

Fall 2018: Barge Problem 1

Althea in Lelowland

You and your friend Althea are visiting Lelow, a strange land. The inhabitants of Lelow, called Lelowites, are of three types. Type A always tells the truth, type B always lies, and type C sometimes lies and sometimes tells the truth. The Lelow handbook requires that any group of three Lelowites consist of one type A, one type B, and one type C. You encounter a group of three such beings, but you don't know who is which type. In hopes of identifying which type each Lelowite is, Althea approaches the first of the group, who says "I am of type (inaudible to you)." Was that an A, a B, or a C? Althea, being much closer than you, hears the answer clearly. The second Lelowite then says, "That's true", but the third says "No, it's not." Althea, who is good at these sorts of puzzles, thinks for a time and then says, "I don't have enough information yet to identify all the types, but I can get what I need by asking one question with a yes/no answer to one of the Lelowites." (It must be possible for the Lelowite to give a yes or a no as an answer to that question, regardless of inhabitant type.)

This week's problem: Which type did the first Lelowite claim to be? To which Lelowite will Althea direct her question? What is a possible question Althea might ask? Be sure to justify all of your answers completely.

Semester Prizes (per team)

First Prize	\$1000
Second Prize	\$750
Third Prize	\$500

Rules

1. Form a team with other Lafayette students. Each team must have 3, 4 or 5 members.
2. Solve the Problem of the Week with your team. The problem will be posted in the Math Department and be available electronically for everybody on the Barge Mailing List.
3. Get your solution to Tom Yuster (yustert@lafayette.edu) by submission deadline. Email is the preferred method of submission, since Prof. Yuster has no intention of ever being in his office on Saturday at 6 a.m.
4. No internet or other online sources may be consulted during the process of solving the problem and/or submitting a solution. Failure to abide by this rule may result in disqualification of the team.

Submission Deadline: Saturday, Sept 15 at 6:00 a.m.