Differential Geometry of Curves and Surfaces

Homework 12

Due on December 20

1. Suppose that a given Riemannian surface contains a **geodesic biangle**, that is, a domain with two corners whose sides are images of geodesics. Show that $K > 0$ at some point in the interior of the geodesic biangle, where K is the Gauss curvature.

2. A given compact surface S with Gauss curvature K can be decomposed into finitely many hexagons (that is, images by some parameterization of Euclidean hexagons) whose intersections are precisely a common edge, a common vertex or empty, such that exactly three edges meet at each vertex. Compute $\int_S K$.