Exercises for Week 3

The work handed in should be entirely your own. You can consult the textbook and/or the class notes but nothing else. To receive full credit, justify your answer in a clear and logical way. Due Sept. 22.

Reading. Read Sections 1.6, 1.7 (optional), 2.1 of the textbook carefully. The proof of maximal chains of linearly independent subsets is the subject of Section 1.7, which is another proof for the existence of bases. This section is optional material, but it is recommended you read it through.

1. Section 1.6 Exercise 2 (a) (b) 3 (b) (c), 5, 11, 12, 17
2. Use Lagrangian interpolation to find a polynomial $f(x)$ of degree less than or equal to 2, such that
$$f(0) = 2, \quad f(1) = 4, \quad f(2) = 6.$$
Can you find this polynomial more directly? What is the degree of the polynomial? Does this contradict the Interpolation Theorem?
3. Section 2.1 Exercise 1, 2, 5, 6, 9 (a) (c), 15, 17, 22