Before beginning this homework assignment, please review the guidelines for submitting homework. Please write down the total amount of time spent working on the assignment at the top of what you turn in. Remember that at least one problem from each assignment must be written in \LaTeX.

1. A BIT OF GRAPH THEORY

The next few sections of the course introduce the idea that to make sets useful we need to “dress them up”. We choose different clothes for them, depending what we want them for. One common application of sets (in both science and mathematics) is to study networks. Graph Theory is the mathematical study of networks. The second way of dressing up sets is to consider “convex sets”. Convex sets have lots of nice mathematical properties. We’ll just prove one important theorem about them: the intersection of convex sets is convex.

(1) Read Taylor, Sections 4.1 and 4.2.3 All of the following problems are from Taylor’s text.

(2) Do Exercises 4.1.5, 4.1.7, 4.1.8, 4.1.9, 4.1.12, and 4.1.14 (We’ll talk about these in class).

(3) Prove Theorem 4.1.15.

(4) Prove Theorem 4.2.3