Math 411. Spring 09
Advanced Euclidean Geometry. Midterm 1

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1. (15 pts) State Incidence axioms. Show that the first incidence axiom is valid for Poincare disk.

2.(15 pts) State ruler axiom and give an example of two different but equivalent coordinate systems.

3.(15 pts) Let $\mathbf{a}, \mathbf{b}, \mathbf{c}$ be three distinct collinear points. Define the notion "point **b** is between the points **a** and **c**". Show that given three distinct collinear points exactly one is between the other two.

4. (15 pts) Give a definition of convex set on a plane. Give a definition of a triangle and its interior. Show that the interior of triangle is convex.

5. (15 pts). Prove the following: three bisectors of a triangle are concurrent.

6. (15 points) Prove the following: if two medians are congruent then the triangle is isosceles.