Info

This note, that was found here, as a part of a collection
is written (completely with human hands) by Rupadarshi Ray,
was created on December 12, 2025 4:38:17 PM,
was last modified on January 29, 2026 3:36:58 PM, and
was exported on September 7, 2026 3:31:21 PM.

Integrating sectional curvature

dim 2

Theorem 9.3 (The Gauss–Bonnet Formula). *Let (M,g) be an oriented Riemannian 2-manifold. Suppose γ is a positively oriented curved polygon in M, and Ω is its interior. Then*

$$\int_{\Omega} K\,dA + \int_{\gamma} \kappa_N\,ds + \sum_{i=1}^{k} \varepsilon_i = 2\pi, \tag{9.6}$$

where K is the Gaussian curvature of g, dA is its Riemannian volume form, $\varepsilon_1,\dots,\varepsilon_k$ are the exterior angles of γ, and the second integral is taken with respect to arc length (Problem 2-32).

Theorem 9.7 (The Gauss–Bonnet Theorem). *If (M,g) is a smoothly triangulated compact Riemannian 2-manifold, then*

$$\int_M K\,dA = 2\pi\chi(M),$$

where K is the Gaussian curvature of g and dA is its Riemannian density.

Current note has 0 direct children and 0 total descendants.

- structures based on sets
  - manifolds
    - $\mathbb{R}$-manifold semi-Riemannian
      - Complete Riemannian manifolds
        - Integrating sectional curvature

And it has 14 siblings.

- structures based on sets
  - manifolds
    - $\mathbb{R}$-manifold semi-Riemannian
      - Complete Riemannian manifolds
        - Integrating sectional curvature
        - Riemannian manifolds with negative curvature
        - Riemannian manifolds with non-positive sectional curvature
        - Cut locus in a complete Riemannian manifold
        - Exponential map for a complete Riemannian manifold
        - Geodesic completeness $\iff$ metric completeness of Riemannian manifolds
        - Geodesics in homotopy classes
        - Homogeneous Riemannian manifolds
        - Homogeneous and isotropic Riemannian manifolds
        - Poles of a complete Riemannian manifold
        - Riemannian symmetric spaces
        - Uniquely geodesic complete Riemannian manifolds
        - Riemannian homogeneous manifolds where $\exp_p$ is a diffeomorphism
        - Complete Riemannian manifolds without conjugate points