

1125-VE-1254      **Jerry Lodder\*** (jlodder@nmsu.edu), New Mexico State University, Mathematical Sciences,  
Dept. 3MB, Box 30001, Las Cruces, NM 88003. *Distance in Geometry*.

A college course in plane or solid geometry is today taught from a highly polished system of axioms developed over more than two millennia, beginning with Euclid's *Elements*. In this talk we return to the geometric roots of the *Elements* and show how the Pythagorean Theorem can be taught and made transparent via the ancient Greek view of area. The Pythagorean Theorem and the area results required for its proof depend on the Euclidean Parallel Postulate (EPP), with the Pythagorean Theorem itself giving us the modern distance formula between two points. Should the EPP fail, how would distance be determined? We briefly examine the work of Felix Klein on non-Euclidean geometry for determining a "scale" for distance measure in hyperbolic geometry. These two topics, the Pythagorean Theorem and distance in hyperbolic geometry, form the material for two curricular modules for teaching geometry, based on primary historical sources. (Received September 15, 2016)