

PREPARATION GUIDE FOR ALGEBRA COMPETENCY TEST

One way you can fulfill the algebra competency component of Franklin University's General Education Mathematics Requirement is to pass the Algebra Competency Test. The Algebra Competency Test consists of 22 multiple-choice questions. To pass the test, you must answer at least 16 of the questions correctly. You have two hours in which to take the test, and you may use a calculator.

The questions on the test address topics generally taught in high school Algebra 2. The topics include:

- Applying the properties of real numbers (especially, commutative, associative, distributive, identity)
- Simplifying algebraic expressions (including expressions with exponents, radicals, and absolute values)
- Solving and graphing linear equations and inequalities
- Solving formulas for specific variables
- Applying the rules of exponents (including rewriting expressions with negative exponents using positive exponents and applying rational exponents)
- Simplifying polynomials (adding, subtracting, multiplying, dividing)
- Factoring polynomials
- Solving quadratic equations
- Simplifying, adding, subtracting, multiplying, and dividing rational expressions
- Solving rational equations
- Solving application problems involving rational equations
- Applying the definition of function
- Identifying the domain and range of specific functions
- Evaluating functions at particular values
- Identifying the slope and y-intercept in linear equations
- Writing the equation of a line given a point and the slope or two points
- Solving systems of linear equations in two and three variables
- Solving absolute value equations and inequalities
- Solving systems of linear inequalities
- Solving radical equations
- Solving quadratic and rational inequalities

To aid you in your preparation, the following chart refers to the relevant sections in the textbook and a set of video lectures provided by the textbook publisher.

Textbook: Bittinger, Marvin L., and Beecher, Judith A. (2007). *Introductory and Intermediate Algebra: A Combined Approach*. Boston, MA: Addison-Wesley. ISBN: 0-321-31909-5.

Additional resources:

- Bittinger, Marvin. *Student's Solutions Manual*. Addison-Wesley. ISBN: 0-321-30591-4.
- Bittinger, Marvin L., and Beecher, Judith A. (2007). *Digital Video Tutor with Optional Captioning, 3rd Edition*. Addison-Wesley. ISBN-10: 0-321-30593-0

Topic	Study the following sections in the textbook	<u>OR</u> Watch this CD
Applying the properties of real numbers (especially, commutative, associative, distributive, identity)	Chapter 1, <i>Introduction to Real Numbers and Algebraic Expressions</i> , section 1.7, pages 53-65	CD 1
Simplifying algebraic expressions (including expressions with exponents, radicals, and absolute values)	Chapter 1, <i>Introduction to Real Numbers and Algebraic Expressions</i> , section 1.8, pages 66-75	CD 1
Solving and graphing linear equations and inequalities	Chapter 2, <i>Solving Equations and Inequalities</i> , sections 2.1-2.8, pages 82-159	CD 2
Solving formulas for specific variables	Chapter 2, <i>Solving Equations and Inequalities</i> , section 2.6, pages 106-113	CD 2
Applying the rules of exponents (including rewriting expressions with negative exponents using positive exponents and applying rational exponents)	Chapter 4, <i>Polynomials: Operations</i> , sections 4.1 and 4.2, pages 222-244	CD 4
Simplifying polynomials (adding, subtracting, multiplying, dividing; division by a monomial only)	Chapter 4, <i>Polynomials: Operations</i> , sections 4.3 through 4.8, pages 245-301	CD 4
Factoring polynomials	Chapter 5, <i>Polynomials: Factoring</i> , sections 5.1 through 5.5 and 5.7, pages 308-351 and 357-365	CD 5

Solving quadratic equations	Chapter 5, <i>Polynomials: Factoring</i> , section 5.8, pages 366-374; Chapter 11, <i>Quadratic Equations and Functions</i> , section 11.2, pages 768-775	CDs 5 and 11
Simplifying, adding, subtracting, multiplying, and dividing rational expressions	Chapter 6, <i>Rational Expressions and Equations</i> , sections 6.1 through 6.5, pages 394-429	CD 6
Solving rational equations	Chapter 6, <i>Rational Expressions and Equations</i> , section 6.7, pages 436-445	CD 6
Solving application problems involving rational equations	Chapter 6, <i>Rational Expressions and Equations</i> , section 6.8, pages 446-461	CD 6
Applying the definition of function	Chapter 7, <i>Graphs, Functions, and Applications</i> , section 7.1, pages 482-496	CD 7
Identifying the domain and range of specific functions	Chapter 7, <i>Graphs, Functions, and Applications</i> , sections 7.1 and 7.2, pages 482-501	CD 7
Evaluating functions at particular values	Chapter 7, <i>Graphs, Functions, and Applications</i> , section 7.1, pages 482-496	CD 7
Identifying the slope and y-intercept in linear equations	Chapter 7, <i>Graphs, Functions, and Applications</i> , section 7.3, pages 502-512	CD 7
Writing the equation of a line given a point and the slope or two points	Chapter 7, <i>Graphs, Functions, and Applications</i> , section 7.5, pages 526-539	CD 7
Solving systems of linear equations in two and three variables	Chapter 8, <i>Systems of Equations</i> , sections 8.1 through 8.5, pages 548-593	CD 8
Solving absolute value equations and inequalities	Chapter 9, <i>More on Inequalities</i> , section 9.3, pages 642-652	CD 9
Solving systems of linear inequalities	Chapter 9, <i>More on Inequalities</i> , section 9.4, pages 653-661	CD 9
Solving radical equations	Chapter 10, <i>Radical Expressions, Equations, and Functions</i> , section 10.6, pages 717-728	CD 10
Solving quadratic and rational inequalities	Chapter 11, <i>Quadratic Equations and Functions</i> , section 11.8, pages 832-839	CD 11