Samasya

Samasya is a mathematics discussion and problem solving club. We discuss a variety of mathematical topics and solve problems as well. We encourage participants to have a look at these problemsbefore the meeting. Discussion, however, will not be limited to these problems. Participants can bring their own problems or mathematical ideas they wish to discuss.

Date: 21st August, 2015
Time: 9:00 p.m.
Venue: O.P.B. WiFi Room

Problem 1. Define a subset A of $\mathbb{N}$ to be *measurable* if the sequence $\{a_n\}$ converges, where $a_n = \frac{\#(A \cap \{1,2,\ldots,n\})}{n}$. Show that the intersection of two measurable subsets need not be measurable.

Problem 2. Consider the sequence $\{s_n\}$, where,

$$s_k = \sum_{i=0}^{k} \frac{1}{i!}$$

Show that this sequence converges, and it converges to an irrational number.

Problem 3. Prove that every positive real number b has a square root by showing that the sequence $\{a_n\}$ with $a_1 = 1$ and $a_{k+1} = \frac{a_k + \frac{b}{a_k}}{2}$ converges to a number x such that $x^2 = b$.