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Background

From the competition literature: “The Putnam began in 1938 as a competition between mathematics departments at colleges and universities. Now the competition has grown to be the leading university-level mathematics examination in the world. Although participants work independently on the problems, there is a team aspect to the competition as well. Institutions are ranked according to the sum of the scores of their three highest-scoring participants.”

Eligibility

The Putnam is open to regularly enrolled undergraduates who have not yet received a degree, and who have not already participated *four times* in the competition.

Description of the examination

“The questions test originality and technical competence. It is assumed that contestants have some training which includes more sophisticated mathematical concepts than those in minimal courses.” The problems are difficult, and the grading is strict: partial credit is rarely given. Consequently, it is better to solve a single problem perfectly than to have partial ideas for several problems. There are 12 problems worth 10 points each. In 1999 and 2000 the median score was 0 points (and the highest scores were 74 and 96 points respectively). However, **do not be intimidated**: recent exams have featured one or two lengthy but almost routine multivariable calculus questions.

Examination schedule

Due to the pandemic, the examination has been postponed until **Saturday 20 February 2021**. There are actually two exams of exactly 3 hours each, with a 2 hour break. The first exam usually starts at **8:00 am** and the second at **1:00 pm**, but that might change this year. From the website: “If most students can return to campuses in the spring, the competition on that date can go forward in much the same form as in previous years. On the other hand, if most students are unable to return to campuses in the spring, the competition on that date will proceed in an unofficial mode, with no proctors, no prizes, no awards, but with solution papers submitted for grading by participants themselves and scores reported back privately to the individual participants.”

This course

The questions in the Putnam often cut across many disciplines: moreover it is not possible to tell in advance what type of questions will be on the exam. However, I have drawn up a short list of topics and themes which will probably prove useful not only for the exam but also for your general mathematical education. Some of these topics are not covered at all in the standard courses: others are covered but from a different point of view. The best way to really master them is through **problem solving**, which you will be doing a lot of, both individually and together. I encourage you to discuss the material and problems with each other, even though you will not be allowed to do this in the exam!

Student learning outcomes

Students successfully completing this course will have accumulated at least 30 hours of experience solving challenging mathematical problems. They will emerge as stronger mathematicians.

Official Putnam website

<https://www.maa.org/math-competitions/putnam-competition>