# Course Title: PRE-ALGEBRA A

**Course No.** 3261  
**Grade level:** 9-12

**Text and Resources:**  
*California Algebra Readiness; Prentice Hall*

---

## Course Content: Key Content Standards and Course Objectives

The following objectives are based on the California Common Core State Standards for Mathematics. Please refer to the Math Common Core State Standards online for specific grade level standards.

1. **Number and Quantity:** Extend the properties of exponents to rational exponents. Use properties of rational and irrational numbers. Reason quantitatively and use units to solve problems. Perform arithmetic operations with complex numbers. Represent complex numbers and their operations on the complex plane. Use complex numbers in polynomial identities and equations. Represent and model with vector quantities. Perform operations on vectors. Perform operations on matrices and use matrices in applications.

2. **Algebra:** Interpret the structure of expressions. Write expressions in equivalent forms to solve problems. Perform arithmetic operations on polynomials. Understand the relationship between zeros and factors of polynomials. Use polynomial identities to solve problems. Rewrite rational expressions. Create equations that describe numbers or relationships. Understand solving equations as a process of reasoning and explain the reasoning. Solve equations and inequalities in one variable. Solve systems of equations. Represent and solve equations and inequalities graphically.

3. **Functions:** Understand the concept of a function and use function notation. Interpret functions that arise in applications in terms of the context. Analyze functions using different representations. Build a function that models a relationship between two quantities. Build new functions from existing functions. Construct and compare linear, quadratic, and exponential models and solve problems. Interpret expressions for functions in terms of the situation they model. Extend the domain of trigonometric functions using the unit circle. Model periodic phenomena with trigonometric functions. Prove and apply trigonometric identities.

4. **Geometry:** Experiment with transformations in the plane. Understand congruence in terms of rigid motions. Prove geometric theorems. Make geometric constructions. Understand similarity in terms of similarity transformations. Prove theorems involving similarity. Define trigonometric ratios and solve problems involving right triangles. Apply trigonometry to general triangles. Understand and apply theorems about circles. Find arc lengths and areas of sectors of circles. Translate between the geometric description and the equation for a conic section. Use coordinates to prove simple geometric theorems algebraically. Explain volume formulas and use them to solve problems. Visualize relationships between two-dimensional and three-dimensional objects. Apply geometric concepts in modeling situations.

5. **Statistics and Probability:** Summarize, represent, and interpret data on a single count or measurement variable. Summarize, represent, and interpret data on two categorical and quantitative variables. Interpret linear models. Understand and evaluate random processes underlying statistical experiments. Make inferences and justify conclusions from sample surveys, experiments and observational studies. Understand independence and conditional probability and use them to interpret data. Use the rules of probability to compute probabilities of compound events in a uniform probability model. Calculate expected values and use them to solve problems. Use probability to evaluate outcomes of decisions.

---

## Methods of Study

1. Students will complete all activities assigned.
2. Students will participate in discussion with other class members and/or teacher.

---

## Evaluation of Performance Standards

1. Students will complete all assignments with a minimum of 70% accuracy.
2. The supervising teacher will be satisfied with the quality of the student’s work.
3. The student must receive a minimum score of 70% on a teacher assigned final evaluation.

---

**Course Description**

**Course Value:** *One Semester  
**Credit Value:** 1 – 5 Credits

This course will prepare students to meet the California Common Core State Standards for Mathematics. Students will acquire the skills necessary to manipulate numbers, solve equations and understand the general principles at work.

This Pre-Algebra course will help students develop the skills necessary to manipulate numbers, solve equations and understand the general principles at work. Students will compute interest through percentages, graph linear function, compare rational numbers with scientific notation, and convert fractional numbers between fractions, decimals, and percents. Practical application through the incorporation of word problems is required in this course. This course includes many of the mathematical concepts that are found in the California High School Exit Exam. *Open entry/open exit

### Key Content Standards and Course Objectives (cont.)

**Mathematical Practices**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.
Textbook Assignment: *Prentice Hall CA. Algebra Readiness, Part I* (5.0 credits)

- All textbook work must meet 70% accuracy level for a “C” grade.

