

**Alabama Introduction to Algebra
to CORD Bridges to Algebra and Geometry, 2nd Edition
Introduction to Algebra**

The Introduction to Algebra category described in this document continues the transition between arithmetic and algebra. Content standards focus on exploration of fundamental algebraic concepts. Proficiency with concepts and operations involving rational numbers and expressions is an integral part of this course category. Students gain experience in using laws of exponents, using ratios and proportions to solve problems, and simplifying irrational numbers.

Coordinate plane concepts in this category include midpoint, slope, and length of segments; identifying and graphing simple linear functions; and transformations. Algebraic concepts include solving linear equations and simplifying polynomials as well as determining rules that represent patterns or functions.

It is important that the instructional strategies used are designed to stimulate student learning, consider students' learning styles, develop problem-solving skills, and are developmentally appropriate. Students should participate in calculator and computer activities designed to increase understanding of algebraic concepts.

Local school systems may offer this course content in the seventh or eighth grade. Other courses, such as Technical Mathematics, may be substituted for Introduction to Algebra provided these courses contain the core content of Introduction to Algebra.

Introduction to Algebra

**NUMBER SENSE
NUMBER SYSTEMS
NUMBER THEORY**

CONTENT STANDARDS

Students will

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

Page or Location: 4, 129, 247, 553, 554

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2. Demonstrate proficiency with operations on integers and rational numbers.

Page or Location: 140-147, 148-153, 162-167, 168-175, 236-240, 241-246, 254-260, 261-265, 266-272

3. Apply properties of real numbers.

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

Page or Location: 24-28, 33, 36-41, 48, 58, 96, 114, 140-145, 152, 157, 186-191, 192-196, 199, 206

4. Recognize, simplify, and use irrational numbers.

Page or Location: 553-556, 561,

5. Write and use ratios to compare one quantity with another.

Page or Location: 294-298, 299-303, 338-339, 344, 345, 500, 542, 685

6. Use ratios and proportions in problem solving.

Page or Location: 304-310, 336, 338-339, 344, 354-360, 367-371, 376, 380, 386, 410, 493, 563, 614, 661, 685

7. Recognize percents as ratios.

Page or Location: 348

8. Solve percent problems.

Examples: base, rate, percentage, percent of increase or decrease

Page or Location: 354-360, 362-366, 367-371, 374-380, 381-385, 386-388, 391-392, 396-397, 410, 418, 447, 465, 472, 487, 493, 500, 510, 534, 583, 598, 614, 627, 661-662

9. Demonstrate proficiency in simplifying rational number expressions using the order of operations.

Page or Location: 236-240, 254-260, 261-265, 266-270, 290, 298, 315, 326, 360, 371, 380, 418, 447, 472, 500

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10. Demonstrate proficiency in the application of number theory concepts.

- Primes
- Factors
- Multiples
- Divisibility
- Least common multiple
- Greatest common factor

Page or Location: 238-240, 247-251, 254-260, 291

11. Demonstrate proficiency in converting between decimal notation and scientific notation.

Page or Location: 536-541, 603, 656

12. Apply the laws of exponents to simplify expressions containing natural number exponents.

Page or Location: 524-529, 530-534

13. Recognize absolute value as distance from zero on the number line.

Page or Location: 131

14. Use problem-solving strategies effectively. *Stanford 9*

- Using objects
- Drawing a picture
- Using guess and check
- Making an organized list
- Writing an equation
- Solving a simpler problem
- Making a table or chart
- Looking for a pattern
- Using logical reasoning
- Working backward
- Using formulas

Page or Location: 49-52; also see features “Problem Solving: Using the Four Step Plan” pages 53, 103, 165, 200, 258, 306, 377, 422, 476, 546, 609, 652; “Practice and Apply” exercises at the end of each lesson; “Cumulative Problem Solving” exercises throughout each chapter,

**Alabama Introduction to Algebra
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and "Chapter Assessment" exercises at the end of
each chapter.**

