Reading

- Stillwell, 18-18.1
- *Logicomix*, sections 1 and 2.

Exercises

Axiom Systems

- Davis, page 82-83, problems 4,5,6,7,8,9

Projective Geometry

Consider these axioms for projective geometry. Undefined terms are *point* and *line*.

- (PG1) Any two distinct points lie on a unique line.
- (PG2) Any two distinct lines meet in a unique point.
- (PG3) There exist at least four points of which no three are on the same line.

1. Let ‘points’ refer to points in the plane, plus one extra point called \( \infty \). Lines are the usual straight lines in the plane, with the extra stipulation that two parallel lines meet at \( \infty \). Is this a model of projective geometry?

2. Let ‘points’ refer to points in the plane, plus the interval \( C = [0, \pi) \). Lines are the usual straight lines in the plane, with the extra stipulation that two parallel lines meet at \( \theta \in C \) where \( \theta \) is the angle the lines make with the \( x \)-axis. Is this a model of projective geometry?

Parallel Postulate

Stillwell #18.1.1, 18.1.2, 18.1.3 (angle sums of triangles and quadrilaterals)

1. Derive a formula for the sum of angles in a polygon with \( n \) sides.
2. Assume absolute geometry. Prove these two statements are equivalent:
   - T1: All triangles have angle sum 180°.
   - T2: All right triangles have angle sum 180°.