Week 8 Day 1

Eigenstuff

Make sure you know your neighbors' names. Then take 2 minutes to discuss what you understand about each of the following linear algebra terms:

Eigenvalue, eigenspace, eigenvector, characteristic polynomial

Diagonalization

1. (A) True or (B) False? The following matrix is diagonalizable.

$$\begin{bmatrix} 1 & 0 & 2 \\ 0 & -1 & 1 \\ 0 & 0 & 3 \end{bmatrix}$$

2. If A is a square matrix with $\det(A) = 0$, then...

(A) A must be diagonalizable.

(B) A cannot be diagonalizable.

(C) Can't say for sure either way.

3. If $\lambda = 1, 2, 3$ are all of the eigenvalues of a 4×4 matrix A, then...

(A) A must be diagonalizable.

(B) A cannot be diagonalizable.

(C) Can't say for sure either way.

4. (A) True or (B) False? Every diagonal matrix is diagonalizable.

5. (A) True or (B) False? Every invertible matrix is diagonalizable.

6. (A) True or (B) False? If an $n \times n$ matrix A is diagonalizable, it must have n distinct eigenvalues.