Gooδσελλ Gazεττε

Carleton College
Northfield, MN 55057

The newsletter for the Carleton mathematics and statistics community

May 01, 2020
Vol. 38, No. 12

Our New SDAs!

SDAs (Student Department Advisers) are students who serve two very important roles in the department. First, they help students navigate the math and stats majors and the math minor. Second, they organize a variety of social events and get-togethers around the department. We are thrilled to announce our new SDAs for next year are Jenna Korobova, Abby Loe, and Marcella Manivel. Please join us in welcoming our new SDAs for 2020-21!

Job, Internship, & Other Opportunities

Google One-on-Ones & Resume Review with Sabastian Mugazambi '17

Talk 1:1 with Sabastian about about life after Carleton, the transition to Google, machine learning landscape and how to format your resume. Date: Wednesday, May 13th, 2020. Time: 11:00 am. Location: Virtual via Google Hangout. Find details and RSVP at https://apps.carleton.edu/career/about/events/?event_id=1000073562&date=2020-05-13.

Consulting Careers Boot Camp - Introduction

Are you considering a career in consulting? Are you simply interested in learning more about this highly in demand career field? Join Carleton alumni Alison Tilson '18 (Ernst & Young), Alyssa Neidhart '18 (The Brattle Group), and Pedro Girardi '19 (Boston Consulting Group) who will give you an overview of consulting and the different areas within the field, help you become a strong applicant for highly regarded firms, and provide you with the tips and tools to prepare for the field's late summer/early fall recruiting process.

Workshop: Wednesday, May 13th at 6 pm Central Time. RSVP to access the Zoom login at carleton-csm.symplicity.com/students/index.php?mode=form&id=6fc53c86af7f84c3cb4c8094f3e4a768&s=event&ss=ws.

Mystic Valley Regional Charter School - 7th & 8th Grade Math Teacher

Mystic Valley annually finds itself among the top public schools not only within the Commonwealth of Massachusetts but in New England and throughout the nation. Our students have attained the highest levels of success at the post-secondary level, a testament to the preparation they received from their time at Mystic Valley. The Math Teacher is responsible for implementing Mystic Valley's Math program in Grades 7 and 8, and executing lessons in both Algebra 1 and Geometry. Find details at https://carleton-csm.symplicity.com/students/app/jobs/detail/d6f01f6b0e0cbd26422e7a2415267636.

Problems of the Fortnight

To be acknowledged in the next *Gazette*, solutions to the "elliptical" problems below should reach me by noon on Tuesday, May 12.

1. An artist is designing a logo based on nested ellipses. All the ellipses have the same center and the same axes of symmetry; also, they are all similar (that is, they all have the same "shape" in the sense that the ratio of their major [longer] and minor [shorter] axes is the same), but they are not all positioned "in parallel". Specifically, the first ellipse is "vertical" in the sense that its major axis is vertical; the second ellipse is "horizontal", and it is tangent at the end points of its (horizontal) major axis to the first ellipse; the third ellipse is "vertical", and it is tangent at the end points of its (vertical) major axis to the second ellipse; the fourth ellipse is "horizontal" again, and so forth. In the design, the two regions (one on top and one on the bottom) between the first and the second ellipse are shaded, the two regions between the third and the fourth ellipse are shaded, etc. Meanwhile, the two regions (one on the left and one on the right) between the second and the third ellipse, the two regions between the fourth and the fifth ellipse, etc., are left unshaded.

If the artist gets to choose the ratio $k > 1$ of the lengths of the major and minor axes, what are the possibilities for the ratio of shaded to unshaded area in the overall logo (enclosed by the first ellipse)? In particular, what value of k (if any) would produce an equal amount of shaded area and of unshaded area?

2. As those of you presently in southern Minnesota know, things are greening up and there has been a fair amount of sunny and pleasant weather. On one such day, two friends decided to make a single circuit around a wide running trail in the shape of an ellipse. Because of social distancing regulations, they had to keep at least six feet apart, and so they decided to run in parallel and exactly seven feet apart; that is, the line segment connecting them was always seven feet long and at right angles to their trajectories. They went around the ellipse counterclockwise, so the runner on the right was on the outside and ran a bit further than the one on the left. If the runner on the left ran for exactly 1000 feet to get once around the ellipse, what are the least and greatest distances that the runner on the right may have run, considering that we don't know the exact shape of the ellipse?

Correct solutions to the second problem posed April 17 came in from John Snyder and from "Auplume"; the latter also solved the first problem. Student solutions to either of those problems, as well as to the new problems above, would still be most welcome! Hoping that *Gazette* readers are managing to stay in good health and spirits despite the times ...

- Mark Krusemeyer

● ● ●

Editors: ***Adam Loy, Antonia Ritter***

Problems of the Fortnight: ***Mark Krusemeyer***

Web & Subscriptions: ***Sue Jandro***