

Reading Assignment 5

Read Sect. 2.1

1. In calculus, what are two examples of linear transformations?
2. In geometry, what are examples of linear transformations? Give examples of these transformations in \mathbb{R}^2 .
3. Define a linear transformation.
4. List some properties of linear transformations.
5. Define the identity transformation and the zero transformation.
6. What is the nullspace? What is the range? Assume the reader has not read the book and doesn't know what the symbols mean.
7. Both the nullspace and the range are subspaces by Theorem 2.1. Indicate of what vector space they are subspaces of? Explain.
8. How do we obtain a generating (spanning) set for the range of a linear transformation?
9. What is the rank and nullity of a linear transformation?
10. What does the dimension theorem says? Be precise.
11. State the definition of one-to-one and onto.
12. What can you say about $N(T)$ if T is one-to-one?
13. In what special case are the conditions of one-to-one and onto equivalent?
14. What is one of the most important properties of a linear transformation? State the theorem that describes this property.

Practice Problems: # 1 (justify), 2, 3, 5, 6, 9