

The William Lowell Putnam Mathematical Competition

takes place Saturday, December 3, 2005.

In the last four years, we've been in the top three in terms of top-scoring students. Our team placed fifth twice.

Sign-up and Introductory Meeting
Mon. Oct. 3, 5:15–5:45 pm, in 380–383N

We will also discuss times and dates of problem-solving preparatory sessions. If you can't make it and are even potentially interested, please e-mail vakil@math.stanford.edu.

Sample problems:

1. In a certain college of under 5000 total enrollment, a third of the students were freshmen, two-sevenths were sophomores, a fifth were juniors and the rest seniors. The history department offered a popular course in which were registered a fortieth of all the freshmen in college, a sixteenth of all the sophomores, and a ninth of all the juniors, while the remaining third of the history class were all seniors. How many students were there in the history class?
2. Let p_n denote the n th prime, and let π_n the count of primes less than n . For example:

$$\begin{aligned}\{p\} &: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, \dots \\ \{\pi\} &: 0, 0, 1, 2, 2, 3, 3, 4, 4, 4, \dots\end{aligned}$$

Let q_n denote the number of terms of π less than n . What can you say about q_n ? (Try a few small cases!) Why is this true?

3. Determine all real numbers $a > 0$ for which there exists a nonnegative continuous function $f(x)$ defined on $[0, a]$ with the property that the region

$$R = \{(x, y) : 0 \leq x \leq a, 0 \leq y \leq f(x)\}$$

has perimeter k units and area k square units for some real number k .

For more information: <http://math.stanford.edu/~vakil/putnam05/>