



# INTERMEDIATE ALGEBRA

COURSE OUTLINE





This course is designed to be flexible. Your student may start at any time and work at whatever pace is comfortable for them. **Please use this document in combination with the Course Calendar for planning purposes.** The calendar can be adjusted to make the course slower or faster, as desired by you and your student. There are four main elements to this course:

### Step 1

Students watch the video lesson for that day and take notes as they would if they were in class.

### Step 2

Students do the suggested homework exercises listed on each lesson page. The homework is done out of the free online OpenStax Intermediate Algebra textbook ([www.openstax.org](http://www.openstax.org)). Students can check their answers on the homework problems in the answer key of the OpenStax book. If they have questions, they can reference the homework support videos posted on the lesson page.

### Step 3

At the end of the chapter, students study for the test by doing the assigned review exercises out of the OpenStax book. They may check their answers in the answer key of the book.

### Step 4

When students are ready, they do the assigned exercises on the Practice Test provided in the OpenStax book. Students, or parents, can then grade the test using the “Practice Test Answer Keys” posted on the Courses Homepage.

The rest of this document lists the course topics, homework exercises, review exercises, and test exercises in detail.





## COURSE OVERVIEW

### Chapter 1 – Foundations

- 1.1 Use the Language of Algebra
- 1.2 Integers
- 1.3 Fractions
- 1.4 Decimals
- 1.5 Properties of Real Numbers

### Chapter 2 – Solving Linear Equations

- 2.1 Use a General Strategy to Solve Linear Equations
- 2.2 Use a Problem-Solving Strategy
- 2.3 Solve a Formula for a Specific Variable
- 2.4 Solve Mixture and Uniform Motion Applications
- 2.5 Solve Linear Inequalities
- 2.6 Solve Compound Inequalities
- 2.7 Solve Absolute Value Inequalities

### Chapter 3 – Graphs and Functions

- 3.1 Graph Linear Equations in Two Variables
- 3.2 Slope of a Line
- 3.3 Find the Equation of a Line
- 3.4 Graph Linear Inequalities in Two Variables
- 3.5 Relations and Functions
- 3.6 Graphs of Functions

### Chapter 4 – Systems of Linear Equations

- 4.1 Solve Systems of Linear Equations with Two Variables
- 4.2 Solve Applications with Systems of Equations
- 4.3 Solve Mixture Applications with Systems of Equations
- 4.4 Solve Systems of Equations with Three Variables
- 4.5 Solve Systems of Equations Using Matrices
- 4.6 Solve Systems of Equations Using Determinants
- 4.7 Graphing Systems of Linear Inequalities

### Chapter 5 – Polynomials and Polynomial Functions

- 5.1 Add and Subtract Polynomials
- 5.2 Properties of Exponents and Scientific Notation
- 5.3 Multiply Polynomials
- 5.4 Dividing Polynomials



**Chapter 6 – Factoring**

- 6.1 Greatest Common Factor and Factor by Grouping
- 6.2 Factoring Trinomials
- 6.3 Factor Special Products
- 6.4 General Strategy for Factoring Polynomials
- 6.5 Polynomial Equations

**Chapter 7 – Rational Expressions and Functions**

- 7.1 Multiply and Divide Rational Expressions
- 7.2 Add and Subtract Rational Expressions
- 7.3 Simplify Complex Rational Expressions
- 7.4 Solve Rational Equations
- 7.5 Solve Applications with Rational Equations
- 7.6 Solve Rational Inequalities

**Chapter 8 – Roots and Radicals**

- 8.1 Simplify Expressions with Roots
- 8.2 Simplify Radical Expressions
- 8.3 Simplify Rational Exponents
- 8.4 Add, Subtract, and Multiply Radical Expressions
- 8.5 Divide Radical Expressions
- 8.6 Solve Radical Equations
- 8.7 Use Radical in Functions
- 8.8 Use the Complex Number System

**Chapter 9 – Quadratic Equations and Functions**

- 9.1 Solve Quadratic Equations Using the Square Root Property
- 9.2 Solve Quadratic Equations by Completing the Square
- 9.3 Solve Quadratic Equations Using the Quadratic Formula
- 9.4 Solve Quadratic Equations in Quadratic Form
- 9.5 Solve Applications of Quadratic Equations
- 9.6 Graph Quadratic Functions Using Properties
- 9.7 Graph Quadratic Functions Using Transformations
- 9.8 Solve Quadratic Inequalities

**Chapter 10 – Exponential and Logarithmic Functions**

- 10.1 Finding Composite and Inverse Functions
- 10.2 Evaluate and Graph Exponential Functions
- 10.3 Evaluate and Graph Logarithmic Functions
- 10.4 Use the Properties of Logarithms
- 10.5 Solve Exponential and Logarithmic Functions



**Chapter 11 – Conics**

- 11.0 Introduction to Conic Sections
- 11.1 Distance and Midpoint Formulas; Circles
- 11.2 Parabolas
- 11.3 Ellipses
- 11.4 Hyperbolas
- 11.5 Solve Systems of Nonlinear Equations

