

MATH 110 Homework 3

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Due Monday, July 14.

- Let β be a subset of a finite dimensional vector space V . Prove that β is a basis for V if and only if any two of the following hold:
 1. β is linearly independent.
 2. $V = \text{span } \beta$.
 3. $|\beta| = \dim V$.
- Let $T : V \rightarrow W$ be a linear transformation, with V and W both finite dimensional vector spaces. Prove that T is an isomorphism if and only if any two of the following hold:
 1. T is one-to-one.
 2. T is onto.
 3. $\dim V = \dim W$.
- Section 2.5: 6, 9, 10.
- Section 3.1: 2, 4, 5, 8.
- Section 3.2: 3, 6, 14, 17, 21, 22.
- Section 3.3: 2, 3, 9.
- Section 3.4: 9, 12, 13.