

Math 464 QUIZ

Name: _____

The Ellipsoid Method for determining whether a polyhedron is empty or not relies on a series of ellipsoids, each ellipsoid containing half of the previous ellipsoid. Explain why there cannot be a similar “Spheroid Method” which relies only on spheroids (n -dimensional spheres).

Solution. Any sequence of spheroids, each containing half of the previous spheroid will have non-decreasing volumes. Whereas, a necessary condition of a convergent Ellipsoid algorithm is that successive ellipsoids decrease in volume by at least a multiplicative factor $0 < \delta < 1$.