**Chapter 12 – Sequences, Series, and the Binomial Theorem**

- 12.1 Sequences
- 12.2 Arithmetic Sequences
- 12.3 Geometric Sequences and Series
- 12.4 The Binomial Theorem





## CHAPTER 1 - FOUNDATIONS

### 1.1 Use the Language of Algebra (Part 1)

Topics:

- A. Find factors, prime factorizations, and least common multiples (LCM) (7 – 17 odd)
- B. Simplify expressions using order of operations (19 – 29 odd)

**Suggested Homework Exercises: 7 – 29 odd**

### 1.1 Use the Language of Algebra (Part 2)

Topics:

- C. Evaluate an expression (31 – 35 odd)
- D. Identify and combine like terms (37 – 41 odd)
- E. Translate words to math notation (43 – 53 odd)

**Suggested Homework Exercises: 31 – 53 odd**

### 1.2 Integers

Topics:

- A. Simplify expressions with absolute value (59 – 69 odd)
- B. Operations with integers (71 – 97 odd)
- C. Evaluate variable expressions with integers (99 – 125 odd)
- D. Use integers in applications (127 – 137 odd)

**Suggested Homework Exercises: 59 – 137 odd**

### 1.3 Fractions (Part 1)

Topics:

- A. Simplify fractions (143 – 149 odd)
- B. Multiply and divide fractions (151 – 171 odd)

**Suggested Homework Exercises: 143 – 171 odd**

### 1.3 Fractions (Part 2)

Topics:

- C. Add and subtract fractions (173 – 191 odd)
- D. Use order of operations to simplify fractions (193 – 227 odd)
- E. Evaluate variable expressions with fractions (229 – 233 odd)

**Suggested Homework Exercises: 173 – 233 odd**

### 1.4 Decimals

Topics:

- A. Operations with decimals (239 – 273 odd)
- B. Convert decimals, fractions, and percents (275 – 289 odd)
- C. Simplify expressions with square roots (291 – 295 odd)
- D. Sets within the real number system (297 – 307 odd)

**Suggested Homework Exercises: 239 – 307 odd**





## 1.5 Properties of Real Numbers

Topics:

- A. Commutative and Associative Properties (313 – 327 odd)
- B. The Properties of Identity, Inverse, and Zero (329 – 341 odd)
- C. The Distributive Property (343 – 379 odd)

**Suggested Homework Exercises: 313 – 379 odd**

### **SUGGESTED REVIEW:** Chapter 1 Review Exercises

**Day One of review do review exercises: 385 – 429 odd**

**Day Two of review do review exercises: 431 – 465 odd**

### **SUGGESTED ASSESSMENT:** Chapter 1 Practice Test

**Suggested Test: Do all exercises 466 – 495 on the Chapter 1 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

## CHAPTER 2 – SOLVING LINEAR EQUATIONS

### 2.1 Use a General Strategy to Solve Linear Equations (Part 1)

Topics:

- A. Properties of equality (1, 3)
- B. Solving linear equations (5 – 29 odd)

**Suggested Homework Exercises: 1 – 29 odd**

### 2.1 Use a General Strategy to Solve Linear Equations (Part 2)

Topics:

- C. Special cases - three solution types (31 – 41 odd)
- D. Solve linear equations with fractions or decimals (43 – 71 odd)

**Suggested Homework Exercises: 31 – 71 odd**

### 2.2 Use a Problem-Solving Strategy (Part 1)

Topics:

- A. Solve number word problems (81 – 115 odd)
- B. Solve percent problems (117 - 129 odd)

**Suggested Homework Exercises: 81 – 129 odd**

### 2.2 Use a Problem-Solving Strategy (Part 2)

Topics:

- C. Solve percent change problems (131 – 141 odd)
- D. Solve discount and markup problems (143, 145)
- E. Solve simple interest applications (147 – 157 odd)

**Suggested Homework Exercises: 131 – 157 odd**





### 2.3 Solve a Formula for a Specific Variable

Topics:

- A. Solve a formula for a specific variable (165 – 193 odd)
- B. Use formulas to solve geometry applications (195 – 233 odd)

**Suggested Homework Exercises: 165 – 233 odd**

### 2.4 Solve Mixture and Uniform Motion Applications (Part 1)

Topics:

- A. Solve coin word problems (243 – 249 odd)
- B. Solve ticket and stamp word problems (251 – 259 odd)

**Suggested Homework Exercises: 243 – 259 odd**

### 2.4 Solve Mixture and Uniform Motion Applications (Part 2)

Topics:

- C. Solve mixture word problems (261 – 267 odd)
- D. Solve uniform motion applications (269 – 289 odd)

**Suggested Homework Exercises: 261 – 289 odd**

### 2.5 Solve Linear Inequalities (Part 1)

Topics:

- A. Interval notation and graphing inequalities on a number line (297 – 303 odd)
- B. Solve linear inequalities (305 – 337 odd)

**Suggested Homework Exercises: 297 – 337 odd**

### 2.5 Solve Linear Inequalities (Part 2)

Topics:

- C. Solve applications with linear inequalities (339 – 367 odd)

**Suggested Homework Exercises: 339 – 367 odd**

### 2.6 Solve Compound Inequalities

Topics:

- A. Solve compound inequalities with the word “and” (377 – 401 odd)
- B. Solve compound inequalities with the word “or” (403 – 425 odd)
- C. Solve applications with compound inequalities (427, 429)

**Suggested Homework Exercises: 377 – 429 odd**

### 2.7 Solve Absolute Value Inequalities (Part 1)

Topics:

- A. Solve absolute value equations (435 – 455 odd)
- B. Solve absolute value inequalities with “less than” (457 – 467 odd)

**Suggested Homework Exercises: 435 – 467 odd**





## 2.7 Solve Absolute Value Inequalities (Part 2)

Topics:

C. Solve absolute value inequalities with “greater than” (469 – 479 odd)

D. Solve mixed practice problems (481 – 489 odd)

E. Solve applications with absolute value (491, 493)

**Suggested Homework Exercises: 469 – 493 odd**

### **SUGGESTED REVIEW:** Chapter 2 Review Exercises

**Day One of review do review exercises: 497 – 553 odd**

**Day Two of review do review exercises: 555 – 623 odd**

### **SUGGESTED ASSESSMENT:** Chapter 2 Practice Test

**Suggested Test: Do exercises 625 – 655 odd on the Chapter 2 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

## CHAPTER 3 – GRAPHS AND FUNCTIONS

### 3.1 Graph Linear Equations in Two Variables

Topics:

A. Plot points in the rectangular coordinate system (1 – 7 odd)

B. Graph by plotting points (9 – 23 odd)

C. Graph vertical and horizontal lines (25 – 31 odd)

D. Graph a line using the x and y-intercepts (33 – 67 odd)

**Suggested Homework Exercises: 1 – 67 odd**

### 3.2 Slope of a Line (Part 1)

Topics:

A. Find the slope of a line (73 – 91 odd)

B. Graph a line given a point and a slope (93 – 99 odd)

C. Graph a line using its slope and y-intercept (101 – 115 odd)

**Suggested Homework Exercises: 73 – 115 odd**

### 3.2 Slope of a Line (Part 2)

Topics:

D. Choose the most convenient method to graph a line (117 – 123 odd)

E. Graph and interpret applications of slope-intercept (125 – 131 odd)

F. Use slopes to identify parallel and perpendicular lines (133 – 149 odd)

**Suggested Homework Exercises: 117 – 149 odd**





### 3.3 Find the Equation of a Line

Topics:

- A. Find an equation of a line given the slope and y-intercept (155 – 169 odd)
- B. Find an equation of a line given the slope and a point (171 – 181 odd)
- C. Find an equation of a line given two points (183 – 193 odd)
- D. Find an equation of a line parallel to a given line (195 – 201 odd)
- E. Find an equation of a line perpendicular to a given line (203 – 233 odd)

**Suggested Homework Exercises: 155 – 233 odd**

### 3.4 Graph Linear Inequalities in Two Variables

Topics:

- A. Verify solutions to an inequality in two variables (237 – 241 odd)
- B. Recognize the relationship between the solutions of an inequality and its graph (243 – 249 odd)
- C. Graph linear inequalities (251 – 275 odd)
- D. Solve applications using linear inequalities in two variables (277, 279)

**Suggested Homework Exercises: 237 – 279 odd**

### 3.5 Relations and Functions

Topics:

- A. Find the domain and range of a relation (283 – 293 odd)
- B. Determine if a relation is a function (295 – 305 odd)
- C. Find the value of a function (307 – 327 odd)
- D. Applications involving functions (329, 331)

**Suggested Homework Exercises: 283 – 331 odd**

### 3.6 Graphs of Functions (Part 1)

\* Note: Topics for this section are presented in the reverse order in which they are presented in the OpenStax textbook.

Topics:

- A. Read information from the graph of a function (377 – 385 odd)

**Suggested Homework Exercises: 377 – 385 odd**

### 3.6 Graphs of Functions (Part 2)

Topics:

- B. The vertical line test (337, 339)
- C. Identify graphs of basic functions (341 – 375 odd)

**Suggested Homework Exercises: 337 – 375 odd**

### **SUGGESTED REVIEW:** Chapter 3 Review Exercises

**Day One of review do review exercises: 391 – 477 odd**

**Day Two of review do review exercises: 479 – 535 odd**



**SUGGESTED ASSESSMENT: Chapter 3 Practice Test**

**Suggested Test: Do exercises 537 – 561 odd on the Chapter 3 Practice Test**  
\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

**CHAPTER 4 – SYSTEMS OF LINEAR EQUATIONS****4.1 Solve Systems of Linear Equations with Two Variables (Part 1)**

Topics:

- A. Determine whether an ordered pair is a solution to a system of equations (1, 3)
- B. Solve a system of equations by graphing (5 – 29 odd)
- C. Solve a system of equations by substitution (31 – 45 odd)

**Suggested Homework Exercises: 1 – 45 odd**

**4.1 Solve Systems of Linear Equations with Two Variables (Part 2)**

Topics:

- D. Solve a system of equations by elimination (47 – 63 odd)
- E. Choose the most convenient method to solve a system of equations (65, 67)

**Suggested Homework Exercises: 47 – 67 odd**

**4.2 Solve Applications with Systems of Equations (Part 1)**

Topics:

- A. Solve direct translation applications (73 – 95 odd)
- B. Solve geometry applications (97 – 111 odd)

**Suggested Homework Exercises: 73 – 111 odd**

**4.2 Solve Applications with Systems of Equations (Part 2)**

Topics:

- C. Solve uniform motion applications (113 – 123 odd)

**Suggested Homework Exercises: 113 – 123 odd**

**4.3 Solve Mixture Applications with Systems of Equations (Part 1)**

Topics:

- A. Solve mixture applications (127 – 149 odd)

**Suggested Homework Exercises: 127 – 149 odd**

**4.3 Solve Mixture Applications with Systems of Equations (Part 2)**

Topics:

- B. Solve interest applications (151 – 157 odd)
- C. Solve applications of cost and revenue functions (159)

**Suggested Homework Exercises: 151 – 159 odd**





#### 4.4 Solve Systems of Equations with Three Variables (Part 1)

Topics:

A. Determine whether an ordered triple is a solution to a system of three equations in three variables (163, 165)

B. Solve a system of linear equations in three variables (167 – 181 odd)

**Suggested Homework Exercises: 163 – 181 odd**

#### 4.4 Solve Systems of Equations with Three Variables (Part 2)

Topics:

B. Solve a system of linear equations in three variables (continued) (183 – 189 odd)

C. Solve applications using systems of linear equations with three variables (191, 193)

**Suggested Homework Exercises: 183 – 193 odd**

#### 4.5 Solve Systems of Equations Using Matrices

Topics:

A. Write the augmented matrix for a system of equations (197 – 203 odd)

B. Use row operations on a matrix (205 – 209 odd)

C. Solve systems of equations using matrices (211 – 229 odd)

**Suggested Homework Exercises: 197 – 229 odd**

#### 4.6 Solve Systems of Equations Using Determinants (Part 1)

Topics:

A. Evaluate the determinant of a 2 X 2 matrix (233, 235)

B. Evaluate the determinant of a 3 X 3 matrix (237 – 247 odd)

C. Use Cramer's Rule to solve systems of two equations (249 – 255 odd)

**Suggested Homework Exercises: 233 – 255 odd**

#### 4.6 Solve Systems of Equations Using Determinants (Part 2)

Topics:

D. Use Cramer's Rule to solve systems of three equations (257 – 271 odd)

E. Solve applications using determinants (273, 275)

**Suggested Homework Exercises: 257 – 275 odd**

#### 4.7 Graphing Systems of Linear Inequalities

Topics:

A. Determine whether an ordered pair is a solution to a system of linear inequalities (281 – 285 odd)

B. Solve a system of linear inequalities by graphing (287 – 317 odd)

C. Solve applications of systems of inequalities (319 – 325 odd)

**Suggested Homework Exercises: 281 – 325 odd**

#### **SUGGESTED REVIEW:** Chapter 4 Review Exercises

**Day One of review do review exercises: 329 – 375 odd**

**Day Two of review do review exercises: 377 – 405 odd**



**SUGGESTED ASSESSMENT: Chapter 4 Practice Test**

**Suggested Test: Do all exercises 407 – 421 on the Chapter 4 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

**CHAPTER 5 – POLYNOMIALS AND POLYNOMIAL FUNCTIONS****5.1 Add and Subtract Polynomials**

Topics:

- A. Determine the degree of polynomials (1 – 7 odd)
- B. Add and subtract polynomials (9 – 61 odd)
- C. Evaluate a polynomial function for a given value (63 – 71 odd)
- D. Add and subtract polynomial functions (73, 75)

**Suggested Homework Exercises: 1 – 75 odd**

**5.2 Properties of Exponents and Scientific Notation**

Topics:

- A. Simplify expressions using the properties of exponents (81 – 161 odd)
- B. Use scientific notation (163 – 173 odd)

**Suggested Homework Exercises: 81 – 173 odd**

**5.3 Multiply Polynomials**

Topics:

- A. Multiply monomials (179, 181)
- B. Multiply a polynomial by a monomial (183, 185)
- C. Multiply binomials (187 – 205 odd)
- D. Multiply a polynomial by a polynomial (207 – 277 odd)
- E. Multiply polynomial functions (279 – 283 odd)

