Eigenvalues and Eigenvectors

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- Eigenvalues are denoted by the Greek letter lambda (λ)
- Let $\mathbf{A}$ be an $n \times n$ matrix. The scalar λ is called an eigenvalue of $\mathbf{A}$ when $\in \overrightarrow{x} \neq 0$ such that $\mathbf{A}\overrightarrow{x} = \lambda\overrightarrow{x}$
- Let $\mathbf{A}$ be $n \times n$
  1. An eigenvalue of $\mathbf{A}$ is a scalar λ such that $|\lambda\mathbf{I} - \mathbf{A}| = 0$
  2. Eigenvectors of $\mathbf{A}$ corresponding to λ are non-zero solutions of $(\lambda\mathbf{I} - \mathbf{A})\overrightarrow{x} = \overrightarrow{0}$
  3. $p(\lambda) = |\lambda\mathbf{I} - \mathbf{A}| = 0$ is the characteristic equation