

~~Lecture 11~~

Tangent vector fields, singular points, their degree. Total singularity of vector field \equiv Euler characteristic (a theorem).

Lecture 11 Intersection index and self-intersection. Definition and correctness. Examples. Canonical bases of cycles on surfaces. Orientable and nonorientable cases. Vector fields, its singularity and self-intersection. Cotangent bundle, its isomorphism with tangent bundle in R. metric.

Lecture 12

Definition of cobordism groups for manifolds. Intersection index on surfaces (continuation)

Lefschetz number of fixed points. Examples.

Brouwer theorem. Examples. Case of S^n .

~~Test~~ Simplest tensors. Vectors, Covectors.

Riemannian Metrics. Changes of Coordinates.

Lecture 13

Riemannian metric as a tensor (continuation). Tensor notations (indices)

Lecture 14

Tensors of 1st and 2nd rank

Tensors (continuation). See symmetric
Scalar products. Symplectic form (closed 2-forms).
Gradient systems defined by the scalar product.
Symmetric and skew symmetric cases.