



# Elementary Algebra

## Detailed Topics List with Suggested Homework and Assessments

### CHAPTER 1 - FOUNDATIONS

#### Section 1.1 – Introduction to Whole Numbers

Topics:

- A. Use place value with whole numbers
- B. Identify multiples and apply divisibility
- C. Find prime factorizations and least common multiples (LCM)

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

#### Section 1.2 – Use the Language of Algebra

Topics:

- A. Simplify expressions using order of operations
- B. Evaluate an expression
- C. Identify and combine like terms
- D. Translate an English phrase to an algebraic expression

**Suggested Homework Exercises: 83 – 177 odd**

#### Section 1.3 – Add and Subtract Integers

Topics:

- A. Use negatives and opposites
- B. Simplify expressions with absolute value
- C. Add integers
- D. Subtract integers

**Suggested Homework Exercises: 185 – 253 odd**

#### Section 1.4 – Multiply and Divide Integers

Topics:

- A. Multiply and divide integers
- B. Simplify expressions with integers
- C. Evaluate variable expressions with integers
- D. Translate English phrases to algebraic expressions
- E. Use integers in applications

**Suggested Homework Exercises: 265 – 335 odd**





### Section 1.5 – Visualize Fractions

Topics:

- A. Simplify fractions
- B. Multiply fractions
- C. Divide fractions
- D. Simplify expressions written with a fraction bar
- E. Translate phrases to expressions with fractions

**Suggested Homework Exercises: 343 – 415 odd**

### Section 1.6 – Add and Subtract Fractions

Topics:

- A. Add or subtract fractions with a common denominator
- B. Add or subtract fractions with different denominators
- C. Use order of operations to simplify complex fractions
- D. Evaluate variable expressions with fractions

**Suggested Homework Exercises: 425 – 525 odd**

### Section 1.7 – Decimals

Topics:

- A. Name and write decimals
- B. Round decimals
- C. Add and subtract decimals
- D. Multiply and divide decimals
- E. Convert decimals, fractions, and percents

**Suggested Homework Exercises: 531 – 647 odd**

### Section 1.8 – The Real Numbers

Topics:

- A. Simplify expressions with square roots
- B. Identify integers, rational numbers, irrational numbers, and real numbers
- C. Locate fractions on the number line
- D. Locate decimals on the number line

**Suggested Homework Exercises : 659 – 717 odd**

### Section 1.9 – Properties of Real Numbers

Topics:

- A. Use the commutative and associative properties
- B. Use the identity and inverse properties of addition and multiplication
- C. Use the properties of zero
- D. Simplify expressions using the distributive property

**Suggested Homework Exercises : 723 – 815 odd**





### **Section 1.10 – Systems of Measurement**

Topics:

- A. Perform unit conversions in the U.S. system
- B. Perform unit conversions in the metric system
- C. Convert between the U.S. and the metric systems of measurement
- D. Convert between Fahrenheit and Celsius temperatures

**Suggested Homework Exercises: 825 – 907 odd**

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

\*Note: Practice Test Answer Keys are posted on the video library homepage

## **CHAPTER 2 – SOLVING LINEAR EQUATIONS AND INEQUALITIES**

### **Section 2.1 – Solve Equations Using the Subtraction and Addition Properties of Equality**

Topics:

- A. Verify a solution of an equation
- B. Solve equations using the Subtraction and Addition Properties of Equality
- C. Translate to an equation and solve
- D. Translate and solve applications

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

### **Section 2.2 – Solve Equations Using the Division and Multiplication Properties of Equality**

Topics:

- A. Solve equations using the Division and Multiplication Properties of Equality
- B. Translate to an equation and solve
- C. Translate and solve applications

**Suggested Homework Exercises: 77 – 169 odd**

### **Section 2.3 – Solve Equations with Variables and Constants on Both Sides**

Topics:

- A. Solve an equation with constants on both sides
- B. Solve an equation with variables on both sides
- C. Solve an equation with variables and constants on both sides

**Suggested Homework Exercises: 175 – 225 odd**

### **Section 2.4 – Use a General Strategy to Solve Linear Equations**

Topics:

- A. Solve equations using a general strategy
- B. Classify equations

**Suggested Homework Exercises: 233 – 311 odd**



**Section 2.5 – Solve Equations with Fractions or Decimals**

Topics:

- A. Solve equations with fraction coefficients
- B. Solve equations with decimal coefficients

**Suggested Homework Exercises: 319 – 369 odd****Section 2.6 – Solve a Formula for a Specific Variable**

Topics:

