

## Fall 2018: Barge Problem 4

### Shopping For Integers

It's 2 am and you've been working on your paper far too long. You decide to take a break and watch TV, but the only thing on is the Home Shopping Channel. It's that or your paper. So ... For \$19.95 (plus shipping and handling) you can buy a commemorative collection of 99 plaques. Each plaque has an integer embossed on it and the collection has the amazing property that no matter which single plaque you remove, the remaining 98 plaques can be split into two sets of 49 plaques each so that the sum of the 49 integers on the plaques in the first set is equal to the sum of the 49 integers on plaques in the second. Two weeks later, your collection arrives. Every plaque has the integer -17 embossed on it! If your friends find out, you'll never hear the end of it. You write an angry email to Plaques R Us, demanding they send you a collection that does not consist of 99 identical integers. The company replies that it currently has none of those in stock, but it will send you another collection (all 213s) for free, just pay shipping and handling. After fuming for a bit, you wonder: Is it possible for Plaques R Us to produce a such collection where not every integer is the same? And that's this week's problem.

### 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](mailto: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, Oct 13 at 6:00 a.m.