

MATH 1300, Mathematical Explorations

Reasoning (Mathematical Logic)

“In mathematics, there is the concept of proving something; of knowing it with absolute certainty, which is called rigorous proof. Rigorous proof is a series of arguments based on logical deductions which build one upon the other, step-by-step until you get to a complete proof. That’s what mathematics is about.” —Simon Singh

Two 50-minute classes

Activity

Day 1: Discussion - How we know what we know: what is true, what is false, whether precise statements can be both true and false, or neither true nor false.

Day 2: Logic puzzles from Raymond Smullyan’s *The Lady or the Tiger*.

Questions for class

References and resources

[The Princess or the Tiger Puzzle](#)

Book: [The Art of Mathematics: Truth, Reasoning, Certainty, and Proof](#)

[Why Do We Have to Learn Proofs!?](#)

Notes

Assignments

Read Chapter 1 of *The Art of Mathematics: Truth, Reasoning, Certainty, and Proof*. Submit answers to the following exercises:

1. Answer 1,2,3.
2. Do 4-7. What did you think of it? Did it mess with your head?

3. Do 23-26. Have you seen such illusions before? What did you think of them? If you're interested in seeing more, look for an example [here](#), although a Google search for "optical illusions" will give you many more.
4. Do 40-43 and read the other examples described in this section. Give an example of another work (fiction, nonfiction, in any medium) which challenges our perspectives on a problem.

Follow-on activities