**Suggested Homework Exercises: 179 – 283 odd**

**5.4 Dividing Polynomials (Part 1)**

Topics:

- A. Dividing monomials (289 – 295 odd)
- B. Dividing a polynomial by a monomial (297 – 303 odd)
- C. Dividing polynomials using long division (305 – 315 odd)

**Suggested Homework Exercises: 289 – 315 odd**

**5.4 Dividing Polynomials (Part 2)**

Topics:

- D. Dividing polynomials using synthetic division (317 – 323 odd)
- E. Dividing polynomial functions (325 – 329 odd)
- F. Use the remainder and factor theorems (331 – 337 odd)

**Suggested Homework Exercises: 317 – 337 odd**



**SUGGESTED REVIEW: Chapter 5 Review Exercises**

Day One of review do review exercises: 343 – 437 odd

Day Two of review do review exercises: 439 – 485 odd

**SUGGESTED ASSESSMENT: Chapter 5 Practice Test**

**Suggested Test: Do all exercises 487 – 516 on the Chapter 5 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

## CHAPTER 6 – FACTORING

### 6.1 Greatest Common Factor and Factor by Grouping

Topics:

A. Find the greatest common factor (GCF) of two or more expressions (1 – 7 odd)

B. Factor the greatest common factor from a polynomial (9 – 35 odd)

C. Factor by grouping (37 – 55 odd)

**Suggested Homework Exercises: 1 – 55 odd**

### 6.2 Factoring Trinomials (Part 1)

Topics:

A. Factor trinomials of the form  $x^2 + bx + c$  using trial and error (61 – 87 odd)

B. Factor trinomials of the form  $ax^2 + bx + c$  using trial and error (89 – 109 odd)

**Suggested Homework Exercises: 61 – 109 odd**

### 6.2 Factoring Trinomials (Part 2)

Topics:

C. Factor trinomials using the AC method (111 – 125 odd)

D. Factor using substitution (127 – 153 odd)

**Suggested Homework Exercises: 111 – 153 odd**

### 6.3 Factor Special Products (Part 1)

Topics:

A. Factor perfect square trinomials (159 – 173 odd)

B. Factor difference of squares (175 – 193 odd)

**Suggested Homework Exercises: 159 – 193 odd**

### 6.3 Factor Special Products (Part 2)

Topics:

C. Factor sums and differences of cubes (195 – 227 odd)

**Suggested Homework Exercises: 195 – 227 odd**





#### 6.4 General Strategy for Factoring Polynomials

Topics:

A. Recognize and use the appropriate method to factor a polynomial completely (233 – 271 odd)

**Suggested Homework Exercises: 233 – 271 odd**

#### 6.5 Polynomial Equations (Part 1)

Topics:

A. Use the Zero Product Property (277 – 281 odd)

B. Solve quadratic equations by factoring (283 – 311 odd)

C. Solve equations with polynomial functions (313 – 319 odd)

**Suggested Homework Exercises: 277 – 319 odd**

#### 6.5 Polynomial Equations (Part 2)

Topics:

D. Solve applications modeled by polynomial equations (321 – 333 odd)

**Suggested Homework Exercises: 321 – 333 odd**

#### **SUGGESTED REVIEW:** Chapter 6 Review Exercises

Day One of review do review exercises: 337 – 381 odd

Day Two of review do review exercises: 383 – 443 odd

#### **SUGGESTED ASSESSMENT:** Chapter 6 Practice Test

**Suggested Test: Do all exercises 445 – 464 on the Chapter 6 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

## CHAPTER 7 – RATIONAL EXPRESSIONS AND FUNCTIONS

#### 7.1 Multiply and Divide Rational Expressions

Topics:

A. Determine the values for which the rational expression is undefined (1, 3)

B. Simplify rational expressions (5 – 27 odd)

C. Multiply rational expressions (29 – 41 odd)

D. Divide rational expressions (43 – 57 odd)

E. Multiply and divide rational functions (59 – 69 odd)

**Suggested Homework Exercises: 1 – 69 odd**

#### 7.2 Add and Subtract Rational Expressions (Part 1)

Topics:

A. Add and subtract expressions with a common denominator (75 – 89 odd)

B. Add and subtract expressions whose denominators are opposites (91 – 97 odd)

C. Find the least common denominator (LCD) of rational expressions (99 – 105 odd)

**Suggested Homework Exercises: 75 – 105 odd**





## 7.2 Add and Subtract Rational Expressions (Part 2)

Topics:

D. Add and subtract rational expressions with unlike denominators (107 – 141 odd)

E. Add and subtract rational functions (143, 145)

**Suggested Homework Exercises: 107 – 145 odd**

## 7.3 Simplify Complex Rational Expressions

Topics:

A. Simplify a complex rational expression by writing it as a division (151 – 165 odd)

B. Simplify a complex rational expression by using the LCD (167 – 193 odd)

**Suggested Homework Exercises: 151 – 193 odd**

## 7.4 Solve Rational Equations (Part 1)

Topics:

