Math 312, Homework 8 (due Friday, November 9th)

Name:_____ (if you choose to use this as a coversheet)

Reading Section 7.2 – 7.5 of Bretscher.

Book problems

- Section 7.4, problems 40, 42, 43, 50, 63 (Remember, a linear transformation is diagonalizable if you can find a basis of eigenvectors.)

- Section 7.5, problems 13, 16, 24, 27

Additional Problems

1. This asks you to come up with four examples. In each case, find a matrix (perhaps 2×2) that is:

   (a) both invertible and diagonalizable.

   (b) not invertible, but is diagonalizable.

   (c) not diagonalizable, but is invertible.

   (d) neither invertible nor diagonalizable.

2. Repeat our in-class example on the glucose-insulin model (partly appearing at the start of section 7.5), where the matrix A is changed to be:

$$A = \begin{bmatrix} 0.8 & -0.4 \\ 0.1 & 0.8 \end{bmatrix}.$$

   You can use technology if desired to find the eigenvalues. What is the first time at which the glucose excess is negative? What about for the insulin excess?