**Helpful Hints/Resources:**
- Review “What you’ve Learned,” and try the problems in “Check Your Readiness.”
- Review the “What You’ll Learn Next” and “New Vocabulary” sections.
- Throughout the chapter, use the online “Active Math” resource as needed.
- Review the “Skills and Concepts” section before completing the Chapter Review/Test.

**MUST SHOW ALL WORK OR RE DO**

**Do all problems listed unless noted to do even only**

**Chapters 1-2:**
- Complete Chapters 1 & 2, pages 2-83
  - Chapter 1 (6 sections), Chapter 2 (6 sections)
- “Check your Readiness” (beginning of every chapter)
- Standards Practice – Section A - Practice by Example (even only)
  - Section B - Apply your Skills (even only)
- Multiple Choice Practice & Mixed Review
- Taking Test Strategies & Multiple Choice Practice
- Chapter Reviews – Vocabulary Review & Skills and Concepts
- Chapter Test (even only)
- Standards Mastery (end of every chapter)
- Complete weekly Study Guide and Assessment.

**Chapters 3-4:**
- Complete Chapters 3 & 4, pages 84-167
  - Chapter 3 (7 sections), Chapter 4 (5 sections)
- “Check your Readiness” (beginning of every chapter)
- Standards Practice – Section A - Practice by Example (even only)
  - Section B - Apply your Skills (even only)
- Multiple Choice Practice & Mixed Review
- Taking Test Strategies & Multiple Choice Practice
- Chapter Reviews – Vocabulary Review & Skills and Concepts
- Chapter Test (even only)
- Standards Mastery (end of every chapter)
- Complete weekly Study Guide and Assessment.

**Chapter 5:**
- Complete Chapter 5, pages 168-211
- “Check your Readiness” (beginning of every chapter)
- Standards Practice – Section A - Practice by Example (even only)
  - Section B - Apply your Skills (even only)
- Multiple Choice Practice & Mixed Review
- Taking Test Strategies & Multiple Choice Practice
- Chapter Review – Vocabulary Review & Skills and Concepts
- Chapter Test (even only)
- Standards Mastery (end of every chapter)
- Complete weekly Study Guide and Assessment
- Complete at least three Extension Activities

Extension Activity on the other side
Complete at least 3 of the 5 Extension Activities

Extension Activity Options:

☐ Complete one Activity Lab from Chapters 1 – 5.

☐ Complete one Challenge Question (Section C in each Chapter)

☐ Use a Flow Map to demonstrate the steps involved in solving a 2 – step linear equation with a variable (ex. 5x – 3.4 = 26.6 )

☐ Go to PearsonSuccess.net and compete vs. the computer in Quiz Game – must show 70% or above mastery Chapters 1 – 5.

☐ Complete a Printable page from online resources at PHschools.com or Math Companion – Chapters 1 -5. (page to be determined by teacher & student in area of concern – or to show mastery)

☐ Teacher generated activity

Teacher/Student Notes for Extension Activity:
Vocabulary
Select at least three Vocabulary Words, and draw a Circle Map including a minimum of six categories. You may use the Dictionary Definition, which is listed after each vocabulary word as one of your categories. Study all vocabulary words.

simplify: to change a mathematical expression into its simplest form
evaluate: to judge how good or useful something is
identify: to know or discover what something is
indicate: to show that something will happen or is true
absolute: a rule that is true or right in all situations
justify: explain, to give an explanation why something was done
Short Answer

1. You have $20 to spend. You buy socks that cost $3 per pair.
   a. Write an expression for the amount of money you have left after buying \( s \) pairs of socks.
   b. How many pairs of socks did you buy if you have $8 left?

2. Use mental math and the Distributive Property to simplify.
   \[ 21 \cdot 16 - 16 \cdot 16 \]
   Estimate by rounding or by using compatible numbers.

3. \( 172 \div 7 \)

4. Evaluate the expression for the given value.
   \( x - y - z \) for \( x = -10, y = -2, \) and \( z = 3 \)

5. \( cd - (d + c) \) for \( c = 3 \) and \( d = -5 \)

6. \( 2x^2 \) for \( x = -3 \)

Use a number line to find the sum.

