

Chapter 6. The Axiomatic Foundation

Note. In Chapters 2 through 5, projective geometry is developed as an extension of the geometry of the Euclidean plane (as, historically, it was originally introduced). Chapters 6 through 9 give an axiomatic presentation of plane projective geometry.

6.1. Introduction

Note. The axiomatic approach to geometry is explained in C. R. Wylie, Jr.'s *Foundations of Geometry* (McGraw-Hill 1964, and reprinted by Dover Publications 2009). See my online notes from this source for Introduction to Modern Geometry (MATH 4157/5157) on Chapter 1: [Introduction to Modern Geometry—Axiomatic Method Class Notes](#). In those notes, the definitions of consistent, independent, complete, and categorical axiomatic systems are defined. In this chapter we state the axioms (motivated by experience and suggestive models of projective geometry) which we will use.

Note. Using the axioms, we prove the theorems of Desargues and Pappus (see Theorems 3 and 4, respectively, in [Section 6.3. The Projectivity Axiom](#)). We also give several models of projective geometry, some finite and some infinite.

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