A. Solve rational equations (197 – 229 odd)

**Suggested Homework Exercises: 197 – 229 odd**

## 7.4 Solve Rational Equations (Part 2)

Topics:

B. Use rational functions (231, 233)

C. Solve a rational equation for a specific variable (235 – 249 odd)

**Suggested Homework Exercises: 231 – 249 odd**

## 7.5 Solve Applications with Rational Equations (Part 1)

Topics:

A. Solve proportions (253 – 273 odd)

B. Solve similar figure applications (275 – 283 odd)

C. Solve uniform motion applications (285 – 303 odd)

**Suggested Homework Exercises: 253 – 303 odd**

## 7.5 Solve Applications with Rational Equations (Part 2)

Topics:

D. Solve work applications (305 – 311 odd)

E. Solve direct variation problems (313 – 321 odd)

F. Solve inverse variation problems (323 – 333 odd)

**Suggested Homework Exercises: 305 – 333 odd**

## 7.6 Solve Rational Inequalities

Topics:

A. Solve rational inequalities (339 – 369 odd)

B. Solve an inequality with rational functions (371, 373)

**Suggested Homework Exercises: 339 – 373 odd**

### **SUGGESTED REVIEW:** Chapter 7 Review Exercises

Day One of review do review exercises: 377 – 421 odd

Day Two of review do review exercises: 423 – 481 odd



**SUGGESTED ASSESSMENT: Chapter 7 Practice Test**

**Suggested Test: Do all exercises 483 – 507 on the Chapter 7 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

**CHAPTER 8 – ROOTS AND RADICALS****8.1 Simplify Expressions with Roots**

Topics:

- A. Simplify expressions with roots (1 – 17 odd)
- B. Estimate and approximate roots (19 – 25 odd)
- C. Simplify variable expressions with roots (27 – 49 odd)

**Suggested Homework Exercises: 1 – 49 odd**

**8.2 Simplify Radical Expressions**

Topics:

- A. Use the Product Property to simplify radical expressions (55 – 85 odd)
- B. Use the Quotient Property to simplify radical expressions (87 – 113 odd)

**Suggested Homework Exercises: 55 – 113 odd**

**8.3 Simplify Rational Exponents**

Topics:

- A. Simplify expressions with  $a^{1/n}$  (119 – 139 odd)
- B. Simplify expressions with  $a^{m/n}$  (141 – 149 odd)
- C. Use the properties of exponents to simplify expressions with rational exponents (151 – 161 odd)

**Suggested Homework Exercises: 119 – 161 odd**

**8.4 Add, Subtract, and Multiply Radical Expressions**

Topics:

- A. Add and subtract radical expressions (165 – 181 odd)
- B. Multiply radical expressions (183 – 189 odd)
- C. Use polynomial multiplication to multiply radical expressions (191 – 239 odd)

**Suggested Homework Exercises: 165 – 239 odd**

**8.5 Divide Radical Expressions**

Topics:

- A. Divide radical expressions (245 – 257 odd)
- B. Rationalize a one term denominator (259 – 269 odd)
- C. Rationalize a two term denominator (271 – 281 odd)

**Suggested Homework Exercises: 245 – 281 odd**





## 8.6 Solve Radical Equations

Topics:

- A. Solve radical equations with one radical (287 – 321 odd)
- B. Solve radical equations with two radicals (323 – 341 odd)
- C. Use radicals in applications (343 – 347 odd)

**Suggested Homework Exercises: 287 – 347 odd**

## 8.7 Use Radical in Functions

Topics:

- A. Evaluate a radical function (351 – 365 odd)
- B. Find the domain of a radical function (367 – 381 odd)
- C. Graph radical functions (383 – 403 odd)

**Suggested Homework Exercises: 351 – 403 odd**

## 8.8 Use the Complex Number System

Topics:

- A. Evaluate the square root of a negative number (409, 411)
- B. Add and subtract complex numbers (413 – 427 odd)
- C. Multiply complex numbers (429 – 455 odd)
- D. Divide complex numbers (457 – 467 odd)
- E. Simplify powers of  $i$  (469 – 475 odd)

**Suggested Homework Exercises: 409 – 475 odd**

### **SUGGESTED REVIEW:** Chapter 8 Review Exercises

**Day One of review do review exercises: 481 – 537 odd**

**Day Two of review do review exercises: 539 – 577 odd**

### **SUGGESTED ASSESSMENT:** Chapter 8 Practice Test

**Suggested Test: Do all exercises 579 – 603 on the Chapter 8 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

## CHAPTER 9 – QUADRATIC EQUATIONS AND FUNCTIONS

### 9.1 Solve Quadratic Equations Using the Square Root Property

Topics:

- A. Solve quadratic equations of the form  $ax^2 = k$  (1 – 21 odd)
- B. Solve quadratic equations of the form  $a(x - h)^2 = k$  (23 – 67 odd)

