Exercise 1. Chapter 2–2, Problem 16.

Exercise 2. Chapter 2–2, Problem 18.

Exercise 3. Chapter 2–3, Problem 6. (Do Carmo uses ‘differentiable’, we use ‘smooth’.)


Exercise 5. Prove that $\bar{D} = \{(x, y, z) \in \mathbb{R}^3 : x^2 + y^2 \leq 1, \ z = 0\}$ is not a regular surface.

Exercise 6. Denote by $S^2 = \{(x, y, z) \in \mathbb{R}^3 : x^2 + y^2 + z^2 = 1\}$ the unit sphere. Show that the map $\phi: S^2 \to S^2, (x, y, z) \mapsto (-x, -y, -z)$, is a diffeomorphism.