Topology – MA 564 – Spring 2015 – R. Pollack HW #1

Complete each of the following exercises.

Gamelin & Greene Chapter 1: 1,2,4,5

Freiwald

Chapter 2, pg. 74–75: E1(a), E2, E8(a,c)

Additional questions:

- 1. Let (X, d) be a metric space such that X has finitely many points. Prove that for every $x \in X$, the singleton set $\{x\}$ is open.
- 2. Consider the metric space $X = \mathbb{Z}$ endowed with the 3-adic distance function. Determine then open balls $B_1(1)$ and $B_1(4)$.
- 3. Prove that $(0, \infty)$ is an open set in \mathbb{R} (under the standard metric).

Optional questions (interesting, but not too be turned in): Gamelin & Greene, Chapter 1: 3,6