

SCI 199Y: Random Walks and Mathematical Discovery

Discussion questions, week 26.

You have read the excerpt from “The Mathematical Tourist”, by I. Peterson.

Form a group of 3 or 4 students. Working with your group, consider (and make notes about) the following questions. We shall then discuss them as a group.

1. Why does Peterson write that “Conjecture and proof are the twin pillars of mathematics”? Give as much detail as possible.
2. Summarize the story of Colin Rourke and Eduardo Rêgo and the Poincaré Conjecture. What can we learn from this story? (List as many things as you can.)
3. Summarize the story of Louis de Branges and the Bieberbach Conjecture. What can we learn from this story? (List as many things as you can.)
4. What is the point of Rick Norwood’s analogy about the beautiful valley? Does this analogy relate to anything in your own life?
5. Describe the ant’s experiment for determining if it is on a sphere or on a torus. (Note: “torus” means “donut shape”). What would the ant learn from this?
6. What is the content of the Poincaré Conjecture? Be as precise as possible.

Note: For mathematically interested students, the book “The Mathematical Tourist” is a good and recommended source for interesting modern mathematics, explained in elementary terms.

Have a nice summer!!