7. \( -4 + (-6) \)

8. During the day the temperature was \( 2^\circ F \). At night, the temperature dropped \( 18^\circ F \). What was the temperature at night?

9. One day at 3:00 P.M., the temperature was \( 7^\circ F \) in Nome, Alaska. At 10:00 P.M. the temperature was \( -21^\circ F \). What was the average change in temperature per hour?

Write using exponents.

10. \( 9 \cdot 9 \)
Vocabulary
Select at least three Vocabulary Words, and draw a Circle Map including a minimum of six categories. You may use the Dictionary Definition, which is listed after each vocabulary word as one of your categories. Study all vocabulary words.

expression: a sign or group of signs that represent a math problem
inverse: the complete opposite of something
isolate: to separate one person, group, or thing from other people or things
factor: one of several things that influence or cause a situation
estimate: figuring out the value, size or amount of something
determine: to find out the facts about something
Short Answer

Solve the equation.

1. \( w + 28 = 23 \)

Write and solve an equation.

2. Alexa scored 87 on her history test. The test had a multiple-choice section and a short-answer section. Alexa got 74 points on the multiple-choice section. How many points \( p \) did she receive on the short-answer section?

Solve the equation.

3. \( \frac{r}{7} = -8 \)

Graph the solution of the equation.

4. \( b - 12 = -8 \)

5. The formula \( s = 20 \sqrt{273 + T} \) gives an estimate for the speed of sound \( s \) in meters per second when the air temperature is \( T^\circ C \). Estimate the speed of sound for 91\(^\circ C\). Round to the nearest tenth.

6. Which of these numbers is NOT divisible by 2, 3, 4, 5, 6, and 9?
   - 767,880
   - 1,273,320
   - 4,222,368
   - 6,665,400

7. Find the GCF of 93 and 51 by listing factors.

8. Write \( \frac{42}{49} \) in simplest form using the GCF.

9. Write \( \frac{60}{96} \) in simplest form using prime factorization.

10. A player has 26 hits in 120 times at bat. Write the player’s batting average as a decimal.
**Vocabulary**
Select at least three Vocabulary Words, and draw a Circle Map including a minimum of six categories. You may use the Dictionary Definition, which is listed after each vocabulary word as one of your categories. **Study all vocabulary words.**

<table>
<thead>
<tr>
<th>Circle Map Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dictionary Definition</td>
</tr>
<tr>
<td>Student Definition</td>
</tr>
<tr>
<td>Part of Speech</td>
</tr>
<tr>
<td>Meaningful Sentence</td>
</tr>
<tr>
<td>Illustration</td>
</tr>
<tr>
<td>What it is (examples)</td>
</tr>
<tr>
<td>What it isn’t (examples)</td>
</tr>
<tr>
<td>Word Parts</td>
</tr>
<tr>
<td>Cognate</td>
</tr>
<tr>
<td>Synonyms</td>
</tr>
<tr>
<td>Antonyms</td>
</tr>
<tr>
<td>Related Words/Word Family</td>
</tr>
<tr>
<td>Sentence from book</td>
</tr>
</tbody>
</table>

**proper:** right, suitable, or correct

**improper:** wrong or not correct

**common:** an attitude or quality that all the different members of a group share

**eliminate:** to completely get rid of something that is unnecessary or unwanted

**expand:** to become larger in size, number, or amount
Short Answer

Find the sum or difference. Write your answer as a mixed number or a fraction in simplest form.

1. \( \frac{2}{7} - \frac{1}{8} \)

2. \( \frac{1}{10} - \left(-\frac{11}{12}\right) \)

Simplify.

3. \( -\frac{3}{5} \left( \frac{5}{6} - 1 \right) \)

4. \( \left( \frac{5}{6} + 2 \right) \div \left(-\frac{1}{3}\right) \)

Solve the equation.

5. \( \frac{r}{7} = -8 \)

6. Steve drove 1,334 miles in 23 hours. What was his mean driving speed?

Solve the equation.

7. \( \frac{p}{-3.4} = -1.3 \)

Combine like terms.

8. \( (-3y^2 - 7y - 9) - (4y^2 + 6y + 9) \)