

**Math 224**  
**Daily Objectives**  
**Class Session 14**  
**Tuesday, October 16, 2007**

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**5.1: Eigenvalues and Eigenvectors**

- Definition of eigenvalue, eigenvector, and eigenspace
- How to use eigenvalues and eigenvectors to compute powers of matrices
- How to compute eigenvalues and eigenvectors
- The characteristic polynomial of a matrix
- Properties of eigenvalues and eigenvectors (homework)
- Eigenvalues and eigenvectors of a linear transformation. For now, you can replace  $V$  with  $\mathbf{R}^n$  in Definition 5.2, i.e. Let  $T$  be a linear transformation  $T : \mathbf{R}^n \rightarrow \mathbf{R}^n$ . A scalar  $\lambda$  is an eigenvalue of  $T$  if there is a nonzero vector  $\mathbf{v}$  in  $\mathbf{R}^n$  such that  $T(\mathbf{v}) = \lambda\mathbf{v}$ .