Soddy Circles

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Abstract

In this project, 2D GeoGebra Graphics is used to construct the inner and outer Soddy circles from constructing definitions. Given are any three arbitrary non-collinear points A, B, and C. A set of three tangential circles can be drawn using A, B, and C as centres. Furthermore, two circles can be drawn that are tangential to the above three circles simultaneously in the interior and exterior sense. These are known as inner and outer Soddy circles.

The Soddy circles are the solutions to many mathematical puzzles such as the four coin puzzle, the appollonian gasket, etc. Derivatives of the problem include using semicircles (Pappus' Chain) and spheres (Bowl of Integers). 2D Soddy circles construction has major electrical and biological engineering applications such as designing bundle wiring, optical fibre bundles, and in components of prosthetics.

Keywords: Soddy circle, Appollonius gasket, four coin problem