18.950/9501 (S20): HOMEWORK 7

The book references are to do Carmo, *Differential Geometry of Curves and Surfaces.* (The numbers for the assigned problems are the same in both editions of the book.)

Due: Friday, Apr 17, on Gradescope.[1]

Exercise 1. Chapter 4–3, Problem 3.

Exercise 2. Chapter 4–3, Problem 6.

Exercise 3. Chapter 4–4, Problem 1. (Comments: (1) A parameterized *line of curvature* is a curve $\alpha \colon I \to S$ for which every tangent vector is a principal direction; that is, there exists a smooth function $\lambda \colon I \to \mathbb{R}$ so that $dN_p(\alpha'(t)) = \lambda(t)\alpha'(t)$ for all $t \in I$. (2) In part **b.**, assume that the geodesic, as a curve $\gamma \colon I \to \mathbb{R}^3$, has nonzero curvature.)

Exercise 4. Chapter 4–4, Problem 5.

Exercise 5. Chapter 4–4, Problem 12.

Exercise 6. Chapter 4–4, Problem 13.

[1]See the course website, https://math.mit.edu/~phintz/18.950-S20/, for homework policies.