

MONT 105Q – Mathematical Journeys: From Unknown to Known  
Reading and Study Questions on *Logicomix*  
and Background from *The Mathematical Experience*  
February 3,5,8,10 2016

1. Look up a biography of (the historical) Bertrand Russell (the Wikipedia page is OK). Who was Russell? What were his major accomplishments? With this in mind, as you read *Logicomix*, ask yourselves: what episodes are taken from Russell's actual life? Are there things that are added and/or omitted, invented and/or altered for the authors' purposes in this story?
2. The main part of the story of *Logicomix* (i.e. starting on p. 31) is told "in flashback" as Russell delivers a lecture (apparently fictional, by the way) on "The Role of Logic in Human Affairs." When is this supposed to be happening? What is it about the current situation in the story and Russell's past that is producing some of the angry outbursts from the people in his audience?
3. Why was Russell's encounter with Euclid and geometry so influential for his later development? What did he find so compelling about Euclid? What aspect of his family's history is he afraid of if he follows that path too far?
4. Why was geometry such an important subject in Plato's ideas in philosophy? What is the "Euclid Myth" according to Davis and Hersh in *The Mathematical Experience*? Does it seem as though the *Logicomix* version of Russell subscribes to that "Euclid Myth?" How did the discovery of non-Euclidean geometries earlier in the 19th century call this into question? (See Davis and Hersh, p. 241 for some of the technical details, and note the way that enters into the background of the 1900 Paris Congress later – point 9. below.)
5. When Russell arrives at Cambridge to begin his university education, why does he find the mathematics there so unsatisfying to him? Why does he decide he needs to concentrate on logic? Is he any more satisfied with the state of logic as a part of philosophy?
6. Who were Gottfried Leibniz and George Boole? What did they try to do for logic to take it beyond the foundations provided by Aristotle?
7. At the end of Chapter 2, Russell finds a like-minded collaborator – who is this? Look him up as well.
8. Chapter 3 is called "Wanderjahre" – that's "years of journeying (or wandering)" in German. Note the connection with our CHQ theme on page 114(!) Who are the two major figures that Russell visits in the first part of this chapter? What were they trying to do in their work? What is the meaning of the "infinite hotel" example on pages p. 126-130 and Russell's discussion of the role of infinity in mathematics? And how does this relate back to Russell's fears about his own makeup?
9. The 1900 Congress of Mathematicians was a real event and all of the named individuals in the *Logicomix* account were real people. In particular, David Hilbert did give a talk at that meeting proposing a list of 23 problems for mathematics to consider in the 20th century. The authors of *Logicomix* have done an amazingly good job of conveying some of the opinions of those people too. Who are the key figures, how do they think about mathematics, and how do they disagree?

10. What is “Russell’s Paradox?” Why is it a *paradox*? Why was this such a “big deal” – how did it (with some other similar paradoxes) precipitate a *crisis in foundations* at the start of the 20th century?
11. What was Russell and Whitehead’s response to this (in non-technical terms)? Their work is the major contribution in the “logician” school of work on foundations described in Davis and Hersh. What were the other schools that attempted to remove the paradoxes? What were the main ideas in each of them?
12. Look at the “Extrac” on pages 197–215 of *Logicomix*. What points are the authors trying to make there?
13. Who was Kurt Gödel? Why was his work so devastating to the formalist school led by Hilbert? Was the “crisis in foundations” ever satisfactorily addressed?
14. Where does all of this leave us as we try to understand the role of mathematics and logic in human affairs (as in the title of Russell’s talk)? The “Finale” of *Logicomix* suggests, though, that this whole story has a “happy ending.” What is that and why does it make a sort of sense to think that way? Do you buy it though? Is it more complicated?