MATH2242/MATH6242 Homework 2

Due Date: August 24, 2020.

The questions are from Do Carmo, *Differential Geometry of Curves and Surfaces*, unless otherwise stated.

Chapter 2-2. Exercise 3, 11

Chapter 2-3. Exercise 4

Chapter 2-4. Exercise 1, 2, 7

In addition, in Exercise 7 of Chapter 2-4, show that if v is a unit normal to S at p, then the gradient of $f \colon S \to \mathbb{R}$ at the point p is given by $2(p - p_0) - 2[(p - p_0) \cdot v]v$. Hence, or otherwise, show that the norm of the gradient of f at p is $2|(p - p_0) \wedge v|$.