

Reading Guide #12 - Intuitionism  
Brouwer, "Intuitionism and Formalism"  
Heyting, "Disputation"

Brouwer

1. How do intuitionists and formalists agree about the exactness of mathematics? How do they disagree?
  2. What evidence supported formalism over intuitionism?
  3. How was non-Euclidean geometry a problem for Kant's intuitionism? How does Brouwer's neo-intuitionism respond to this problem?
  4. How does Brouwer reclaim synthetic apriority for geometry?
  5. "For this reason, the intuitionist can never feel assured of the exactness of a mathematical theory by such guarantees as the proof of its being noncontradictory, the possibility of defining its concepts in a finite number of words, or the practical certainty that it will never lead to a misunderstanding in human relations" (81). Explain.
  6. What is the intuitionist's view of infinity? How does it differ from the formalist's view?
  7. What is the Burali-Forti paradox? According to Brouwer, how does it undermine formalism?
  8. How is Cantor's paradox a problem for the formalist? What is its lesson for the intuitionist?
  9. What does the intuitionist say about the continuum hypothesis?
  10. What is Bernstein's theorem? Why doesn't it have an intuitionistic interpretation?
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Heyting

1. What is the law of the excluded middle? What do intuitionists think about the law? Why?
2. How do intuitionists differentiate the definitions of  $k$  and  $l$ ? How do classical logicians defend their similarity?
3. How do intuitionists differ from classical logicians concerning the nature of mathematical existence?
4. How do formalists and intuitionists differ in their approaches to mathematics?
5. How do classical mathematicians regard intuitionism?
6. Do intuitionists secure their mathematical theorems using logic? Explain.
7. How, according to Letter, are intuitionists dogmatic and theological?
8. How do intuitionists oppose formalization? What is the subject of mathematics?
9. Do intuitionists lament the loss of mathematical results? Explain.
10. How is intuitionism a social phenomenon?