PROBLEM CORNER

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Problem 1

MathCityMap (MCM, https://mathcitymap.eu/) allows to solve tasks which are bound to coordinates. The MCM app on today's smartphones uses a global navigation satellite system (GNSS) to determine the current position. GNSS uses the intersection of spheres in the 3D space. Determine the algebraic solution of the intersection of three spheres assuming that it exists. Feel free to use a Dynamic Mathematics Software (DMS, i.e., GeoGebra) to represent the problem visually.

Problem 2

The preparation of a 3D print sometimes requires cutting a 3D object (multiple times) using a plane. Although the objective generally is not to obtain identical pieces, this is however interesting from a mathematical point of view! Find the maximum number of identical pieces obtainable by cutting a cube using 17 cutting planes. Feel free to use a Dynamic Mathematics Software (DMS, i.e., GeoGebra) to represent the problem visually.