Due: Wednesday, December 6, 1:15PM

HMC Math 142 Fall 2004

Prof. Gu

Problem Set 11

Start this assignment early!

Read:

- Baby Do Carmo, Differential Geometry of Curves and Surfaces: Sections 4-4, 4-5 of Chapter 4.
- Read and fill out the blanks for the most recent handouts.
- Lecture Notes.

Do:

A: Problems on Reviewing Directional and Covariant Derivatives on E^3.

- a) Prove (ii) and (iii) of the theorem on page 5, Handout 19.

B: Problems from Lectures

- a) Carry out all the details in study locally the geodesics of a surface of revolution.
- b) Show that any geodesics of a paraboloid of revolution $z = x^2 + y^2$ which is not a meridian intersects itself an infinite number of times (See Example 6, page 258).

C: Other Problems

- a) Problem 1 on page 260, Section 4-4, Baby Do Carmo.
- b) Problem 3 on page 260, Section 4-4, Baby Do Carmo.
- c) Problem 4 on page 260, Section 4-4, Baby Do Carmo.
- d) Problem 5 on page 260, Section 4-4 Baby Do Carmo.

- e) Problem 9 on page 261, Section 4-4, Baby Do Carmo.
- f) Problem 10 on page 261, Section 4-4, Baby Do Carmo.
- g) Problem 2 on page 282, Section 4-5, Baby Do Carmo.
- h) Problem 4 on page 282, Section 4-5, Baby Do Carmo.