

Putnam E.12

Po-Shen Loh

18 November 2015

1 Problems

Putnam 1989/A1. How many primes among the positive integers, written as usual in base 10, are alternating 1's and 0's, beginning and ending with 1?

Putnam 1989/A2. Evaluate

$$\int_0^a \int_0^b e^{\max\{b^2x^2, a^2y^2\}} dy dx$$

where a and b are positive.

Putnam 1989/A3. Prove that if

$$11z^{10} + 10iz^9 + 10iz - 11 = 0,$$

then $|z| = 1$. (Here z is a complex number and $i^2 = -1$.)