Homework 8

(1) (10 pts each) Guillemin and Pollack, Chapter 3, Section 4, Exercises 2, 3, 6, 7, 8, 10, 11; Chapter 3, Section 5, Exercises 12, 14.

(2) Let M be a compact connected hypersurface in $\mathbb{R}^{n+1}$ and let $\gamma : [0,1] \to \mathbb{R}^{n+1}$ be an arbitrarily short arc which intersects M once transversely. Then show that

$$\mathrm{wind}(M, \gamma(0)) - \mathrm{wind}(M, \gamma(1)) = \pm 1.$$