22A Homework 2

Due Friday April 13, 5pm Wellman Boxes

KILL = Kolman/Hill, Edition 8, "*Introductory Linear Algebra*"

Question 1 KILL 1.4, p 49-50, qq 2, 4, 14, 16, 20, 24.

Question 2 KILL 1.4, p 51-52, qq T2, T10, T40.

Question 3 Complex analysis is the study of numbers z = x + iy where $i^2 = -1$. Can you find a way to represent complex numbers as 2×2 matrices?

Question 4 What is "proof by induction"? Use this method to prove that matrix multiplication is associative (*i.e.* A(BC) = (AB)C). You may assume the block multiplication property for matrices.

Question 5 KILL 1.5, p 61, qq 2, 4, 6, 8, 12, 14, 16.

Question 6 Find all matrix transformations $f : \mathbb{R}^2 \to \mathbb{R}^2$ which leave the length of vectors in the plane unchanged.