

## MA274, Fall 2019 — Writing Assignment 2

“If we have not found ourselves prone to confusions in reasoning, we have no doubt noticed that others sometimes are, especially our adversaries in arguments.”

Steven Cole Kleene

*Mathematical Logic*, p. 61.

This writing assignment is due on **Monday, October 11**. Your paper should be written with  $\text{\LaTeX}$  using a 12-point font and should be between two and four pages long.

Thinking clearly is hard. We all make logical mistakes when we reason about things, especially when we are emotionally invested in the result of our reasoning. And we also know that we can be fooled by well-expressed but fallacious arguments. Many logicians argue that learning a little bit of logic might help us avoid such errors.

A famous example is L. Susan Stebbing, a British logician who filled her *Modern Elementary Logic* with examples taken from the everyday debates of wartime England. For example, she asks her readers to analyze this argument: “If Frock’s book deepens our sense of humanitarian values, it is worth writing even in time of war; but it is certainly worth writing in time of war, so I conclude that his book deepens our sense of humanitarian values.”

Of course, since basic logic attempts to describe how we actually think, in some sense we already know it. Kleene, in his *Mathematical Logic*, says that it might be good to study it formally anyway: “Many of these properties we must already have been applying in verbal form, since all of us have been using propositional calculus from when we first learned to talk. However, our seeing logical principles stated succinctly with the aid of symbols may help to fix them as part of our mental apparatus. Thus the formal study of logic may reinforce and extend our native facility.”

A couple of years ago, Eugenia Cheng wrote a book called *The Art of Logic*, with subtitle *How to Make Sense in a World that Doesn’t*. You can see her talking about it on YouTube. She, too, feels that learning some logic

can help us avoid mistakes. In particular, she thinks that we might use logic to analyze the validity of the arguments we hear from politicians, professors, and others.

A new book in the same vein has just been published, Stephen Pinker's *Rationality: What It Is, Why It Seems Scarce, Why It Matters*. Kirkus Reviews said it was "A reader-friendly primer in better thinking through the cultivation of that rarest of rarities: a sound argument." A good chunk of the book is about such basic logical ideas as the difference between  $P \Rightarrow Q$  and  $Q \Rightarrow P$ .

Despite the efforts of logicians everywhere, it seems most people still don't think "correctly." So maybe all this approach doesn't really work or is insufficient by itself. Consider, for example, the phrase "pointless logic chopping," which is sometimes used to suggest that worrying about the logic of arguments can distract us from what is really important.

And sometimes logic can seem very weird. For example, you can check that if  $(P \Rightarrow Q) \Rightarrow P$  is true, then  $P$  is true (write out a truth table to see). But does that actually capture a fact about how we think?

So it's your turn: what do you think logic has to contribute to everyday life? Can it help us think better? Does it help us discover new arguments? Can it defend us from demagogues and manipulators?