

TEXTBOOK EXERCISES

Following is a list of exercises from the textbook *Abstract Algebra, an Introduction* by Hungerford that should be completed as we progress through the text. The exercises are divided into three categories:

- A. Exercises in this category involve routine calculations or straightforward proofs. They are intended to reinforce the concepts and theorems discussed in the chapter. All of these exercises should be completed.
- B. Exercises in this category are more challenging and thought provoking than the ones in Category A but should be accessible to most students. Many of these will require a formal proof. It is not expected that you will be able to successfully complete each of these exercises on your first attempt. Do not be discouraged if you do not work all of these exercises but make sure you keep on trying. Keep a list of those that you are not able to complete, and during the semester, keep going back and attempting them again (and again). Not only will this be good review, but you may be able to work some of them several weeks later.
- C. Exercises in this category are usually quite difficult. It is not intended that you should be able to complete all of these exercises. Minimally, you should read these exercises before they are discussed in class and attempt to understand the statement of the problem. It would be a good idea to attempt to complete them before they are discussed in class.

I have added one other category of exercises: Exercises that might be discussed in class.

The following is taken from the preface of *Topics in Algebra* by I. N. Herstein describing the problems in that text. These comments seem to be appropriate for this list of exercises as well.

A word about the problems. There are a great number of them. It would be an extraordinary student indeed who could solve them all. Some are present merely to complete proofs in the text material, others to illustrate and to give practice in the results obtained. ***Many are introduced no so much to be solved as to be tackled.*** (Emphasis mine.) The value of a problem is not so much in coming up with the answer as in the ideas and attempted ideas it forces on the would-be solver. Others are included in anticipation of material to be developed later, the hope and rationale for this being both to lay the groundwork for subsequent theory and also to make more natural ideas, definitions, and arguments as they are introduced.

TEXTBOOK EXERCISES

Section	Category A	Category B	Category C	Possible Discussion
1.1	1, 2, 3(a, b)	5,6		4, 7
1.2	1, 4, 7, 8, 10, 11	16, 17, 25, 28		24, 27, 32
1.3	1, 2, 6, 7, 9	12, 14, 16, 17, 23		4, 5, 24, 25
2.1	1, 2, 3, 5, 9, 12, 15	20, 22, 24, 27, 31		11, 17, 23, 26, 29
2.2	1(c), 2, 3, 5, 6, 7	9, 10, 11		4
2.3	1, 2, 4	6, 7, 8		3, 9, 10
3.1	1, 2, 5, 7, 8, 12, 13(b),	16, 21, 25, 29, 31	37	4, 9, 26, 34, 35
3.2	1, 2, 5, 6, 7, 9, 10, 11, 13	22, 25, 27, 28, 29, 30		16, 18, 20, 23, 24
3.3	3, 4, 7, 9, 10, 13	14, 22, 23, 25, 26, 28, 32, 33		8, 16, 27, 29
App. D	2, 3, 5, 7	14, 15		16
9.4	2(a, c)	5, 6		8, 10
4.1	2, 5, 6, 7(a, c), 8	10, 13, 16, 17		12, 14
4.2	2, 3, 4, 5(a,c,f)	8, 14, 15		16
4.3	2, 5, 6, 9, 10, 12	16, 20, 23		
4.4	2(a, d), 3(b, c), 4(a), 5, 6, 7, 8(a, b, e), 11	12, 13, 17, 24		9, 14, 18, 19, 20, 21, 25, 26