

The Dimension of a Vector Space

MATH 204: Linear Algebra

Prepare for class November 28, 2018

Name (Print): _____

After reading Section 4.5, work through the following ideas.

1. State Theorem 4.9: More Vectors than in a Basis Theorem.
2. Does Theorem 4.9 sound familiar? Why?
3. Suppose \mathcal{B} contains 7 vectors and is a basis for a vector space V , and suppose that H is a set of linearly independent vectors in V . What does Theorem 4.9 tell us about the number of vectors in H ?
4. State Theorem 4.10: Bases Have the Same Size Theorem.

5. Write the definitions of finite-dimensional, dimension and infinite-dimensional.

6. Try Exercise 1 on page 231.

7. Describe what the different possibilities are for dimensions of subspaces of \mathbb{R}^3 and how to visualize them. How many of each type exist?

8. State Theorem 4.11: The Expansion Theorem.

9. (a) State Theorem 4.12: The Basis Theorem.

(b) Why did the authors say this theorem is so important?

10. State the fact (Dimension of $\text{Nul } A$ and $\text{Col } A$) on page 230.

11. Try Exercise 13 on page 231.

12. Write down any questions you have on the reading.