- A. Use the Distance, Rate, and Time Formula
- B. Solve a formula for a specific variable

**Suggested Homework Exercises: 377 – 425 odd****Section 2.7 – Solve Linear Inequalities**

Topics:

- A. Graph inequalities on a number line
- B. Solve inequalities using properties and simplification
- C. Translate to an inequality and solve

**Suggested Homework Exercises: 431 – 503 odd****SUGGESTED ASSESSMENT: Chapter 2 Practice Test**

\*Note: Practice Test Answer Keys are posted on the video library homepage

**CHAPTER 3 – MATH MODELS****Section 3.1 – Use a Problem-Solving Strategy**

Topics:

- A. Use a problem-solving strategy for word problems
- B. Solve number problems

**Suggested Homework Exercises: 1 – 55 odd****Section 3.2 – Solve Percent Applications**

Topics:

- A. Translate and solve basic percent equations
- B. Solve percent applications
- C. Find percent increase and percent decrease
- D. Solve applications with discount or mark-up

**Suggested Homework Exercises: 67 – 153 odd****Section 3.3 – Solve Mixture Applications (Part 1)**

Topics:

- A. Solve coin word problems
- B. Solve ticket and stamp word problems

**Suggested Homework Exercises: 161 – 191 odd**



### **Section 3.3 – Solve Mixture Applications (Part 2)**

Topics:

- A. Solve mixture word problems
- B. Use the mixture model to solve investment problems using simple interest

**Suggested Homework Exercises: 193 – 203 odd**

### **Section 3.4 – Solve Geometry Applications: Triangles, Rectangles, and the Pythagorean Theorem**

Topics:

- A. Solve applications using properties of triangles
- B. Use the Pythagorean Theorem
- C. Solve applications using rectangle properties

**Suggested Homework Exercises: 211 – 275 odd**

### **Section 3.5 – Solve Uniform Motion Applications**

Topics:

- A. Solve uniform motion applications

**Suggested Homework Exercises: 283 – 303 odd**

### **Section 3.6 – Solve Applications with Linear Inequalities**

Topics:

- A. Solve applications with linear inequalities

**Suggested Homework Exercises: 309 – 331 odd**

### **SUGGESTED ASSESSMENT: Chapter 3 Practice Test**

\*Note: Practice Test Answer Keys are posted on the video library homepage

## **CHAPTER 4 – GRAPHS**

### **Section 4.1 – Use the Rectangular Coordinate System**

Topics:

- A. Plot points in a rectangular coordinate system
- B. Verify solutions to an equation in two variables
- C. Complete a table of solutions to a linear equation
- D. Find solutions to a linear equation in two variables

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

### **Section 4.2 – Graph Linear Equations in Two Variables**

Topics:

- A. Recognize the relationship between the solutions of an equation and its graph
- B. Graph a linear equation by plotting points
- C. Graph vertical and horizontal lines

**Suggested Homework Exercises: 55 – 133 odd**





### Section 4.3 – Graph with Intercepts

Topics:

- A. Identify the x and y-intercepts on a graph
- B. Find the x and y-intercepts from an equation of a line
- C. Graph a line using the intercepts

**Suggested Homework Exercises: 139 – 203 odd**

### Section 4.4 – Understand Slope of a Line

Topics:

- A. Use  $m = \frac{\text{rise}}{\text{run}}$  to find the slope of a line from its graph
- B. Find the slope of horizontal and vertical lines
- C. Use the slope formula to find the slope of a line between two points
- D. Graph a line given a point and the slope
- E. Solve slope applications

**Suggested Homework Exercises: 227 – 283 odd**

### Section 4.5 – Use the Slope-Intercept Form of an Equation of a Line (Part 1)

Topics:

- A. Identify the slope-intercept form of a line
- B. Recognize the relationship between the graph and the slope-intercept form of a line
- C. Graph a line using its slope and y-intercept
- D. Choose the most convenient method to graph a line

**Suggested Homework Exercises: 289 – 335 odd**

### Section 4.5 – Use the Slope-Intercept Form of an Equation of a Line (Part 2)

Topics:

- A. Graph and interpret applications of slope-intercept
- B. Use slopes to identify parallel lines
- C. Use slopes to identify perpendicular lines

**Suggested Homework Exercises: 337 – 381 odd**

### Section 4.6 – Find the Equation of a Line (Part 1)

Topics:

- A. Find the equation of a line given the slope and y-intercept
- B. Find the equation of a line given the slope and a point
- C. Find the equation of a line given two points

**Suggested Homework Exercises: 387 – 453 odd**

### Section 4.6 – Find the Equation of a Line (Part 2)

Topics:

- D. Find the equation of a line parallel to a given line
- E. Find the equation of a line perpendicular to a given line
- F. Mixed Practice

**Suggested Homework Exercises: 455 – 499 odd**





### **Section 4.7 – Graphs of Linear Inequalities**

Topics:

- A. Verify solutions to an inequality in two variables
- B. Recognize the relationship between the solutions of an inequality and its graph
- C. Graph linear inequalities

**Suggested Homework Exercises: 505 – 551 odd**

### **SUGGESTED ASSESSMENT: Chapter 4 Practice Test**

\*Note: Practice Test Answer Keys are posted on the video library homepage

## **CHAPTER 5 – SYSTEMS OF LINEAR EQUATIONS**

### **Section 5.1 – Solve Systems of Equations by Graphing**

Topics:

- A. Determine whether an ordered pair is a solution to a system of equations
- B. Solve a system of equations by graphing
- C. Determine the number of solutions of a linear system

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

### **Section 5.2 – Solve Systems of Equations by Substitution**

Topics:

- A. Solve systems of equations by substitution
- B. Solve applications of systems of equations by substitution

**Suggested Homework Exercises: 71 – 121 odd**

### **Section 5.3 – Solve Systems of Equations by Elimination**

Topics:

- A. Solve a system of equations by elimination
- B. Solve applications of systems of equations by elimination
- C. Choose the most convenient method to solve a system of linear equations

**Suggested Homework Exercises: 127 – 177 odd**

### **Section 5.4 – Solve Applications with Systems of Equations (Part 1)**

Topics:

- A. Solve direct translation applications
- B. Solve geometry applications

**Suggested Homework Exercises: 183 – 221 odd**

### **Section 5.4 – Solve Applications with Systems of Equations (Part 2)**

Topics:

- A. Solve uniform motion applications

**Suggested Homework Exercises: 223 – 233 odd**





### Section 5.5 – Solve Mixture Applications with Systems of Equations

Topics:

- A. Solve mixture applications
- B. Solve interest applications

**Suggested Homework Exercises: 239 – 269 odd**

### Section 5.6 – Graphing Systems of Linear Inequalities

Topics:

- A. Determine whether an ordered pair is a solution of a system of linear inequalities
- B. Solve a system of linear inequalities
- C. Solve applications of systems of inequalities

**Suggested Homework Exercises: 275 – 321 odd**

### **SUGGESTED ASSESSMENT:** Chapter 5 Practice Test

\*Note: Practice Test Answer Keys are posted on the video library homepage

## CHAPTER 6 – SYSTEMS OF LINEAR EQUATIONS

### Section 6.1 – Add and Subtract Polynomials

Topics:

- A. Determine the degree of polynomials
- B. Add and subtract polynomials
- C. Evaluate a polynomial for a given value

**Suggested Homework Exercises: 1 – 77 odd**

### Section 6.2 – Use Multiplication Properties of Exponents

Topics:

- A. Simplify expressions with exponents
- B. Simplify expressions using the Product Property
- C. Simplify expressions using the Power Property
- D. Simplify expressions using the Product to a Power Property
- E. Simplify expressions by applying several properties

**Suggested Homework Exercises: 89 – 163 odd**

### Section 6.3 – Multiply polynomials

Topics:

- A. Multiply a polynomial by a monomial
- B. Multiply a binomial by a binomial
- C. Multiply a trinomial by a binomial

**Suggested Homework Exercises: 173 – 273 odd**







### Section 6.4 – Special Products

Topics:

- A. Square a binomial using the Binomial Squares Pattern
- B. Multiply conjugates using the Product of Conjugates Pattern
- C. Recognize and use the appropriate special product pattern

**Suggested Homework Exercises: 303 – 349 odd**

### Section 6.5 – Divide Monomials

Topics:

- A. Simplify expressions using the Quotient Property for Exponents
- B. Simplify expressions with zero exponents
- C. Simplify expressions using the Quotient to a Power Property
- D. Simplify expressions by applying several properties
- E. Divide monomials

**Suggested Homework Exercises: 357 – 421 odd**

### Section 6.6 – Divide Polynomials

Topics:

- A. Divide a polynomial by a monomial
- B. Divide a polynomial by a binomial

**Suggested Homework Exercises: 443 – 495 odd**

### Section 6.7 – Integer Exponents and Scientific Notation

Topics:

- A. Use the definition of a negative exponent
- B. Simplify expressions with integer exponents
- C. Convert from decimal notation to scientific notation
- D. Convert scientific notation to decimal form
- E. Multiply and divide using scientific notation

**Suggested Homework Exercises: 501 – 573 odd**

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

\*Note: Practice Test Answer Keys are posted on the video library homepage

## CHAPTER 7 – FACTORING

### Section 7.1 – Greatest Common Factor and Factor by Grouping

Topics:

- A. Find the greatest common factor (GCF) of two or more expressions
- B. Factor the greatest common factor from a polynomial
- C. Factor by grouping

**Suggested Homework Exercises: 1 – 57 odd**



**Section 7.2 – Factor Trinomials of the Form  $x^2 + bx + c$** 

Topics:

A. Factor trinomials of the form  $x^2 + bx + c$ B. Factor trinomials of the form  $x^2 + bxy + cy^2$ **Suggested Homework Exercises: 63 – 127 odd****Section 7.3 – Factor Trinomials of the Form  $ax^2 + bx + c$  (Part 1)**

Topics:

A. Factor trinomials of the form  $ax^2 + bx + c$  with a GCF

B. Factor trinomials using Trial and Error

**Suggested Homework Exercises: 135 – 165 odd****Section 7.3 - Factor Trinomials of the Form  $ax^2 + bx + c$  (Part 2)**

Topics:

C. Factor trinomials using the AC Method

**Suggested Homework Exercises: 167 – 207 odd****Section 7.4 – Factor Special Products (Part 1)**

Topics:

A. Factor perfect square trinomials

B. Factor difference of squares

**Suggested Homework Exercises: 215 – 247 odd****Section 7.4 – Factor Special Products (Part 2)**

Topics:

C. Factor sums and differences of cubes

**Suggested Homework Exercises: 249 – 271 odd****Section 7.5 – General Strategy for Factoring Polynomials**

Topics:

A. Recognize and use the appropriate method to factor a polynomial completely

**Suggested Homework Exercises: 279 – 309 odd****Section 7.6 – Quadratic Equations**

Topics:

A. Solve quadratic equations by using the Zero Product Property

B. Solve quadratic equations by factoring

C. Solve applications modeled by quadratic equations

**Suggested Homework Exercises: 315 – 357 odd****SUGGESTED ASSESSMENT: Chapter 7 Practice Test**

\*Note: Practice Test Answer Keys are posted on the video library homepage





## CHAPTER 8 – RATIONAL EXPRESSIONS AND EQUATIONS

### Section 8.1 – Simplify Rational Expressions

Topics:

- A. Determine the values for which a rational expression is undefined
- B. Evaluate rational expressions
- C. Simplify rational expressions
- D. Simplify rational expressions with opposite factors

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

### Section 8.2 – Multiply and Divide Rational Expressions

Topics:

- A. Multiply rational expressions
- B. Divide rational expressions

**Suggested Homework Exercises: 73 – 123 odd**

### Section 8.3 – Add and Subtract Rational Expressions with a Common Denominator

Topics:

- A. Add rational expressions with a common denominator
- B. Subtract rational expressions with a common denominator
- C. Add and subtract rational expressions whose denominators are opposites

**Suggested Homework Exercises: 129 – 163 odd**

### Section 8.4 – Add and Subtract Rational Expressions with Unlike Denominators (Part 1)

Topics:

- A. Find the least common denominator (LCD) of rational expressions
- B. Find equivalent rational expressions

**Suggested Homework Exercises: 169 – 183 odd**

### Section 8.4 – Add and Subtract Rational Expressions with Unlike Denominators (Part 2)

Topics:

- C. Add rational expressions with different denominators
- D. Subtract rational expressions with different denominators

**Suggested Homework Exercises: 185 – 249 odd**

### Section 8.5 – Simplify Complex Rational Expressions

Topics:

- A. Simplify a complex rational expression by writing it as a division
- B. Simplify a complex rational expression by using the LCD

**Suggested Homework Exercises: 255 – 297 odd**



**Section 8.6 – Solve Rational Equations**

Topics:

- A. Solve rational equations
- B. Solve a rational equation for a specific variable

**Suggested Homework Exercises: 303 – 359 odd****Section 8.7 – Solve Proportion and Similar Figure Applications**

Topics:

