

UIUC Department of Mathematics

PROBLEM OF THE WEEK

December 8, 2006

A New Year's Integral

Most Putnam exams have at least one problem that involves the year of the exam. This year's Putnam was no exception: Problem A3 asked to show that a certain sequence has 2005 consecutive terms, each divisible by 2006.

In the same spirit, here is a problem that involves both 2006 and 2007 and is perfect for doing on New Year's eve: Evaluate the integral

$$\int_0^1 \left(\sqrt[2006]{1-x^{2007}} - \sqrt[2007]{1-x^{2006}} \right) dx,$$

where $\sqrt[n]{x}$ stands for the n -th root of x .

PROBLEM OF THE WEEK ARCHIVE

<http://www.math.uiuc.edu/~hildebr/pow>