

Problem-Set

- (1) Using Gauss theorem, Compute the sectional curvature of $S^n \subseteq \mathbb{R}^{n+1}$.
- (2) Let M - complete Riemannian manifold with $K(p, \sigma) \leq 0$ for all $p \in M$ & for all $\sigma \subset T_p M$. Show that for all $p \in M$ the conjugate locus $c(p) = \emptyset$. Use this to show that the exponential map $\exp_p: T_p M \rightarrow M$ is a local diffeomorphism.
- (3) Solve question 1, 2, 3, 4, 9, 10, 13 from chapter 7.
- (4) Solve question 2, from chapter 6
- (5) Solve question 3 from chapter 5