MATH 3352 Modern Geometry I

Course Project 1 (10 pt)

INSTRUCTION

Read the following chapter of the textbook: 1.7 Project 2. A CONCRETE AXIOMATIC SYSTEM. Following the instruction in the chapter, you will use *Geometry Explorer* (GEX) to test how the Poincaré disk model satisfies the first four postulates of Euclid's Elements, but the Euclidean parallel postulate. Then, you determine whether the statements in Exercise 1.7.1 hold or not in this model. After your exploration, you will have to submit two items, (A) Project 1 Report, and (B) Project 1 Screencast Presentation.

SUBMISSION

A. Project 1 Report

Your will discuss how hyperbolic geometry is similar to Euclidean geometry and how it is different. This discussion should reference the five postulates as we have explored them in the chapter 1.7. and should include your analysis from Exercise 1.7.1.

B. Project 1 Screencast Presentation

You will create a 5-10 min video recording to explain your answers to Exercise 1.7.1 in GEX. Using Zoom or other screen capture software to record your GEX screen while demonstrating geometric constructions in the following statements in Exercise 1.7.1.

1. Rectangles can be constructed. (Try any construction you remember from high school geometry.)
2. The sum of the angles of a triangle is 180 degrees.
3. Euclid's construction of an equilateral triangle.
4. Given a line and a point not on the line there is a perpendicular to the line through that point.

Responding the first statement, for example, you would show how to create a rectangle in Poincaré disk model or how it always or sometimes fails.