**Suggested Homework Exercises: 1 – 67 odd**





## 9.2 Solve Quadratic Equations by Completing the Square

Topics:

- A. Solve quadratic equations of the form  $x^2 + bx + c = 0$  by completing the square (71 -97 odd)
- B. Solve quadratic equations of the form  $ax^2 + bx + c = 0$  by completing the square (99 – 109 odd)

**Suggested Homework Exercises: 71 – 109 odd**

## 9.3 Solve Quadratic Equations Using the Quadratic Formula

Topics:

- A. Solve quadratic equations using the Quadratic Formula (113 – 143 odd)
- B. Use the discriminant to determine the number and type of solutions of a quadratic equation (145, 147)
- C. Identify the most appropriate method to use to solve a quadratic equation (149, 151)

**Suggested Homework Exercises: 113 – 151 odd**

## 9.4 Solve Quadratic Equations in Quadratic Form

Topics:

- A. Solve equations in quadratic form (155 – 191 odd)

**Suggested Homework Exercises: 155 – 191 odd**

## 9.5 Solve Applications of Quadratic Equations

Topics:

- A. Solve applications modeled by quadratic equations (195 – 225 odd)

**Suggested Homework Exercises: 195 – 225 odd**

## 9.6 Graph Quadratic Functions Using Properties (Part 1)

Topics:

- A. Recognize the graph of a quadratic function (229 – 235 odd)
- B. Identify the properties of a quadratic function (237 – 251 odd)

**Suggested Homework Exercises: 229 – 251 odd**

## 9.6 Graph Quadratic Functions Using Properties (Part 2)

Topics:

- C. Graph quadratic functions using properties (253 – 269 odd)
- D. Solve maximum and minimum applications (271 – 287 odd)

**Suggested Homework Exercises: 253 – 287 odd**

## 9.7 Graph Quadratic Functions Using Transformations (Part 1)

Topics:

- A. Graph quadratic functions of the form  $f(x) = x^2 + k$  (293 – 299 odd)
- B. Graph quadratic functions of the form  $f(x) = (x - h)^2$  (301 – 315 odd)
- C. Graph quadratic functions of the form  $f(x) = ax^2$  (317 – 323 odd)

**Suggested Homework Exercises: 293 – 323 odd**





### 9.7 Graph Quadratic Functions Using Transformations (Part 2)

Topics:

D. Rewrite a function of the form  $f(x) = ax^2 + bx + c$  into the form  $f(x) = a(x - h)^2 + k$  (325, 327)

E. Graph quadratic functions using transformations (329 – 347 odd)

F. Find a quadratic function from its graph (349 – 359 odd)

**Suggested Homework Exercises: 325 – 359 odd**

### 9.8 Solve Quadratic Inequalities

Topics:

A. Solve quadratic inequalities graphically (363 – 369 odd)

B. Solve quadratic inequalities algebraically (371 – 389 odd)

**Suggested Homework Exercises: 363 – 389 odd**

### **SUGGESTED REVIEW:** Chapter 9 Review Exercises

Day One of review do review exercises: 395 – 463 odd

Day Two of review do review exercises: 465 – 527 odd

### **SUGGESTED ASSESSMENT:** Chapter 9 Practice Test

**Suggested Test: Do all exercises 579 – 603 on the Chapter 9 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

## CHAPTER 10 – EXPONENTIAL AND LOGARITHMIC FUNCTIONS

### 10.1 Finding Composite and Inverse Functions

Topics:

A. Find and evaluate composite functions (1 – 11 odd)

B. Determine whether a function is one-to-one (13 – 19 odd)

C. Find the inverse of a function (21 – 61 odd)

**Suggested Homework Exercises: 1 – 61 odd**

### 10.2 Evaluate and Graph Exponential Functions

Topics:

A. Graph exponential functions (65 – 83 odd)

B. Solve exponential equations (85 – 113 odd)

C. Use exponential models in applications (115 – 121 odd)

**Suggested Homework Exercises: 65 – 121 odd**





### 10.3 Evaluate and Graph Logarithmic Functions

Topics:

- A. Convert between exponential and logarithmic form (127 – 153 odd)
- B. Graph logarithmic functions (179 – 187 odd)
- C. Evaluate logarithmic functions (155 – 177 odd)
- D. Solve logarithmic equations (189 – 207 odd)
- E. Use logarithmic models in applications (209 – 213 odd)

**Suggested Homework Exercises: 127 – 213 odd**

### 10.4 Use the Properties of Logarithms

Topics:

- A. Use the properties of logarithms (219 – 277 odd)
- B. Use the change of base formula (279 – 283 odd)

**Suggested Homework Exercises: 219 – 283 odd**

### 10.5 Solve Exponential and Logarithmic Functions (Part 1)

Topics:

- A. Solve logarithmic equations using the properties of logs (289 – 305 odd)
- B. Solve exponential equations using logs (307 – 343 odd)

**Suggested Homework Exercises: 289 – 343 odd**

### 10.5 Solve Exponential and Logarithmic Functions (Part 2)

Topics:

