

MA 565 Homework 3
Due Friday, September 18

Axler Chapter 2A, # 5,7,9,16
Axler Chapter 2B, # 1
Axler Chapter 2C, # 1,10,12

1. Let V and W be finite-dimensional vector spaces. What is the dimension of $\text{Hom}(V, W)$?
2. (a) Let $\mathbb{R}^{\oplus\infty}$ be the vector space of all sequences (x_1, x_2, x_3, \dots) , where the x_i 's are real numbers, only finitely many of which are nonzero. Find a basis for $\mathbb{R}^{\oplus\infty}$ and prove that it is a basis.
(b) Let \mathbb{R}^∞ be the vector space of all sequences (x_1, x_2, x_3, \dots) , where the x_i 's are real numbers. Is the basis you found for $\mathbb{R}^{\oplus\infty}$ also a basis for \mathbb{R}^∞ ? Why or why not?