Study guide

- (§3.1) Understand the notion of a "vector space" intuitively. For this course, you do not need to know or work with the formal axioms.
- (§3.1) Know the notation for the four main vector spaces we work with: $\mathbb{R}^n, \mathcal{P}_d, \mathcal{C}[a,b], M_{m\times n}$ (note: my notation $\mathcal{C}[a,b]$ from class is slightly different from the book's notation; you can feel free to use whichever you like).
- (§3.2) Know the definition of a subspace, and how to formally prove that something is a subspace of a vector space V.
- (§3.2) Know what subsapces of $\mathbb{R}^3$ look like geometrically.

Textbook problems

Note: The first several problems are from earlier sections, and concern applying terms like "linear combination" to objects besides column vectors, which we did not discuss until this week.

- §2.2: 18, 39
- §2.3: 24, 28
- §3.1: 6
- §3.2: 18, 20, 26, 30, 44, 50

Supplemental problems:

1. Prove that $\{\sin x, \cos x\}$ is a linearly independent set in $\mathcal{C}[-\pi,\pi]$. (*Hint:* There are many ways to approach this; be creative! One suggestion: if two functions are equal, then you can evaluate them at any number to get two equal numbers. You can use this to get a large supply of equations of numbers from one equation of functions.)