Homework Set 5

DUE: APR 5, 2017 (IN CLASS)

1. Shifrin (page 89): Exercise 5

2. Shifrin (page 90): Exercise 8 a, b, c, d

3. Let M be a closed surface with nonnegative curvature, that is, $K \geq 0$. Prove that if γ_1 and γ_2 are closed geodesics in M, then either they intersect or they constitute the boundary of a flat region, i.e., a region where $K = 0$.
   Give examples of both situations (just a picture suffices).

4. Compute the area of the orientable surface Σ_g of genus $g \geq 2$ if it is endowed with a metric of constant curvature -1. (This is called a *hyperbolic surface* of genus g).