Course 212 2004-05

S h e e t   6

Due: after the lecture next Thursday

Exercise 1

What are the possible topologies on the set $\{1, 2\}$?

Exercise 2

Prove that the boundary of a set in a topological space is always closed.

Exercise 3

Give an example of topologies $\mathcal{T}_1$, $\mathcal{T}_2$ on a set X such that $\mathcal{T}_1 \not\subset \mathcal{T}_2$ and $\mathcal{T}_2 \not\subset \mathcal{T}_1$.

Exercise 4

Let X be a topological space. Prove that $f \colon X \to \mathbb{R}$ is continuous if and only if $f^{-1}(-\infty, a)$ and $f^{-1}(a, \infty)$ are open in X.