

Alabama Algebra 1 with CORD Algebra 1, 2nd Edition**Algebra I**

Algebra I is a formal, in-depth study of algebraic concepts and the real number system. Content in this category will be assessed as part of graduation requirements. Local school systems may design the types of courses, theoretical or applied, and the time frames [140 hours (1 credit), 210 hours (1 1/2 credits), or 280 hours (2 credits)] that will meet the needs of all students. In this way, delivery of Algebra I content will vary; but the content will not be compromised. For example, Technical Mathematics and Technical Algebra may be substituted for Introduction to Algebra and Algebra I provided the core content of both Introduction to Algebra and Algebra I is taught. Local school systems may choose to offer Algebra I in seventh or eighth grade.

Simplifying expressions and solving equations and inequalities are a major part of the course. Function concepts, graphing linear equations, and applying formulas to find perimeter, area, volume, circumference, distance, midpoint, and slope are studied in many contexts. Solving and graphing systems of equations and solving quadratic and absolute value equations are explored. Topics in statistics include identifying lines of best fit.

Representation of problem situations that involve variable quantities with expressions, equations, or inequalities is a central focus of Algebra I. Emphasis is placed on using mathematical modeling in data collection and in making predictions. Tables and graphs are utilized to interpret algebraic expressions, equations, or inequalities. Calculators should be used on a regular basis, including use during assessments.

Stanford Achievement Test, Ninth Edition Task 1 objectives are identified. Task 1 objectives not matched are listed at the end of the course. Those objectives are addressed in other courses.

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Algebra I

NUMBER SENSE
NUMBER SYSTEMS
NUMBER THEORY

CONTENT STANDARDS

Students will

1. Define sets of numbers.
 - Whole numbers
 - Natural numbers
 - Integers
 - Rational numbers
 - Irrational numbers
 - Real numbers

Page or Location: 4-8

2. Graph real numbers on the number line.

Page or Location: 5-7, 12, 13-14, 70, 96, 206, 455, 496-500, 537-538, 554-555

3. Graph the solution set of a linear inequality in one variable on the number line. *Stanford 9*

Page or Location: 496-500, 506-511, 512-518, 519-522, 544, 554, 687

4. Use the order of operations, including exponentiation, to simplify numeric and variable expressions.

Page or Location: 80-84, 85, 142, 176, 195-199, 217, 235, 240, 267, 272, 287-290, 311, 319, 338, 403

5. Perform operations involving square roots with and without calculators.

Page or Location: 304-311, 324, 421, 511, 649-656, 733

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6. Apply the number properties.

- Commutative
- Associative
- Distributive
- Inverse
- Identity
- Substitution
- Closure

Page or Location: 85-86, TE 86, 146-154, 161-168, 169-174, 175-179, 419, 456-458, 560, 570-574, 586-592, 601-606, 612

GEOMETRY
SPATIAL SENSE
MEASUREMENT

7. Recognize absolute value of a number as its distance from zero on a number line.

Page or Location: 15-17

8. Apply the perimeter and area of a polygon to solve problems, given the formulas. *Stanford 9*

Page or Location: 88, 90-91, 96, 97-102, 128-143, 154, 179, 186-188, 240, 259, 290, 304, 339, 355, 361, 396, 458-459, 476-477, 561, 563, 586, 600, 615, 616, 617, 642, 646, 655, 664-677, 680, 696, 698, 708, 721

9. Determine the volume and surface area of geometric solids, given the formulas. *Stanford 9*

Page or Location: 107-113, 123-125, 129, 130, 142-143, 160, 174, 240, 277, 311, 319, 414, 455, 469, 500, 522, 578-579, 580, 632, 644, 664, 665, 737

10. Solve problems involving the area and circumference of a circle, given the formulas.

Page or Location: 103-106, 138-139, 141, 143, 179, 185-186, 212, 240, 311, 320, 339, 455, 498, 563, 580, 614, 615, 616, 698

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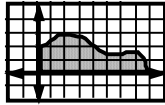
11. Apply length, midpoint, and slope of a line segment when given coordinates on a Cartesian plane. **Stanford 9**

- Determining radius or diameter
- Determining dimensions of a polygon

Page or Location: 218-224, 242-243, 276, 691-693, 716

12. Estimate areas under curves graphed on the Cartesian plane. **Stanford 9**

Example:



Page or Location: 422-425

13. Apply the terminology associated with the Cartesian plane to the graphing of equations.

- Origin
- Abscissa
- Ordinate
- Quadrant
- Axes

Page or Location: 206-212, 276, 711

14. Graph linear inequalities on the Cartesian plane.

Page or Location: 523-531, 532-536, 546-550, 554, 580, 716

15. Graph and identify graphs of common relations. **Stanford 9**

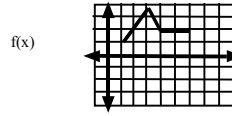
- $y = c$, where c is a constant
- $x = c$, where c is a constant
- $y = x$
- $y = |x|$
- $y = \sqrt{x}$
- $y = x^2$

Page or Location: 218-224, TE 220, 243-245, 296-303, 304-311

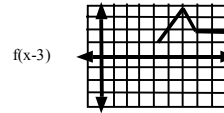
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16. Identify the effects of parameter changes on functions. *Stanford 9*

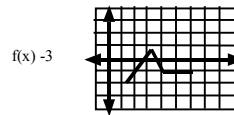
Example: Given function



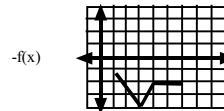
Horizontal shift



Vertical shift



Reflection across x -axis



Page or Location: 256-259, 274, 296-303, 318, 348, 620-624, 698

17. Graph lines given two points or a slope and a point.

Page or Location: 213-217, 218, 225-233, 247, 282

18. Graph linear equations written in standard form or slope-intercept form.

Page or Location: 227-233, 442-448, 523-531

19. Graph systems of linear equations.

Page or Location: 442-448, 449-454, 477-479, 482-489

**PATTERNS
FUNCTIONS
ALGEBRA**

20. Perform basic operations on algebraic expressions.

Page or Location: 80-84, 254

21. Evaluate algebraic expressions. *Stanford 9*

Page or Location: 80-84, 85, 142, 217, 240, 311

22. Know and use laws of exponents including zero and negative integral exponents.

Page or Location: 39-43, 570-574, 575-580, 616

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23. Translate verbal or symbolic information into algebraic expressions.

Page or Location: 80-84, 178, 195, 196

24. Identify equations or inequalities that represent graphs or problem situations. *Stanford 9*

Page or Location: 246, 328-333, 530

25. Factor algebraic expressions.

- Polynomials in which each term contains a common monomial
- Binomials
- Trinomials

Page or Location: 570-574, 593-599, 600-606, 607-608, 613-617, 633-637, 647

26. Solve linear equations. *Stanford 9*

Page or Location: 146-154, 155-160, 161-168, 169-174, 175-179, 180-184, 188-189, 190-203, 212, 217, 224, 248, 254, 259, 286, 295, 303, 311, 348, 367, 425, 563, 592, 600, 625, 632, 698, 716

27. Solve simple radical equations. *Stanford 9*

Examples: $\sqrt{x-4} = 0$
 $\sqrt{x-4} = 2$

Page or Location: 717-721, 730-732, 739, 740

28. Solve literal equations for any variable.

Page or Location: 148, 154, 160, 163, 167, 171, 172, 173, 184, 185, 186-188, 190, 193, 195, 198, 199, 200, 248, 267, 361, 475, 573, 574, 698, 708, 720

29. Determine equations of lines satisfying given conditions.

- Two points
- Point and slope
- Graph of a line

Page or Location: 234-240, 242-248, 249-254, 276, 292, 319, 410, 531, 687

30. Solve linear inequalities. *Stanford 9*

Page or Location: 496-500, 501-505, 506-511, 512-518, 519-522, 523-531, 532-536, 554, 574, 625

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31. Solve systems of linear equations.