**GEOMETRY
SPATIAL SENSE
MEASUREMENT**

15. Apply properties of plane and solid geometric figures to solve problems.

Stanford 9

- Triangles
- Quadrilaterals
- Regular polygons
- Parallel and perpendicular lines
- Circles
- Rectangular prisms
- Pyramids
- Cones
- Spheres

Page or Location: 217, 221, 233, 336, 388, 473-479, 480-487, 488-494,
584-592, 605-608, 609, 649, 650-656, 657-663,
664-670, 671-679, 680-686

16. Apply the Pythagorean Theorem.

Page or Location: 557-565, 570-573, 574-575, 598, 670, 685

17. Deduce measures of angles in polygons from given assumptions.

Stanford 9

Examples: interior, exterior

Page or Location: 220, 474-479, 482-486, 590, 670

18. Deduce lengths of the sides of polygons from given assumptions.

Stanford 9

Page or Location: 217-218, 221, 233, 486, 555, 557-565, 570-573,
574-575, 584-589, 599-602, 612-613, 615-621,
638-639, 670, 685

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19. Given the formulas, use perimeter, area, surface area, circumference, or volume of geometric figures to solve problems. **Stanford 9**

Page or Location: 50-51, 217-218, 221, 224-226, 233, 605-614, 615-621, 622-629, 638-639, 650-656, 657-663, 664-670, 671-678, 680-687, 687-689, 689-690, 691-692, 693-694

20. Demonstrate proficiency in using vocabulary and basic concepts related to the coordinate plane.

- x and y -axes
- Origin
- Point location

Page or Location: 400-404, 410, 456, 493, 621, 649

21. Determine midpoints and lengths of line segments given coordinates in the Cartesian plane. **Stanford 9**

Page or Location: 404, 410, 649

22. Identify coordinates of translations, rotations, and reflections. **Stanford 9**

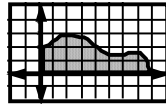
Page or Location: 495-500, 501-505, 506-512, 521, 621, 649, 678, 685

23. Graph linear functions in the form $y = mx + b$ on the Cartesian plane.

Page or Location: 419-427, 428-432, 433-438, 443-448, 453-455, 456-457, 563, 621, 662, 677

24. Estimate the area under a curve graphed on the Cartesian coordinate plane. **Stanford 9**

Example:



Page or Location: Not covered

25. Determine the maximum or minimum points of a graph. **Stanford 9**

Example:



maximum point (5, 3)

minimum point (-1, -2)

Page or Location: Not covered

26. Determine slopes and y -intercepts of lines.

- Given equations of the form $y = mx + b$
- Given graphs

Page or Location: 413-418, 419-428, 456-457, 542, 563, 598

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27. Identify graphs that represent data given in a table. ***Stanford 9***
Page or Location: 405-406, 408, 410-412, 426
28. Identify equations of functions that represent data given in a table.
Stanford 9
Page or Location: 439-441, 446
29. Use scale drawings and geometric models to solve problems. ***Stanford 9***
Page or Location: See Lessons 1.4, 1.6, 3.2, 3.5, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 6.3, 6.4, 6.6, 8.2, 9.3, 9.4, 10.6, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 12.2, 12.3, 12.4, 12.5, and 12.6

PATTERNS

FUNCTIONS

ALGEBRA

30. Describe and represent relationships with tables, graphs, and rules.
Page or Location: Many opportunities are contained in each chapter, for example see Lessons 2.1, 5.1, 5.3, 5.4, 5.5, 5.7, 6.1, 6.3, 7.5, 7.6, 8.5, 9.6, 9.7, 9.8, 10.4, 11.2, 11.3, 11.4, 11.6, 12.4, and 12.6; and Math Lab Activities on pages 180-181, 226-228, 288-289, 338-339, 339-341, 341-343, 391-392, 393-395, 453-455, 566-568, 630-631, 635-637, 687-689, 689-690, and 691-692.
31. Make predictions from data in a table. ***Stanford 9***
Page or Location: 311-315, 316-321, 322-326, 327-332, 333-337, 339-341, 341-343, 344-345, 389-390, 432, 447, 465, 478, 590, 656, 685
32. Determine rules that represent patterns or functions.
Page or Location: 52, 90, 163, 216, 237, 282, 336, 484, 549, 578-583, 590
33. Evaluate algebraic expressions. ***Stanford 9***
Page or Location: 16-21, 24, 25, 28, 33, 36, 37, 56, 66, 75, 79, 90, 113, 114, 139, 145, 151, 164, 166, 169, 172, 196, 208, 216, 246, 259, 264, 282, 320, 326, 360, 371, 380, 447, 472, 500, 549
34. Determine equations or inequalities that represent problem situations.
Stanford 9
Page or Location: 186-191, 192-197, 198-202, 203-210, 211-216, 232-233, 273-277, 278-284, 367-373, 374-380,

