

Problem of the Week

Proposed by Bernardo Ábrego and Silvia Fernández

March 3-10

Let $n \geq 2$ be a positive integer. A real number x is chosen uniformly at random in the interval $[0, n]$. Let $P(n)$ be the probability that $\lfloor x^2 \rfloor = \lfloor x \rfloor^2$.

Prove that

$$\lim_{n \rightarrow \infty} \frac{nP(n)}{\ln n} = \frac{1}{2}.$$

This contest is sponsored by the Mathematics Department. Open to all CSUN students. Winner gets \$10 or an equivalent prize. All complete and correct solutions get a certificate. Type and send your solution before March 10th, 9:00PM to silvia.fernandez@csun.edu. All steps of the solution must be clearly justified. For rules, winners, solutions, and more information visit: www.csun.edu/math/probweek