MTH 385 2022-01-24 Worksheet

Exercise 1. *List Common Notions.*

Exercise 2. *List Euclid's Postulates.*

Exercise 3. *There is a long tradition of trying to minimize the number of undefined notions, common notions and postulates in mathematical systems. The goal being to prove as much as possible starting from as small a set of assumptions as possible. Why would this be a desirable goal?*

Exercise 4. *Millennia where spent trying to find proofs of the Parallel Postulate in particular. Which of Euclid's postulates is the Parallel Postulate? And, why is that a reasonable name?*

Exercise 5. *Speculate on why the Parallel Postulate drew extra attention.*

Exercise 6. *Find a list of Hilbert's Postulates and compare them to Euclid's Postulates. Do you see any buried assumptions in Euclid's Postulates after seeing Hilbert's Postulates?*

Exercise 7. *Consider the following model for a plane: The "plane" is the open unit disk in* $\mathbb{R}^2$. *Points are ordinary Cartesian points on the disk. Lines are the intersections of ordinary Cartesian lines with the disk. Make sense of intersection and containment. Which, if any, of Euclid's axioms are satisfied by this model?*

Exercise 8. *Consider the following model for a plane: The "plane" is* $\mathbb{R}^3$. *Points are ordinary Cartesian lines containing the origin. Lines are ordinary Cartesian planes containing. Make sense of intersection and containment. Which, if any, of Euclid's axioms are satisfied by this model?*