- C. Use exponential models in applications (345 – 353 odd)

**Suggested Homework Exercises: 345 – 353 odd**

### **SUGGESTED REVIEW:** Chapter 10 Review Exercises

**Day One of review do review exercises: 357 – 411 odd**

**Day Two of review do review exercises: 413 – 445 odd**

### **SUGGESTED ASSESSMENT:** Chapter 10 Practice Test

**Suggested Test: Do all exercises 447 – 476 on the Chapter 10 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.

## CHAPTER 11 – CONICS

### 11.0 Introduction to Conic Sections

Topics:

- A. Introduction to Conic Sections

**Suggested Homework Exercises: None**





### 11.1 Distance and Midpoint Formulas; Circles

Topics:

- A. Use the Distance Formula (1 – 11 odd)
- B. Use the Midpoint Formula (13, 15)
- C. Write the equation of a circle in standard form (17 – 27 odd)
- D. Graph a circle (29 – 47 odd)

**Suggested Homework Exercises: 1 – 47 odd**

### 11.2 Parabolas

Topics:

- A. Graph vertical parabolas (53 – 59 odd)
- B. Graph horizontal parabolas (61 – 89 odd)
- C. Solve applications with parabolas (91, 93)

**Suggested Homework Exercises: 53 – 93 odd**

### 11.3 Ellipses

Topics:

- A. Graph an ellipse with center at the origin (99 – 109 odd)
- B. Find the equation of an ellipse with center at the origin (111, 113)
- C. Graph an ellipse with center not at the origin (115 – 137 odd)
- D. Solve applications with ellipses (139, 141)

**Suggested Homework Exercises: 99 – 141 odd**

### 11.4 Hyperbolas

Topics:

- A. Graph a hyperbola with center at (0,0) (147 – 157 odd)
- B. Graph a hyperbola with center at (h,k) (159 – 173 odd)
- C. Identify conic sections by their equations (175 – 183 odd)

**Suggested Homework Exercises: 147 – 183 odd**

### 11.5 Solve Systems of Nonlinear Equations

Topics:

- A. Solve a system of nonlinear equations using graphing (189 – 199 odd)
- B. Solve a system of nonlinear equations using substitution (201 – 211 odd)
- C. Solve a system of nonlinear equations using elimination (213 – 227 odd)
- D. Use a system of nonlinear equations to solve applications (229 – 239 odd)

**Suggested Homework Exercises: 189 – 239 odd**

### **SUGGESTED REVIEW:** Chapter 11 Review Exercises

**Day One of review do review exercises: 245 – 281 odd**

**Day Two of review do review exercises: 283 – 325 odd**

### **SUGGESTED ASSESSMENT:** Chapter 11 Practice Test

**Suggested Test: Do exercises 327 – 351 odd on the Chapter 11 Practice Test**

\*Note: Grade your test using the Practice Test Answer Key posted on the course homepage.





## CHAPTER 12 – SEQUENCES, SERIES, AND THE BINOMIAL THEOREM

### 12.1 Sequences

Topics:

- A. Write the first few terms of a sequence (1 – 17 odd)
- B. Find a formula for the general term (nth term) of a sequence (19 – 35 odd)
- C. Use factorial notation (37 – 47 odd)
- D. Find the partial sum (49 – 59 odd)
- E. Use summation notation to write a sum (61 – 71 odd)

**Suggested Homework Exercises: 1 – 71 odd**

### 12.2 Arithmetic Sequences

Topics:

- A. Determine if a sequence is arithmetic (77 -87 odd)
- B. Find the general term (nth term) of an arithmetic sequence (89 – 105 odd)
- C. Find the sum of the first n terms of an arithmetic sequence (107 – 121 odd)

**Suggested Homework Exercises: 77 – 121 odd**

### 12.3 Geometric Sequences and Series

Topics:

- A. Determine if a sequence is geometric (127 – 143 odd)
- B. Find the general (nth term) of a geometric sequence (145 – 155 odd)
- C. Find the sum of the first n terms of a geometric sequence (157 – 167 odd)
- D. Find the sum of an infinite geometric series (169 – 181 odd)
- E. Apply geometric sequences and series in the real world (183, 185)

**Suggested Homework Exercises: 127 – 185 odd**

### 12.4 The Binomial Theorem

Topics:

- A. Use Pascal's Triangle to expand a binomial (193 – 209 odd)
- B. Evaluate a binomial coefficient (211, 213)
- C. Use the Binomial Theorem to expand a binomial (215 – 235 odd)

**Suggested Homework Exercises: 193 – 235 odd**

### **SUGGESTED REVIEW:** Chapter 12 Review Exercises

Day One of review do review exercises: 241 – 279 odd

Day Two of review do review exercises: 281 – 319 odd

### **SUGGESTED ASSESSMENT:** Chapter 12 Practice Test

Suggested Test: Do all exercises 320 – 344 odd on the Chapter 12 Practice Test

