Homework for 651

Problems due April 5, 2007

1. Problem 1, page 176, in Hatcher.
2. Problem 3, page 176, in Hatcher.
3. Problem 1, page 184, in Hatcher.
4. Problem 5, page 184 in Hatcher.
5. Suppose that $f : S^2 \to \mathbb{R}^3$ is a smooth *immersion* (locally a diffeomorphism), where all the singularities are *transverse* (locally the intersection of distinct 2-dimensional planes), there are only *double points* ($f^{-1}(y)$ is at most two points for all $y \in \mathbb{R}^3$), and S^2 is a closed 2-manifold. Calculate the Euler characteristic $\chi(f(S^2))$ in terms of $\chi(S^2)$.