MATH 110 Homework 4

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Due Monday, July 21.

- Let V be a vector space over a field F, with W a subspace of V and X a subspace of W.
  - Prove that W/X is a subspace of V/X.
  - Let $T : V/W \to (V/X)/(W/X)$ be given by

$$T(v + W) = (v + X) + W/X$$

    * Prove that T is well-defined.
    * Prove that T is linear.
    * Prove that T is an isomorphism.
- Section 4.1: 4, 10.
- Section 4.2: 4, 13, 19, 24, 29.
- Section 4.3: 2, 3, 10, 11, 13, 15, 18, 21.
- Section 5.1: 2, 3, 7, 8, 12, 15, 20, 23.