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Algebra

Introduction Algebra

Introduction Algebra, 3rd ed. CD Lecture Series (Martin-Gay)
Prentice Hall, 2007
CD-ROM 512.9 IN8i pt. 1-5
*Pt. 1 Chapter R – Pre-algebra review
 ~R.1 Factors and the Least Common Multiple
 ~R.2 Fractions
 ~R.3 Decimals and Percents
Chapter 1 – Real numbers & introduction to algebra
 ~1.1 Tips for Success in Mathematics
 ~1.2 Symbols and Sets of Numbers
 ~1.3 Exponents, Order of Operations, & Variable Expressions
 ~1.4 Adding Real Numbers
 ~1.5 Subtracting Real Numbers
 ~1.6 Multiplying and Dividing Real Numbers
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 ~2.3 Further Solving Linear Equations
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 ~2.5 Formulas and Problem Solving
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 ~4.4 Factoring Trinomials of the Form $ax^2 + bx + c$ by Grouping
 ~4.5 Factoring Perfect Square Trinomials and the Difference of Two Squares
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~6.2 Graphing Linear Equations
~6.3 Intercepts
~6.4 Slope and Rate of Change
~6.5 Equations of Lines
~6.6 Introduction to Functions
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Chapter 7 – Systems of equations
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~7.4 Systems of Linear Equations and Problem Solving

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Chapter 9 - Quadratic equations
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~9.2 Solving Quadratic Equations by Completing the Square
~9.3 Solving Quadratic Equations by the Quadratic Formula
~9.4 Graphing Quadratic Equations in Two Variables

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**College Algebra**

Video lectures on CD: to accompany College Algebra, 3rd ed. (Beecher/Bittinger/Penna)

Pearson/Addison Wesley, 2008

CD-ROM 512.9 V668ca pt. 1-9

*Pt. 1 Chapter R – Basic Concepts of Algebra
  R.1 The Real-Number System
  R.2 Integer Exponents, Scientific Notation, & Order of Operations
  R.3 Addition, Subtraction, and Multiplication of Polynomials
R.4 Factoring
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*Pt. 2 Chapter 1 – Graphs, Functions, and Models
  1.1 Introduction to Graphing
  1.2 Functions and Graphs
  1.3 Linear Functions, Slope, and Applications
  1.4 Equations of Lines and Modeling
  1.5 More on Functions
  1.6 The Algebra of Functions
  1.7 Symmetry and Transformations

*Pt. 3 Chapter 2 – Functions, Equations, and Inequalities
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  2.3 Quadratic Equations, Functions, and Models
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  3.2 Graphing Polynomial Functions
  3.3 Polynomial Division; The Remainder and Factor Theorems
  3.4 Theorems about Zeros of Polynomial Functions
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*Pt. 5 Chapter 4 – Exponential and Logarithmic Functions
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  5.4 Matrix Operations
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  5.6 Determinants and Cramer’s Rule
  5.7 Systems of Inequalities and Linear Programming
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6.3 The Hyperbola
6.4 Nonlinear Systems of Equations and Inequalities

*Pt. 8 Chapter 7 (7.1 – 7.4) - Sequences, Series, and Combinatorics
  7.1 Sequences and Series
  7.2 Arithmetic Sequences and Series
  7.3 Geometric Sequences and Series
  7.4 Mathematical Induction

*Pt. 9 Chapter 7 (7.5 – 7.8) - Sequences, Series, and Combinatorics
  7.5 Combinatorics: Permutations
  7.6 Combinatorics: Combinations
  7.7 The Binomial Theorem
  7.8 Probability

Pre-calculus & Calculus

Pre-calculus

Pre-calculus, Mathematics Instructional DVD Series (Larson/Hostetler)
Houghton Mifflin, 2007

*For use with: Pre-calculus, 7th ed., Pre-calculus with Limits, Pre-calculus: A Concise Course
DVD 515 L329 P pt. 1-11

*Pt. 1 Chapter 1 – Functions and Their Graphs
  ~1.1 Rectangular Coordinates
  ~1.2 Graphs of Equations
  ~1.3 Linear Equations in Two Variables
  ~1.4 Functions
  ~1.5 Analyzing Graphs of Functions
  ~1.6 A Library of Functions
  ~1.7 Transformations of Functions
  ~1.8 Combinations of Functions: Composite Functions

*Pt. 2 Chapter 1 – Functions and Their Graphs
  ~1.9 Inverse Functions
  ~1.10 Mathematical Modeling and Variation

