

Homework 5, 18.994. Due Wed October 27th

The number of points each question is worth is given in parentheses. All homework sets will be worth the same amount unless otherwise indicated.

1. do Carmo, 3.5: 12 (5), 13 (6), 14 (6)
2. Read enough of do Carmo 3.5A that you know what a ruled surface is, and show that the helicoid is one. Look at the picture of 2.5 eg 3 (p94) and convince yourself this is what the helicoid looks like. (4)
3. The purpose of this exercise is to prove that the helicoid and the plane are the only ruled minimal surfaces in \mathbb{R}^3 . References are to do Carmo.
 - (a) Read 3.5B example 6
 - (b) Define the torsion of a curve in \mathbb{R}^3 (see p18), and read the fundamental theorem of curves on p19 (1)
 - (c) compute the torsion of the helix given in 1.5 exercise 1 (2)
 - (d) 1.5 exercise 18 (8)
4. Ahlfors p73 chap 3, 2.2: 1 (4)
5. Ahlfors p130 chap 4, 3.2: 2 (4), 3(4)