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Sommario/riassunto

Throughout most of this book, non-Euclidean geometries in spaces of two or three dimensions are treated as specializations of real projective geometry in terms of a simple set of axioms concerning points, lines, planes, incidence, order and continuity, with no mention of the measurement of distances or angles. This synthetic development is followed by the introduction of homogeneous coordinates, beginning with Von Staudt's idea of regarding points as entities that can be added or multiplied. Tranformations that preserve incidence are called collineations. They lead in a natural way to isometries or 'congruent transformations'. Following a recommendation by Bertrand Russell, continuity is described in terms of order. Elliptic and hyperbolic geometries are derived from real projective geometry by specializing an elliptic or hyperbolic polarity which transforms points into lines (in two dimensions) or planes (in three dimensions) and vice versa.