Chapter 2 – Polynomial and Rational Functions
  ~2.1 Quadratic Functions and Models
  ~2.2 Polynomial Functions of Higher Degree
  ~2.3 Polynomial and Synthetic Division
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~5.5 Multiple-Angle and Product-to-Sum Formulas
~5.6 Law of Sines (Precalculus: A Concise Course)
~5.7 Law of Cosines (Precalculus: A Concise Course)

Chapter 6 – Additional Topics in Trigonometry (Precalculus and Precalculus with Limits)

* Chapter 6 Precalculus: A Concise Course is located on discs 9 and 10 of the DVD set.
~6.1 Law of Sines (Precalculus and Precalculus with Limits)
~6.2 Law of Cosines (Precalculus and Precalculus with Limits)
~6.3 Vectors in the Plane (Precalculus and Precalculus with Limits)

*Pt. 7 Chapter 6 – Additional Topics in Trigonometry (Precalculus and Precalculus with Limits)
~6.4 Vectors and Dot Products
~6.5 Trigonometric Form of a Complex Number

Chapter 7 - Systems of Equations and Inequalities (Precalculus and Precalculus with Limits)
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~7.3 Multivariable Linear Systems
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~7.5 Systems of Inequalities
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*Pt. 8 Chapter 8 – Matrices and Determinants (Precalculus and Precalculus with Limits)
~8.1 Matrices and Systems of Equations
~8.2 Operations with Matrices
~8.3 The Inverse of a Square Matrix
~8.4 The Determinant of a Square Matrix
~8.5 Applications of Matrices and Determinants

Chapter 9 – Sequences, Series, and Probability (Precalculus and Precalculus with Limits)

~9.1 Sequences and Series
~9.2 Arithmetic Sequences and Partial Sums
~9.3 Geometric Sequences and Series

*Pt. 9 Chapter 9 – Sequences, Series, and Probability (Precalculus and Precalculus with Limits)

~9.4 Mathematical Induction
~9.5 The Binomial Theorem
~9.6 Counting Principles
~9.7 Probability

Chapter 10 – Topics in Analytic Geometry (Precalculus and Precalculus with Limits)

Chapter 6 – Topics in Analytic Geometry (Precalculus: A Concise Course)

~10.1/6.1 Lines
~10.2/6.2 Introduction to Conics: Parabolas
~10.3/6.3 Ellipses

*Pt. 10 Chapter 10 – Topics in Analytic Geometry (Precalculus and Precalculus with Limits)

Chapter 6 – Topics in Analytic Geometry (Precalculus: A Concise Course)

~10.4/6.4 Hyperbolas
~10.5 Rotation of Conics (Precalculus and Precalculus with Limits)
~10.6/6.5 Parametric Equations
~10.7/6.6 Polar Coordinates
~10.8/6.7 Graphs of Polar Coordinates
~10.9/6.8 Polar Equations of Conics

Chapter 11 – Analytic Geometry in Three Dimensions (Precalculus with Limits)

~11.1 The Three-Dimensional Coordinate System

*Pt. 11 Chapter 11 – Analytic Geometry in Three Dimensions (Precalculus with Limits)

~11.2 Vectors in Space
~11.3 The Cross Products of Two Vectors
~11.4 Lines and Planes in Space

Chapter 12 – Limits and an Introduction to Calculus (Precalculus with Limits)

~12.1 Introduction to Limits
~12.2 Techniques for Evaluating Limits
~12.3 The Tangent Line Problem
~12.4 Limits at Infinity and Limits of Sequences
~12.5 The Area Problem
Calculus

Interactive Calculus, ver. 2.0
Houghton Mifflin, 1998
CD-ROM 515.15 In8 1998
*Accompanies the book Calculus with analytic geometry, 6th ed.

Calculus DVD Program (Larson, Hostetler, Edwards)
Houghton Mifflin, 2006
*To be used in conjunction with: Calculus (8th ed.) / Larson, Hostetler, and Edwards or Calculus of a single variable (8th ed.) / Larson, Hostetler, and Edwards.
DVD 515 C126ca pt. 1-12
*Pt. 1 Chapter P – Preparation for Calculus
~P.1 Graphs and Models
~P.2 Linear Models and Rates of Change
~P.3 Functions and Their Graphs
~P.4 Fitting Models to Data
Chapter 1 – Limits and Their Properties
~1.1 A Preview of Calculus
~1.2 Finding Limits Graphically and Numerically
*Pt. 2 Chapter 1 – Limits and Their Properties
~1.3 Evaluating Limits Analytically
~1.4 Continuity and One-Sided Limits
~1.5 Infinite Limits
Chapter 2 – Differentiation
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~2.2 Basic Differentiation Rules and Rate of Change
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~2.3 The Product and Quotient Rules and Higher-Order Derivatives
~2.4 The Chain Rule
~2.5 Implicit Differentiation
~2.6 Related Rates
Chapter 3 – Applications of Differentiation
~3.1 Extrema on an Interval
~3.2 Rolle’s Theorem and the Mean Value Theorem
~3.3 Increasing and Decreasing Functions and the First Derivative Test
*Pt. 4 Chapter 3 – Applications of Differentiation
~3.4 Concavity and the Second Derivative Test
~3.5 Limits at Infinity
~3.6 A Summary of Curve Sketching
~3.7 Optimization Problems
~3.8 Newton’s Method
~3.9 Differentials
*Pt. 5 Chapter 4 – Integration
~4.1 Antiderivatives and Indefinite Integration
~4.2 Area
~4.3 Riemann Sums and Definite Integrals
~4.4 The Fundamental Theorem of Calculus

