MATH 2270

Quiz #8 - Fall 2008

Name: _____

1. (5 points) Find an eigenbasis for the matrix

$$A = \begin{pmatrix} 2 & -2 \\ 1 & -1 \end{pmatrix}.$$

2. (4 points)

(a) For which values of a and b is the following matrix diagonalizable?

$$A = \begin{pmatrix} 1 & a \\ 0 & b \end{pmatrix}.$$

(b) For which values of a, b, and c is the following matrix diagonalizable?

$$A = \begin{pmatrix} a & b \\ b & c \end{pmatrix}$$

3. (2 points) True or false. Indicate whether the following statements are true or false.

   (a) All invertible matrices are diagonalizable.

   (b) The algebraic multiplicity of an eigenvalue cannot exceed its geometric multiplicity.