

Geometry, Fall 2012

University of Maryland, Department of Mathematics course 430

HW5: (due in class October 18)

Please write-up your own solutions to problems in an organized and neat fashion and staple your sheets. If collaborating in the problem solving process please write the names of the people with whom you collaborated next to each solution.

0. Problem 2 from HW4. Only complete solutions (rigorous proofs, with complete justifications) will receive full credit—please write your proofs very carefully.

1. Give explicitly a path on S^2 , $\gamma : [0, 1] \rightarrow S^2$, that has infinite length, and moreover such that the limit $\lim_{t \rightarrow 1} \gamma(t)$ exists (by this we mean: there exists $p \in S^2$ such that $\lim_{t \rightarrow 1} \text{dist}_{S^2}(p, \gamma(t)) = 0$). Prove your claim. (Hint: first construct such a path on \mathbb{R}^2 and then try to imitate the construction on S^2 .)

2. Stillwell (GOS), problems 3.8.1, 3.8.2, 3.8.3.