- Graphically
- Algebraically

Page or Location: 442-448, 449-455, 456-462, 463-469, 470-475, 476-477, 477-479, 479-480, 481-493, 518, 531, 536, 569, 580, 585, 592, 600, 606, 625, 632, 644, 698, 708, 721

32. Solve word problems using a variety of methods. *Stanford 9*

- Trial and error
- Algebraic methods
- Drawings and graphs
- Charts and tables
- Patterns

Page or Location: See features “**Four Step Plan**” pages 29, 90, 158, 245, 317, 346, 423, 460, 534, 579, 642, 720; “**Workplace Communication**” pages 111, 172, 216, 302, 353, 401, 473, 509, 605, 705; “**Practice and Problem Solving**” ” and “**Mixed Review**” exercises at end of each lesson; “**Math Applications**” exercises at end of each chapter

33. Solve quadratic equations using the zero product property.

Page or Location: 633-637

34. Solve simple absolute value equations.

Examples: $|x| = 5$

$$|x + 2| = 3$$

Page or Location: 180-184, 191, 462

35. Solve problems involving direct variation and inverse (indirect) variation.

Page or Location: 291-295, 330, 332, 333, 335, 338

36. Determine whether or not relations are functions, given graphs, tables of values, or sets of ordered pairs.

Page or Location: 280-286, 290

37. Recognize domain and range of relations, given graphs, tables of values, or sets of ordered pairs.

Page or Location: 280-286, 293, 297, 301, 332, 338, 448, 469, 511

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38. Evaluate functions for given values in their domains.

Page or Location: 283, 287-290, 292-293, 301, 627

39. Determine equations of functions, given tables of values or graphs.

Stanford 9

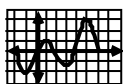
Page or Location: 241-248, 274, 282, 286, 318, 328-333, 404-410, 432, 437, 662-663, 667, 677

40. Identify graphs of functions, given data in tables or equations. **Stanford 9**

Page or Location: 246, 328, 329, 332, 333, 530

41. Determine the maximum or minimum points of graphs. **Stanford 9**

Example:



maximum point (5, 3)

minimum point (-1, -2)

Page or Location: 620-624, 626-632, 639-643, 666, 667, 668, 676

PROBABILITY

STATISTICS

DISCRETE MATHEMATICS

42. Draw inferences or make predictions from tables. **Stanford 9**

Page or Location: 342-348, 349-355, 356-361, 368-373, 375-376, 377, 378-387, 462, 505, 536, 574, 648, 687

43. Draw inferences or make predictions from graphs. **Stanford 9**

- Scattergram
- Stem-and-leaf graph
- Line graph
- Histogram
- Box-and-whisker graph

Page or Location: 397-403, 411-414, 415-419, 420-425, 430-439, 538-540, 656

44. Determine correlation given a set of data. **Stanford 9**

- Identifying a line equation that best fits data points in scattergram
- Identifying a line equation that best fits a set of data

Page or Location: 404-410, 432, 437, 439, 518

45. Identify the effect on mean, median, mode, and range when a set of data is changed. **Stanford 9**

Pages or Locations: 396

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46. Predict outcomes for simple events, given the probabilities. ***Stanford 9***
Page or Location: 342-348, 505, 536, 574, 648, 687
47. Predict outcomes of compound events, given the probabilities. ***Stanford 9***
Page or Location: 356-361, 368-373, 462, 505, 536, 574, 687
48. Estimate probabilities, given experimental data or graphs. ***Stanford 9***
Page or Location: 349-355, 374-375, 380, 381, 383, 384
49. Find probabilities, given graphs of probability distributions or tables of outcomes. ***Stanford 9***
Page or Location: 349-355, 374-375

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Stanford Achievement Test, Ninth Edition Task 1 objectives not included in this course:

- Make a prediction from a statistical sample. (addressed in Algebra II)
- Solve problems involving normal distributions. (addressed in Algebra II)
- Find measures of corresponding parts of similar figures. (addressed in Geometry)
- Deduce the measure of an angle in a polygon from given assumptions. (addressed in Seventh Grade, Eighth Grade, and Introduction to Algebra)
- Identify geometric models that represent problem situations. (addressed in Seventh Grade and Introduction to Algebra)
- Deduce the length of a side of a polygon from given assumptions. (addressed in Seventh Grade, Eighth Grade, and Introduction to Algebra)
- Identify the coordinates of transformation, given the endpoints of a segment. (addressed in Seventh Grade, Eighth Grade, and Introduction to Algebra)
- Given two sides of a right triangle and a trigonometry table, find the measure of a missing angle. (addressed in Geometry)
- Read and interpret the graph of a trigonometric function. (addressed in Algebra II)
- Solve problems involving sequences with recurrence relations. (addressed in Algebra II)
- Solve problems involving infinite sequences. (addressed in Algebra II)
- Solve problems involving enumeration. (addressed in Algebra II)
- Identify the results of an algorithm. (addressed in Algebra II)