PROBLEM SET 10

Due Wednesday, April 10, 2002 at the beginning of the class.

Study Sections 5.5, 6.2, 6.3 (through the definition of parallel transport on p. 195) and solve the following problems.

Section 5.5: 2 (skip the question about geodesics), 4 (skip the question about geodesics), 9 (do it only for the helicoid), 10 (There is a misprint in the problem. See the Announcements on line.)

Section 6.2: 1, 3 (only 1 and 2)

(1) Prove that if a curve $\alpha(t)$ on a surface M is both a line of curvature (i.e., $\alpha'(t)$ is an eigenvector of the shape operator, see p. 81) and a geodesic, then $\alpha(t)$ is a plane curve.
(2) Show that if a geodesic is a plane curve, then it is a line of curvature.
(3) Give an example of a line of curvature with is a plane curve and not a geodesic.