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381-388, 428-432, 433-438, 487, 505, 510, 511, 534,
563, 583, 614, 649, 677

35. Solve simple linear equations. *Stanford 9*

Page or Location: 186-191, 192-197, 198-202, 203-210, 211-216,
232-233, 240, 257, 259, 264, 265, 269, 270, 282, 290,
298, 304-310, 320, 336, 344, 353, 366, 371, 380, 410,
418, 425, 447, 478, 529, 556, 590, 598, 614, 649, 670

36. Simplify and combine polynomials.

Page or Location: 37, 79, 203-208, 315, 631-634, 631-634

37. Use the distributive axiom to factor polynomials.

Page or Location: 38-41

**PROBABILITY
STATISTICS
DISCRETE MATHEMATICS**

38. Collect, organize, and describe data.

Page or Location: 70-75, 76-79, 80-84, 85-90, 91-99, 100-107, 108-116,
122-125, and see also "Math Labs" at the end of each
chapter

39. Present data in graphical form.

- Scattergram
- Bar graph
- Circle graph
- Line graph
- Picture graph

Page or Location: 70-75, 76-79, 80-84, 85-90, 91-99, 100-107, 108-116,
117-118, 118-120, 120-121, 122-125, 133, a59, 167,
191, 221, 246, 265, 309, 357, 358, 359, 385, 396, 614

40. Interpret data and draw inferences from tables, charts, and graphs.

Stanford 9

Page or Location: 84, 91-99, 100-107, 114-116, 122, 125, 128, 129, 133,
138, 159, 160, 191, 221, 246, 627

41. Compute and use measures of central tendency to analyze statistical data.

Stanford 9

- Mean

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- Median
- Range
- Mode

Page or Location: 70-75, 76-79, 80-84, 94-95, 106-107, 118-120, 122-123,
133, 145, 167, 170-171, 172, 176-178, 178-180, 183,
191, 221, 246, 265, 277, 326, 332, 556, 583, 602, 685

42. Demonstrate an understanding of probability. *Stanford 9*

- Simple events
- Compound events

Page or Location: 311-315, 316-321, 322-326, 327-332, 333-337,
339-341, 341-343, 344-345, 360, 389-390, 432, 447,
465, 478, 583, 590, 656, 685

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

- Solve equations with radicals. (addressed in Algebra I)
- Solve inequalities. (addressed in Algebra I)
- Make a prediction from a statistical sample. (addressed in Algebra II)
- Determine a correlation, given a set of data. (addressed in Algebra I)
- Identify the effect on the mean, median, or range of a set of data. (addressed in Algebra I)
- Estimate probability, given experimental data or a graph. (addressed in Algebra I)
- Find probability, given a graph of probability distributions or table of outcomes. (addressed in Algebra I)
- Solve problems involving normal distributions. (addressed in Algebra II)
- Identify the effects of parameter changes on a function. (addressed in Algebra I)
- Find measures of corresponding parts of similar figures. (addressed in Geometry)
- Find the area of the rectangle or triangle, given the coordinates of the vertices. (addressed in Algebra I)
- Find the circumference of a circle, given the endpoints of a diameter or radius. (addressed in Algebra I)
- Find the dimensions of a polygon, given the coordinates of a polygon. (addressed in Algebra I)
- 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)