Math 131 - Problem Set 9
Due Thursday, Nov 15

From Munkres: 55.1, 55.2, 57.1, 57.2, 57.3

1. Show that if S^1 is covered by two closed sets A and B, then one of them contains a pair of antipodal points. (Hint: Consider the function $f(x) = d(x, A) - d(x, B)$.)

2. (a) Prove that if S^2 is covered by 3 closed sets, then one of them contains a pair of antipodal points.

   (b) (Not to be graded – just for fun!) Show that (a) is not true if we allow 4 closed sets.