Math 145A
Winter 2014

UPDATED GENERAL INFORMATION — MARCH 6, 2014

The third quiz

The quiz on Tuesday, March 11, will involve stating definitions and/or giving short answers for some of the following:

State the definition of a connected topological space.

State the definition of a compact topological space.

State the Heine – Borel – Lebesgue Theorem.

State the Hausdorff Separation Property, which is the added condition in the definition of a Hausdorff topological space.

Which subsets of the real line are connected? Compact? Both compact and connected? [*Note:* The response should involve properties which are not explicitly mentioned in the definitions of connectedness or compactness.]

Why does every nonempty topological space contain at least one compact, and at least one connected, subset? [*Hint:* In each case we can find a FINITE subset with the required properties.]

Given a positive integer n and a positive real number D, give an example of a connected subspace of $\mathbb{R}^n$ whose diameter is at least D.