ATH 228: Linear Algebra and Differential Equations

ton, Elementary Linear Algebra, 8th Edition

.1 Intro to Systems of Linear Equations
.2 Gaussian Elimination
.3 Matrices and Matrix Operations
.4 Inverses; Rules of Matrix Arithmetic
.5 Elementary Matrices; Finding A^{-1}
.6 Further Results on Systems, Invertibility
.7 Diagonal, Triangular, and Symmetric Matrices
.1 The Determinant Function
.2 Evaluating Determinants by Row Reduction
.3 Properties of the Determinant Function
.4 Cofactor Expansion; Cramer's Rule
.1 Euclidean n-Space
.2 Linear Transformations from R^n to R^m
.3 Properties of Linear Transformations
.1 Real Vector Spaces
.2 Subspaces
.3 Linear Independence
.4 Basis and Dimension
.5 Row Space, Column Space, and Nullspace
.6 Rank and Nullity
.1 Inner Products
.2 Angle and Orthogonality
.3 Orthonormal Bases; Gram-Schmidt Process; QR-Decomposition
.4 Best Approximation; Least Squares
.5 Orthogonal Matrices; Change of Basis
.1 Eigenvalues and Eigenvectors
.2 Diagonalization
.3 Orthogonal Diagonalization
.1 General Linear Transformations
.2 Kernel and Range
.3 Inverse Linear Transformations
.4 Matrices of General Linear Transformations
.5 Similarity

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.1-1.3 Intro to Differential Equations
.1 Linear Equations
.2 Separable Equations
.3 Modeling with First Order Equations
.4 Differences Bewteen Linear and Nonlinear Equations)
.5 Autonomous Equations and Population Dynamics
.6 Exact Equations and Integrating Factors
.1 Homogeneous Equations with Constant Coefficients
.2 Fundamental Solutions of Linear Homogeneous Equations
.3 Linear Independence and the Wronskian