MATH 121

Homework 5, due October 8

Part I

(1) Axler, page 60, Problem 18.

(2) Axler, page 61, Problem 19.

(3) Axler, page 61, Problem 22.

(4) Axler, page 61, Problem 23.

(5) Axler, page 61, Problem 24.

Part II

(6) Axler, page 94, Problem 1.

(7) Axler, page 94, Problem 2.

(8) Axler, page 94, Problem 3.

(9) Axler, page 94, Problem 5.

(10) Let V be a finite dimensional vector space over F.

a) Show that an invertible linear operator $T : F^2 \to F^2$ maps a basis to another basis.

b) Suppose $F = \mathbb{Z}/2\mathbb{Z}$. What is the probability that a linear operator $T : F^2 \to F^2$ is *not* invertible when randomly choosing out of all such maps?