

ECE 601 Linear Systems

Practice Problems Set #2

Due Date: Not collected. Solutions posted by October 26, 2025.

1. Kailath Problem 2.4-3
2. Kailath Problem 2.4-14
3. Kailath Problem 2.5-1
4. Kailath Problem 2.5-12
5. **A Certain Commutativity Property:** Let $A \in \mathbb{R}^{n \times n}$ be an arbitrary matrix and $b(s)$ be any degree n polynomial. Extend the domain of $b(s)$ to $\mathbb{R}^{n \times n}$ in the usual way.
 - (a) Show that in general $\lambda(b(A)) = b(\lambda(A))$, where $\lambda(\cdot)$ denotes any eigenvalue of its matrix argument.
 - (b) How does the result in part (a) simplify if $b(s)$ is the characteristic polynomial of A ?