MATH 406 Geometric Structures

Study Guide for Test #2

Material Covered on Test #1 that You Should Know

Bring a scientific calculator and compass and straight-edge to the test session.

1.2.1   Given the axioms for a finite geometry, like Systems 1, 2, 3, & 5, show that axioms are (a) consistent, (b) independent. (Fig. 1.2.3; Exercises 1.2: 5)

1.3.1   Do the incidence axioms (axioms of connection) comprise a complete deductive system? (Justify your answer.)

3.1.1   Write five statements that are logically equivalent to Euclid's fifth postulate.

3.1.2   State the five axioms that characterize hyperbolic geometry.

3.1.3   Prove: If Playfair's axiom is true, then the sum of the angle measures of any triangle is equal to the sum of the measures of two right angles.

3.2.1   Define: circular inversion

3.2.2   Given a point A inside a circle C of specified radius r, show how to construct the image of A under the inversion of the punctured plane in the circle C.

3.2.3   Given two points in the interior of a circle C, show how to construct a circle C' that passes through the two given points and is orthogonal to C.

3.2.4   Calculate hyperbolic distances given the relevant Euclidean distances.

3.2.5   Respond to questions like those in the investigation titled "Introduction to Non-Euclid" on pages 116-117. The test will include some related true-false items and Some short answer items.

3.2.6   Prove: Theorem 3.2.3.