVING STUDENT NO.: 1705073

VERIFYING STUDENT NO.: 1705026

## Chapter 1, Section 2

### Question:

An explorer is captured by a group of cannibals. There are two types of cannibals - those who always tell the truth and those who always lie. The cannibals will barbecue the explorer unless he can determine whether a particular cannibal always lies or always tells the truth. He is allowed to ask the cannibal exactly one question.

a) Explain why the question "Are you a liar?" does not work.

b) Find the question that the explorer can use to determine whether the cannibal always lies or always tells the truth.

Answer:

- a) If the explorer asks the question to a liar cannibal, he will answer no. If the cannibal is telling the truth, he will also answer no. So there is no way the explorer can distinguish between liar and non-liar cannibals, as both of them will answer the same to the question.
- b) The explorer needs to ask such a question that he knows the answer to it. Like he can ask, "Are you cannibal?" If the answer is yes, then the cannibal is definitely truth teller. If the answer is no, then the cannibal is a liar cannibal. Thus he can determine if the cannibal is lying or not.