

Vanishing cycles and perverse sheaves : Exercises session

II

EPFL

March 13, 2024

Exercise 1

Using the fact that odd Betti numbers of smooth projective varieties are even, show that there are compact complex manifolds that are not projective.

Exercise 2

Prove that Hard Lefschetz theorem is false over $\mathbb{Z}$.

Exercise 3

Let $X \subset \mathbb{P}^n$ be a curve of genus g . If Y is the cone over X , calculate the cohomology groups of Y .