Based on the book: College Algebra by Sullivan (Pearson publications)
Other books cover similar topics.

**College Algebra Assessment Exam**

**Topics to study:**

**Chpt 5: Polynomial & Rational Functions**

5.1.1 Identify Polynomial Functions and Their Degree
5.1.2 Graph Polynomial Functions Using Transformations
5.1.3 Identify the Real Zeros of a Polynomial Function and Their Multiplicity
5.1.4 Analyze the Graph of a Polynomial Function
5.1.5 Build Cubic Models from Data
5.2.1 Find the Domain of a Rational Function
5.2.2 Find the Vertical Asymptotes of a Rational Function
5.2.3 Find the Horizontal or Oblique Asymptotes of a Rational Function
5.3.1 Analyze the Graph of a Rational Function
5.3.2 Solve Applied Problems Involving Rational Functions
5.4.1 Solve Polynomial Inequalities
5.4.2 Solve Rational Inequalities
5.5.1 Use the Remainder and Factor Theorems
5.5.2 Use the Rational Zeros Theorem to List the Potential Rational Zeros of a Polynomial Function
5.5.3 Find the Real Zeros of a Polynomial Function
5.5.4 Solve Polynomial Equations
5.5.5 Use the Theorem for Bounds on Zeros
5.5.6 Use the Intermediate Value Theorem
5.6.1 Use the Conjugate Pairs theorem
5.6.2 Find a Polynomial Function with Specified Zeros
5.6.3 Find the Complex Zeros of a Polynomial

**Chpt 6: Exponential & Logarithmic Functions**

6.1.1 Form a Composite Function
6.1.2 Find the Domain of a Composite Function
6.2.1 Determine Whether a Function is One-to-One
6.2.2 Determine the Inverse of a Function Defined by a Map or a Set of Ordered Pairs
6.2.3 Obtain the Graph of the Inverse Function from the Graph of the Function
6.2.4 Find the Inverse of a Function Defined by an Equation
6.3.1 Evaluate Exponential Functions
6.3.2 Graph Exponential Functions
6.3.3 Define the Number $e$
6.3.4 Solve Exponential Equations
6.4.1 Change Exponential Expressions to Logarithmic Expressions and Logarithmic Expressions to Exponential Expressions
6.4.2 Evaluate Logarithmic Expressions
6.4.3 Determine the Domain of a Logarithmic Function
6.4.4 Graph Logarithmic Functions
6.4.5 Solve Logarithmic Equations
6.5.1 Work with the Properties of Logarithms
6.5.2 Write a Logarithmic Expression as a Sum or Difference of Logarithms
6.5.3 Write a Logarithm Expression as a Single Logarithm
6.5.4 Evaluate Logarithms Whose Base Is Neither 10 nor $e$
6.6.1 Solve Logarithmic Equations
6.6.2 Solve Exponential Equations
6.6.3 Solve Logarithmic and Exponential Equations Using a Graphing Utility
6.7.1 Determine the Future Value of a Lump Sum of Money
6.7.2 Calculate Effective Rates of Return
6.7.3 Determine the Present Value of a Lump Sum of Money
6.7.4 Determine the Rate of Interest or Time Required to Double a Lump Sum of Money
6.8.1 Find Equations of Populations That Obey the Law of Uninhibited Growth
6.8.2 Find Equations of Populations That Obey the Law of Decay
6.8.3 Use Newton’s Law of Cooling
6.8.4 Use Logistic Models

Chpt: 8
Systems of Equations & Inequalities
8.1.1 Solve Systems of Equations by Substitution
8.1.2 Solve Systems of Equations by Elimination
8.1.3 Identify Inconsistent Systems of Equations Containing Two Variables
8.1.4 Express the Solution of a System of Dependent Equations Containing Two Variables
8.1.5 Solve Systems of Three Equations Containing Three Variables
8.1.6 Identify Inconsistent Systems of Equations Containing Three Variables
8.1.7 Express the Solution of a System of Dependent Equations Containing Three Variables
8.2.1 Write the Augmented Matrix of a System of Linear Equations
8.2.2 Write the System of Equations from the Augmented Matrix
8.2.3 Perform Row Operations on a Matrix
8.2.4 Solve a System of Linear Equations Using Matrices
8.3.1 Evaluate 2 by 2 Determinants
8.3.2 Use Cramer’s Rule to Solve a System of Two Equations Containing Two Variables
8.3.3 Evaluate 3 by 3 Determinants
8.3.4 Use Cramer’s Rule to Solve a System of Three Equations Containing Three Variables
8.3.5 Know Properties of Determinants
8.4.1 Find the Sum and Difference of Two Matrices
8.4.2 Find Scalar Multiples of a Matrix
8.4.3 Find the Product of Two Matrices
8.4.4 Find the Inverse of a Matrix
8.4.5 Solve a System of Linear Equations Using an Inverse Matrix
8.6.1 Solve a System of Nonlinear Equations Using Substitution
8.6.2 Solve a System of Nonlinear Equations Using Elimination
8.7.1 Graph an Inequality
8.7.2 Graph a System of Inequalities

Chpt 9:
Sequences, and the Binomial Theorem
9.1.1 Write the First Several Terms of a Sequence
9.1.2 Write the Terms of a Sequence Defined by a Recursive Formula
9.1.3 Use Summation Notation
9.1.4 Find the Sum of a Sequence
9.2.1 Determine if a Sequence is Arithmetic
9.2.2 Find a Formula for an Arithmetic Sequence
9.2.3 Find the Sum of an Arithmetic Sequence
9.3.1 Determine if a Sequence is Geometric
9.3.2 Find a Formula for a Geometric Sequence
9.3.3 Find the Sum of a Geometric Sequence
9.3.4 Determine whether a Geometric Series Converges or Diverges
9.3.5 Solve Annuity Problems
9.5.1 Evaluate a Binomial Coefficient
9.5.2 Use the Binomial Theorem
10.1.1 Find All Subsets of a Set
10.1.2 Count the Number of Elements in a Set
10.1.3 Solve Counting Problems Using the Multiplication Principle
10.2.1 Solve Counting Problems Using Permutations Involving \( n \) Distinct Objects
10.2.2 Solve Counting Problems Using Combinations
10.2.3 Solve Counting Problems Using Permutations Involving \( n \) Nondistinct Objects
10.3.1 Construct Probability Models
10.3.2 Compute Probabilities of Equally Likely Outcomes
10.3.3 Find Probabilities of the Union of Two Events
10.3.4 Use the Complement Rule to Find Probabilities