Math 311

Chapter 6

Section 6.4: Finite Dimensional Spaces

Contents

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EXAMPLE 1.

    a) The vector space $\mathbb{R}^m$ is a finite dimensional space because it is spanned by a finite set of vectors, that is $\{\mathbf{e_1}, \mathbf{e_2}, \ldots, \mathbf{e_m}\}$.

    b) The vector space $\mathbf{P}_n$ is a finite dimensional space because it is spanned by a finite set of vectors, that is $\{1, x, x^2, \ldots, x^n\}$.

EXAMPLE 2. Is the vector space of all polynomials $\mathbf{P}$ a finite dimensional?

SOLUTION.

DEFINITION 1. A vector space V is called **finite dimensional** if it is spanned by a finite set of vectors. Otherwise, it is called **infinite dimensional**.