

UPDATED GENERAL INFORMATION — FEBRUARY 4, 2016

Intersections of empty families of sets

On page 7.4 of `math145Anotes07.pdf` there is a marginal note about considering an intersection of a family of subsets $\mathbf{F} = \{A_\alpha\}$ only when \mathbf{F} is nonempty. This was also mentioned earlier in the course, and an undergraduate level discussion appears on pages 18–19 of Halmos, *Naive Set Theory*. The key point is that if the intersection of an empty family would be defined, then it would not be empty as one might expect, but instead it turns out to be everything (see also page 44 of the directory file `set-theory-notes.pdf`).

Assignments for Chapters 7 – 10

Working the exercises listed below is **strongly recommended**.

The following exercises are taken from Sutherland:

- Chapter 7: 7.1 – 7.2, 7.6
- Chapter 8: 8.3, 8.4, 8.6
- Chapter 9: 9.11, 9.14
- Chapter 10: 10.1, 10.6, 10.10 – 10.11, 10.17 – 10.18 (in the latter, the map $f \times g$ should go from $X \times X'$ to $Y \times Y'$ and not from $X \times Y$ to $X' \times Y'$)

The following references are to the file `exercises03w14.pdf` in the course directory.

- Additional exercise for Chapter 7: 2
- Additional exercises for Chapter 8: 2 – 4

The following references are to the file `exercises04w14.pdf` in the course directory.

- Additional exercise for Chapter 9: 2
- Additional exercises for Chapter 10: 1 – 3

Reading assignments from solutions to exercises

Two additional strong recommendations are

- (1) to read through the solutions to Additional Exercise 1 for Chapter 7 and Additional Exercise 5 for Chapter 8 in `exercises03w14.pdf`, both of which are worked out in the file `solutions03w14.pdf`.

- (2) to read through the solutions to Exercises 9.5, 9.8, 10.12 and 10.16 from Sutherland, Additional Exercise 3 for Chapter 9 and Additional Exercise 4 for Chapter 10 in `exercises04w14.pdf`, all of which are worked out in the file `solutions04w14.pdf`.

Further reading recommendations

The files `intro2topA-08a.pdf` and `intro2topA-08b.pdf` explain the connection between the formal concept of homeomorphism and the often seen description of topology as a “rubber sheet geometry.” Both contain color pictures which are meant to emphasize the geometric side of point set topology. In contrast, the files `intro2topA-07a.pdf` and `intro2topA-07b.pdf` concern the set-theoretic side of the subject. Throughout the subject, both sides play complementary roles: Most of the motivation and intuition is geometric, and the logical integrity of the subject is established using the techniques of set theory.