# MATH 0110 Intermediate Algebra

**Textbook:** Intermediate Algebra by Elayn Martin-Gay, 7th Edition

## Sections Covered

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Learning Objectives</th>
</tr>
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<tbody>
<tr>
<td>1.2</td>
<td>Algebraic expressions and Sets of Numbers</td>
<td>Identify and evaluate algebraic expressions.</td>
</tr>
<tr>
<td>1.3</td>
<td>Operations on Real Numbers and Order of Operations</td>
<td>Add and subtract real numbers.</td>
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<tr>
<td>1.4</td>
<td>Properties of Real Numbers and Algebraic Expressions</td>
<td>Use operation and order symbols to write mathematical sentences.</td>
</tr>
<tr>
<td>2.1</td>
<td>Linear Equations in One Variable</td>
<td>Solve linear equations using properties of equality.</td>
</tr>
</tbody>
</table>
• Solve linear equations containing fractions or decimals.
• Recognize identities and equations with no solutions.

• Section 2.2  An Introduction to Problem Solving
  Learning objectives:
  • Write algebraic expressions that can be simplified.
  • Apply the steps for problems solving.

• Section 2.3  Formulas and Problem Solving
  Learning objectives:
  • Solve a formula for a specified variable.
  • Use formulas to solve problems.

• Section 2.4  Linear Inequalities and Problem Solving
  Learning objectives:
  • Use interval notation.
  • Solve linear inequalities using the addition property of inequality.
  • Solve linear inequalities using the multiplication and the addition properties of inequality.
  • Solve problems that can be modeled by linear inequalities.

• Section 2.5  Compound Inequalities
  Learning objectives:
  • Find the intersections of two sets.
  • Solve compound inequalities containing and.
  • Find the union of two sets.
  • Solve compound inequalities containing or.

• Section 3.1  Graphing Equations
  Learning objectives:
  • Plot ordered pairs.
  • Determine whether an ordered pair of numbers is a solution of an equation in two variables.
  • Graph linear equations.
  • Graph nonlinear equations.
• **Section 3.2  Introduction to Functions**
  Learning objectives:
  • Define relation, domain, and range.
  • Identify functions.
  • Use the vertical line test for functions.
  • Use function notation.

• **Section 3.3  Graphing Linear Functions**
  Learning objectives:
  • Graph linear functions.
  • Graph linear functions by using intercepts.
  • Graph vertical and horizontal lines.

• **Section 3.4  The Slope of a Line**
  Learning objectives:
  • Find the slope of a line given two points on the line.
  • Find the slope of a line given the equation of the line.
  • Interpret the slope-intercept form in an application.
  • Find the slopes of horizontal and vertical lines.
  • Compare the slopes of parallel and perpendicular lines.

• **Section 3.5  Equations of Lines**
  Learning objectives:
  • Graph a line using its slope and $y$-intercept.
  • Use the slope-intercept form to write the equation of a line.
  • Use the point-slope form to write the equations of a line.
  • Write equations of vertical and horizontal lines.
  • Find equations of parallel and perpendicular lines.

• **Section 4.1  Solving Systems of Linear Equations in Two Variables**
  Learning objectives:
  • Determine whether an ordered pair is a solution of a system of two linear equations.
  • Solve a system by graphing.
  • Solve a system by substitution.
  • Solve a system by elimination.
- **Section 4.3  Systems of Linear Equations and Problem Solving**
  
  **Learning objectives:**
  
  - Solve problems that can be modeled by a system of two linear equations.
  - Solve problems with cost and revenue functions.
  - Solve problems that can be modeled by a system of three linear equations.

- **Section 5.1  Exponents**
  
  **Learning objectives:**
  
  - Use the product rule for exponents.
  - Evaluate expressions raised to the 0 power.
  - Use the quotient rule for exponents.
  - Evaluate expressions raised to the negative nth power.
  - Convert between scientific notation and standard notation.

- **Section 5.2  More work with exponents**
  
  **Learning objectives:**
  
  - Use the power rules for exponents.
  - Use exponent rules and definitions to simplify exponential expressions.
  - Compute using scientific notation.

- **Section 5.3  Polynomials and Polynomial Functions**
  
  **Learning objectives:**
  
  - Identify term, constant, polynomial, monomial, binomial, trinomial, and the degree of a term and of a polynomial.
  - Define polynomial functions.
  - Review combining like terms.
  - Add polynomials.
  - Subtract polynomials.
  - Recognize the graph of a polynomial function from the degree of the polynomial.

- **Section 5.4  Multiplying Polynomials**
  
  **Learning objectives:**
  
  - Multiply two polynomials.
  - Multiply binomials.
  - Square binomials.
- Multiply the sum and difference of two terms.
- Multiply three or more polynomials.
- Evaluate polynomial functions.

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<tr>
<th>Section 5.5  The Greatest Common Factoring and Factoring by Grouping</th>
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<tbody>
<tr>
<td>Learning objectives:</td>
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<tr>
<td>• Identify the GCF.</td>
</tr>
<tr>
<td>• Factor out the GCF of a polynomial’s terms.</td>
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<tr>
<td>• Factor polynomials by grouping.</td>
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<tr>
<th>Section 5.6  Factoring Trinomials</th>
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<tbody>
<tr>
<td>Learning objectives:</td>
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<tr>
<td>• Factor trinomials of the form $x^2 + bx + c$.</td>
</tr>
<tr>
<td>• Factor trinomials of the form $ax^2 + bx + c$.</td>
</tr>
<tr>
<td>• Factor by substitution.</td>
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<tr>
<th>Section 5.7  Factoring by Special Products</th>
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<tbody>
<tr>
<td>Learning objectives:</td>
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<tr>
<td>• Factor a perfect square trinomial.</td>
</tr>
<tr>
<td>• Factor the difference of two squares.</td>
</tr>
<tr>
<td>• Factor the sum or difference of two cubes.</td>
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<tr>
<th>Section 5.8  Solving Equations by Factoring</th>
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<tbody>
<tr>
<td>Learning objectives:</td>
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<tr>
<td>• Solve polynomial equations by factoring.</td>
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<tr>
<td>• Solve problems that can be modeled by polynomial equations.</td>
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<tr>
<td>• Find the x-intercept of a polynomial function.</td>
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<th>Section 6.1  Rational Functions and Multiplying and Dividing Rational Expressions</th>
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<tr>
<td>Learning objectives:</td>
</tr>
<tr>
<td>• Find the domain of a rational expression.</td>
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<tr>
<td>• Simplify rational expressions.</td>
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<tr>
<td>• Multiply rational expressions.</td>
</tr>
<tr>
<td>• Divide rational expressions.</td>
</tr>
<tr>
<td>• Use rational functions in applications.</td>
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</tbody>
</table>
- **Section 6.2 Adding and subtracting Rational Expressions**
  Learning objectives:
  - Add or subtract rational expressions with a common denominator.
  - Identify the least common denominator (LCD) of two or more rational expressions.
  - Add or subtract rational expressions with unlike denominators.

- **Section 6.3 Simplifying Complex Fractions**
  Learning objectives:
  - Simplify complex fractions by simplifying the numerator and denominator and then dividing.
  - Simplify complex fractions by multiplying by a common denominator.
  - Simplify expressions with negative exponents.

- **Section 6.5 Solving Equations containing Rational Expressions**
  Learning objectives:
  - Solve equations containing rational expressions.