

Chapter	concepts / theory	tasks.
5.3	Diagonalization. eg. of a similarity transformation. Algebraic vs. geometric multiplicity.	diagonalize any square matrix (by finding eigenvals & eigenvs) or show it's not diagonalizable.
4.9	Markov chains, stochastic matrix. regular stoch. matrix, convergence.	fill entries in a stochastic matrix. find steady-state probability vector.
5.6	Dynamical systems, attractors, repellers, saddle points.	get $A^k = P \mathcal{D}^k P^{-1}$ from diagonalizing A . categorize the origin's stability, sketch trajectories.
6.1	Orthogonality, pythagoras. 4 fundamental spaces, $(\text{Row } A)^{\perp} = \text{Null } A$.	check \perp , normalize vectors, check if vectors in W^{\perp} .
6.2	Projection orthogonal matrix U .	project \vec{y} onto $\text{Span}\{\vec{u}_i\}$. use $U^{-1} = U^T$.
6.3	Orthog. projections. Orthog. Decomp. Thm. Best Approx. Thm.	project \vec{y} onto W , given orthogonal basis. $\hat{\vec{y}} = UU^T \vec{y}$.
7.1	Symmetric matrices. Orthogonal Diag-Spectral Thm.	orthogonally diagonalize (even if algebraic mult. = 2) a 2×2 or 3×3 matrix.
6.5	Least Squares.	solve for $\hat{\vec{x}}$, \vec{b} given means $A\vec{x} = \vec{b}$. via Normal Equations