Mathematical Puzzles, Games and Other Diversions
Day 22

Derrick Chung

April 28, 2020

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Some Puzzles to Ponder

Puzzle 1

Anna sets up camp after a long day. However upon seeing a hungry bear, narrowly escapes danger by quickly walking one kilometre south, one kilometre east, and one kilometer north. She realizes that after the trek, she somehow ended up right back at camp.

What colour was the bear?

Answer: The bear was white (a polar bear), since Anna must have been at the North Pole.

Question: Where else could Anna have walked 1 km south, 1 km east, and 1 km north to return to her starting point?

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Some Puzzles to Ponder (cont.)

Puzzle 2

You visit the island of Knights and Knaves, where Knights always tell the truth and Knaves always lie.

You see a fork with two paths, only one of which leads to the village. At the fork stand two islanders: one Knight and one Knave. You can only ask one question directed to one islander.

With those restrictions, can you always find the right path?

Answer: Yes, you can.
You just ask something along the lines of "If I were to ask you whether this road goes to the village, would you say yes?"

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Some Puzzles to Ponder (cont.)

Puzzle 3

On the island, there is also another tribe called Abbotters, who answer all questions randomly.

You see another fork with two paths, only one of which leads to the village. At the fork stand three islanders: one Knight, one Knave, and one Abbotter.

If you can ask only two questions, each directed to one islander, can you always find the right path?

Answer: Yes, you can.
You must ensure your second question is to a knight of knave, so question 1 to Islander A must be about Islanders B and C.
You can ask Islander A "Who out of B or C is more likely to lie?"
Then ask the question from Puzzle 2 to whoever he calls out.

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Some Puzzles to Ponder (cont.)

The Hardest Logic Puzzle Ever

Suppose you encounter a Knight, Knave and Abbotter who understand English but respond in a language you do not understand.

You do know the words for "yes" and "no" are "da" and "ja", but don't know which word means which. In this case, the Abbotter doesn't answer COMPLETELY randomly. He always tells the truth or lies, but chooses randomly between those options.

By asking three yes/no questions, each directed to one islander, can you determine which tribe each islander belongs to?

Clarifications:

▶ An islander may be asked more than one question.
▶ Questions may be chosen depending on the answers to previous questions.

Answer: Yes, you can. (see Wikipedia article)

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