22A Homework 7

Due Friday May 18, 5pm Wellman Boxes

HIKO \equiv Kolman/Hill, Edition 8, "Introductory Linear Algebra"

REMINDER: Midterm Friday May 18, 12:10pm

Question 1 Explain, by way of an example, how to use reduced row echelon form to construct a basis from a set of linearly dependent vectors that span a vector space.

Question 2 Let S be the set of all vectors in \mathbb{R}^3 whose length is less than one. Is S a vector subspace? Explain and draw a picture.

Question 3 The houses in Telephone City are connected by copper cables. The telephone company, CablecomTM maintains a large, square, matrix of ones and zeros determined by whether any pair of buildings are connected to one another by a cable. Their engineers call this the "adjacency matrix". Suppose there are five houses in Telephone City. Investigate the behavior of the largest eigenvalue of the adjacency matrix for various cable configurations. Draw pictures and analyze your results.

Question 4 HIKO 6.1, p 278, qq 2, 4, 10, 18.

Question 5 HIKO 6.1, p 278, qq T2, T4, T6.

Question 6 HIKO 6.2, pp 287-289, qq 2, 4, 10, 16, 20, 24, 28.

Question 7 HIKO 6.2 p 290, qq T2, T4, T6, T8, T12.

Question 8 HIKO 8.1pp 420-421, qq 2, 4, 6, 8, 10, 12, 16, 20, 22, 26.

Question 9 HIKO 8.1, p 421, qq T1, T2, T4, T5, T6, T10.

Question 10 HIKO 6.3, p 301, qq 2, 5, 6, 10, 16.

Question 11 HIKO 6.3, p 302, qq T2, T12.

Question 12 HIKO 6.4, pp 314-315, qq 2, 8, 12, 14, 20, 28, 30, 34.

Question 13 HIKO 6.4, p 316, qq T4, T8.