Hyperbolic Geometry in Two- and Three-space

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Abstract

This research involved studying about hyperbolic geometry and taking it from a planar field and applying it to a spatial field. Hyperbolic geometry simply replaces Euclid's fifth postulate with the statement: there is more than one line parallel to any other unique line. The area formula for a triangle in hyperbolic geometry is given here, derived from the general hyperbolic polygon theorem. Also, we discuss how the hyperbolic lines make angles and how these lines intersect to make angles. A triangle, for example, has three angles, but the sum of the angles is always less than 180 In order to move from two-space to three-space, we must understand what a limiting parallel is. Once conceptualized, we can move into three-space. Here, we discuss three shapes: the cylinder, the cone and the tetrahedron. The volume formula for the tetrahedron is given, and then we create an original volume formula for a cone.