

Part I (due Monday, April 22 at the beginning of class)

Finish up Example 3 on the Eigenvalues and Eigenvectors handout, read Theorem 1, and see what you can do with filling in the blanks between Finding Eigenvectors and Example 4.

Part II: Exercises (due by class time Wednesday, April 24)

There will be a [WeBWorK](#) assignment posted by Friday night.

Part III: Homework (due Wednesday, April 24 at the beginning of class)

1. True or False? If true, prove; if false, give an explained counterexample.
 - (a) A is invertible if and only if $A^T A$ is invertible.
 - (b) If E is an elementary matrix, then $E\vec{x} = \vec{0}$ has only the trivial solution.
 - (c) If A is a square matrix and $A\vec{x} = \lambda\vec{x}$ for some nonzero scalar λ , then \vec{x} is an eigenvector of A .
2. Show that the characteristic equation for a 2×2 matrix A can be written as $\lambda^2 - \text{tr}(A)\lambda + \det(A) = 0$.

Running list of vocabulary words that could be a quiz word

- linear equation
- system of linear equations
- linear combination of a set of vectors
- span of a set of vectors
- linearly independent
- linearly dependent
- reduced row echelon form
- pivot
- homogeneous system
- free variable
- row equivalent
- consistent system
- inconsistent system
- trace of a matrix

- transpose of a matrix
- inverse of a matrix
- elementary matrix
- transformation
- domain
- codomain
- range
- vector space (I will not ever ask you to define this on a quiz—the definition is way too long—but you should make sure you know what makes something a vector space)
- subspace
- basis
- finite-dimensional vector space
- dimension
- coordinate vector
- column space of A
- row space of A
- null space of A
- rank
- nullity
- linear transformation
- kernel
- range
- isomorphism
- isomorphic vector spaces
- characteristic equation
- eigenvector
- eigenvalue