

REVIEW FOR THE FINAL EXAM

Vocabulary

Postulate.

Problem, Theorem.

Converse, Contrapositive.

Reductio ad absurdum.

Model.

Consistent, Complete, Simple, Independent.

Proofs

Know:

The proofs of propositions:

Euclid, I.3, 4, 9, 10, 13, 14, 16, 27, 29, 31, 32, 34, 35, 37, 39, 47;

Saccheri, 1, 3, 5;

Lobachevsky, 17, 18, 19, 22, 23, 24;

Hilbert, 10, 12, 15;

How to justify:

each step in the proofs of Euclid I.1–48;

the angle arithmetic in Lobachevsky, as shown in class, such as one finds in thms. 19, 20, 22, 23.

Miscellaneous Questions

GIVE SUPPORT FROM THE TEXTS!

1. Know which propositions/facts depend on Euclid's fifth postulate, that is, which facts are true in ordinary (Euclid's) geometry and which are true in imaginary geometry.
2. Explain Saccheri's three "hypotheses."
3. What is the structure of Euclid's Book I? How are the propositions grouped and ordered? What was Euclid trying to accomplish in Book I? Give support from the text.
4. What is Saccheri's purpose in writing his book? What reasons does he have for attempting it? What is his general strategy for doing it?

5. Be able to discuss why Lobachevsky says there are two alternatives for geometry and the hypotheses underlying each of them.

6. Be able to discuss the differences in the approaches to geometry of Euclid/ Aristotle and Hilbert. For instance, SAS. Or the significance of the Axiom of Completeness. Or compare Aristotle's proposition that a line cannot be composed of points, Euclid's definition of (the periphery of) a circle, and Hilbert's definition of a circle.

9. Discuss the *being* of the infinite (independent/incidental, actual/potential, by addition/by division) for Aristotle. How does Aristotle finally define the infinite? How is time infinite? Discuss the now. Is it divisible? Can something be in motion or at rest in the now?