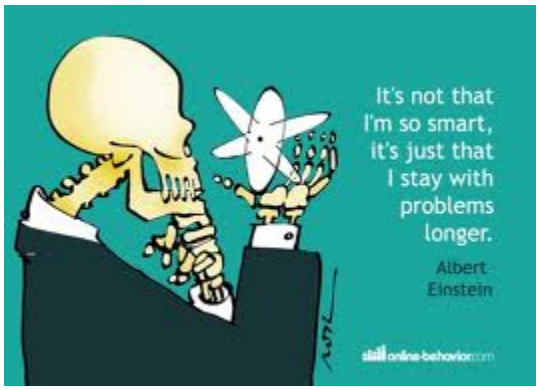
Ma 170 An Introduction to Mathematical Problem-Solving (Fall 2013)



Time and Place. Th 9-10:50, E382

Instructor. Dr. Gabriela Sanchis, 384 G Esbenshade Hall, Office Phone: 361-1339

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Office Hours. M,T,Th: 2-3:20; W:9:30-10:50; and by appointment.

Prerequisites. Placement

Content. The course does not include any new mathematical content, but rather seeks to teach students how the mathematics they already know can be useful for solving new and interesting problems. Students will learn strategies, tactics and tools useful for solving a variety of mathematics problems.

Learning Outcomes.

- Students will be able to intelligently apply problem-solving strategies to solve many different types of problems.
- Students will gain an appreciation for the qualities that are necessary to succeed in solving mathematics problems, such as persistence, self-confidence, and a willingness to think of and try a different approach (or several approaches) when the first one fails
- Students will be able to communicate solutions to problems, both orally and in writing, in a way that is understandable to their peers.

Attendance. You are expected to attend all classes. Class presentations and group work are a significant part of the course, and the class only meets once a week, so more than one absence during the semester will result in a lower grade. If you do miss a class, it is your responsibility to obtain from a classmate any notes, assignments, handouts, or anything else you may have missed.

Participation Grade. The participation grade will be computed on the basis of points earned, as follows:

- Progress report: Each week, a new set of 12 problems will be handed out of varying difficulty. Students will work on these problems during the week, and by midnight Wednesday night will make a progress report via a journal entry in Blackboard. Specifically, each student should specify which problems they have solved and are willing to present in class. Each progress report made on time is worth up to 6 points (half a point for each problem that you are willing to present).
- During class on Thursday, each student will be asked to present at most one problem on their list. Each presentation will be graded out of 5 points. To earn a perfect grade, the presentations should have the following qualities:
  (1) Solution should be correct and complete.
  (2) The presenter should speak clearly, referring to notes only sparingly or not at all.
  If a student's solution is wrong, that student forfeits all points for that day (including all progress report points).
- One extra point may be awarded for a particularly clever solution.

- Following a presentation, other students may volunteer to present their solution to the problem, provided it is a significantly different approach, and they have not already presented that day.
- Students who do no present on a particular day are responsible for making and posting videos of solutions to problems. Students can work in pairs filming each other at a whiteboard or blackboard. Each student will be assigned two problems to videotape. Each student's videos will be graded out of 5 points.

Under the above grading scheme, a student can earn up to 12 points each week (6 points for the progress report and 5 points for either an in-class presentation or a video, with one possible extra point for a particularly clever presentation). Your participation grade will be computed as the sum of your 10 best totals (so your lowest total gets dropped), divided by 100.

Note: A student can earn extra credit points by solving a problem from the latest issue of the Pi Mu Epsilon Journal or one of the MAA journals, writing up the solution, and submitting it to the journal by their due date. Links to these problems are available through Blackboard.

Uploading and Posting Videos. You will want to create a YouTube account (if you don't already have one) and upload your video to your account. Then right-click on it to copy the video url to the clipboard. Then point your browser to the Blackboard web site for this class (`blackboard9.etown.edu`), click on the Videos tab, click on the appropriate problem set, and then click on Create Thread. Under Subject, type the problem number. Then in the message tool bar, click on the Insert/Edit Embedded Media icon, then copy the video url from YouTube into the File/URL box. Click Insert. Then click Submit.

Exams. There will be two in-class exams (October 1 and November 12). Most of the problems will be identical (except for changing numbers) to ones discussed in class. Ten percent of each test will consist of new problems, but their solutions will involve tools and techniques discussed in class.

Final Exam. The comprehensive final exam is schedule for Thursday December 12, 7:30 to 10:30 a.m. It will have the same format as the two in-class exams.

Grading.

- Participation (65%), Two in-class exams (10% each) Final Exam (15%)
- Course grades will be calculated according to the following weighting:
  94-100 A; 90-93 A-; 87-89 B+; 83-86 B; 80-82 B-; 77-79 C+; 73-76 C; 70-72 C-; 67-69 D+; 63-66 D; 60-62 D-; below 60 F

Academic Integrity. All work must be one's own and must comply with the Standards of Academic Integrity defined in the Elizabethtown College Catalog (see `http://catalog.etown.edu/` and then click on **Academic Policies** in the menu on the left, and then on **Academic Judicial System**).

Disability. Elizabethtown College welcomes otherwise qualified students with disabilities to participate in all of its courses, programs, services, and activities. If you have a documented disability and would like to request accommodations in order to access course material, activities, or requirements, please contact the Director of Disability Services, Lynne Davies, by phone (361-1227) or e-mail daviesl@etown.edu. If your documentation meets the colleges documentation guidelines, you will be given a letter from Disability Services for each of your professors. Students experiencing certain documented temporary conditions, such as post-concussive symptoms, may also qualify for temporary academic accommodations and adjustments. As early as possible in the semester, set up an appointment to meet with me, the instructor, to discuss the academic adjustments specified in your accommodations letter as they pertain to my class.