- A. Solve proportions
- B. Solve similar figure applications

**Suggested Homework Exercises: 365 – 417 odd****Section 8.8 – Solve Uniform Motion and Work Applications**

Topics:

- A. Solve uniform motion applications
- B. Solve work applications

**Suggested Homework Exercises: 429 – 457 odd****Section 8.9 – Use Direct and Inverse Variation**

Topics:

- A. Solve direct variation problems
- B. Solve inverse variation problems

**Suggested Homework Exercises: 463 – 507 odd****SUGGESTED ASSESSMENT: Chapter 8 Practice Test**

\*Note: Practice Test Answer Keys are posted on the video library homepage

**CHAPTER 9 – ROOTS AND RADICALS****Section 9.1 – Simplify and Use Square Roots**

Topics:

- A. Simplify expressions with square roots
- B. Estimate square roots
- C. Approximate square roots
- D. Simplify variable expressions with square roots

**Suggested Homework Exercises: 1 – 47 odd****Section 9.2 – Simplify Square Roots**

Topics:

- A. Use the Product Property to simplify square roots
- B. Use the Quotient Property to simplify square roots

**Suggested Homework Exercises: 53 – 139 odd**



### Section 9.3 – Add and Subtract Square Roots

Topics:

- A. Add and subtract like square roots
- B. Add and subtract square roots that need simplification

**Suggested Homework Exercises: 145 – 227 odd**

### Section 9.4 – Multiply Square Roots

Topics:

- A. Multiply square roots
- B. Use polynomial multiplication to multiply square roots

**Suggested Homework Exercises: 233 – 309 odd**

### Section 9.5 – Divide Square Roots

Topics:

- A. Divide square roots
- B. Rationalize a one-term denominator
- C. Rationalize a two-term denominator

**Suggested Homework Exercises: 317 – 383 odd**

### Section 9.6 – Solve Equations with Square Roots

Topics:

- A. Solve radical equations
- B. Use square roots in applications

**Suggested Homework Exercises: 389 – 439 odd**

### Section 9.7 – Higher Roots

Topics:

- A. Simplify expressions with higher roots
- B. Use the Product Property to simplify expressions with higher roots
- C. Use the Quotient Property to simplify expressions with higher roots
- D. Add and subtract higher roots

**Suggested Homework Exercises: 443 – 519 odd**

### Section 9.8 – Rational Exponents

Topics:

- A. Simplify expressions with  $a^{1/n}$
- B. Simplify expressions with  $a^{m/n}$
- C. Use the Laws of Exponents to simplify expressions with rational exponents

**Suggested Homework Exercises: 525 – 599 odd**

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

\*Note: Practice Test Answer Keys are posted on the video library homepage





## CHAPTER 10 – ROOTS AND RADICALS

### Section 10.1 – Solve Quadratic Equations Using the Square Root Property

Topics:

A. Solve quadratic equations of the form  $ax^2 = k$

B. Solve quadratic equations of the form  $a(x - h)^2 = k$

**Suggested Homework Exercises: 1 – 51 odd**

### Section 10.2 – Solve Quadratic Equations by Completing the Square

Topics:

A. Complete the square of a binomial expression

B. Solve quadratic equations of the form  $x^2 + bx + c = 0$  by completing the square

C. Solve quadratic equations of the form  $ax^2 + bx + c = 0$  by completing the square

**Suggested Homework Exercises: 57 – 93 odd**

### Section 10.3 – Solve Quadratic Equations Using the Quadratic Formula

Topics:

A. Solve quadratic equations using the Quadratic Formula

B. Use the discriminant to determine the number of solutions of a quadratic equation

C. Identify the most appropriate method to use to solve a quadratic equation

**Suggested Homework Exercises: 99 – 137 odd**

### Section 10.4 – Solve Applications Modeled by Quadratic Equations

Topics:

A. Solve applications modeled by Quadratic Equations

**Suggested Homework Exercises: 143 – 157 odd**

### Section 10.5 – Graphing Quadratic Equations in Two Variables (Part 1)

Topics:

A. Recognize the graph of a quadratic equation in two variables

B. Identify the properties of a quadratic equation

**Suggested Homework Exercises: 163 – 177 odd**

### Section 10.5 – Graphing Quadratic Equations in Two Variables (Part 2)

Topics:

C. Graph quadratic equations in two variables

D. Solve maximum and minimum applications

**Suggested Homework Exercises: 179 – 207 odd**

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

\*Note: Practice Test Answer Keys are posted on the video library homepage

