

May 23, 2022

DIFFERENTIAL GEOMETRY 88-826 HOMEWORK SET 4

Due Date: 1 june '22

1. Compute the Gaussian curvature of the metric $f^2(dx^2 + dy^2)$ with conformal factor $f(x, y) = \frac{1}{1+C(x^2+y^2)}$, $C \in \mathbb{R}$.
2. Let $M = \{z \in \mathbb{C} : (|z|^2 - 1)(|z - 3|^2 - 1) = 0\}$. Compute the de Rham cohomology group $H_{dR}^0(M)$.
3. Let M be the manifold of problem 2. Compute the de Rham cohomology group $H_{dR}^1(M)$.