*Pt. 6 Chapter 4 – Integration
~4.5 Integration by Substitution
~4.6 Numerical Integration

Chapter 5 – Logarithmic, Exponential, and Other Transcendental Functions
~5.1 The Natural Logarithmic Function: Differentiation
~5.2 The Natural Logarithmic Function: Integration
~5.3 Inverse Functions
~5.4 Exponential Functions: Differentiation and Integration

*Pt. 7 Chapter 5 – Logarithmic, Exponential, and Other Transcendental Functions
~5.5 Bases Other Than e and Applications
~5.6 Inverse Trigonometric Functions: Differentiation
~5.7 Inverse Trigonometric Functions: Integration
~5.8 Hyperbolic Functions

Chapter 6 – Differential Equations
~6.1 Slope Fields and Euler’s Method
~6.2 Differential Equations: Growth and Decay

*Pt. 8 Chapter 6 – Differential Equations
~6.3 Separation of Variables and the Logistic Equation
~6.4 First-Order Linear Differential Equations

Chapter 7 – Applications of Integration
~7.1 Area of a Region between Two Curves
~7.2 Volume: The Disk Method
~7.3 Volume: The Shell Method
~7.4 Arc Length and Surfaces of Revolution

Chapter 8 – Integration Techniques, L’Hopital’s Rule, and Improper Integrals
~8.2 Integration by Parts
~8.4 Trigonometric Substitution

*Pt. 9 Chapter 8 – Integration Techniques, L’Hopital’s Rule, and Improper Integrals
~8.5 Partial Fractions
~8.7 Indeterminate Forms and L’Hopital’s Rule
~8.8 Improper Integrals

Chapter 9 – Infinite Series
~9.6 The Ratio and Root Tests
~9.8 Power Series
~9.9 Representation of Functions by Power Series
~9.10 Taylor and Maclaurin Series

*Pt. 10 Chapter 10 – Conics, Parametric Equations, and Polar Coordinates
~10.2 Plane Curves and Parametric Equations
~10.3 Parametric Equations and Calculus
~10.5 Area and Arc Length in Polar Coordinates

Chapter 11 – Vectors and the Geometry of Space
~11.2 Space Coordinates and Vectors in Space
~11.3 The Dot Product of Two Vectors
~11.4 The Cross Product of Two Vectors in Space
*Pt. 11 Chapter 11 – Vectors and the Geometry of Space
    ~11.5 Lines and Planes in Space
Chapter 12 – Vector-Valued Functions
    ~12.2 Differentiation and Integration of Vector-Valued Functions
    ~12.4 Tangent Vectors and Normal Vectors
Chapter 13 – Functions of Several Variables
    ~13.3 Partial Derivatives
    ~13.7 Tangent Planes and Normal Lines
Chapter 14 – Multiple Integration
    ~14.2 Double Integrals and Volume
*Pt. 12 Chapter 14 – Multiple Integration
    ~14.7 Triple Integrals in Cylindrical and Spherical Coordinates
Chapter 15 – Vector Analysis
    ~15.2 Line Integrals
    ~15.4 Green’s Theorem
    ~15.8 Stoke’s Theorem

Study, Teaching, & Career Development

Mathematics for Elementary Teachers 2001
John Wiley & Sons, 2001
CD-ROM 510 M42E 2001

Stand and Deliver
Warner Bros. Pictures, 1998
VC 373.19 ST24 (103 min.)

Summary: Story of Jaime Escalante, a math teacher at East Los Angeles’ Garfield High School, who refuses to write off his inner-city students as losers. Escalante pushes and inspires 18 students who were struggling with math to become math whizzes.
Other Mathematical Topics

Mathematics of Architecture: building by numbers
*Films for the Humanities & Sciences, 2005*
DVD 720 M42MA (25 min.)

**Summary:** This film demonstrates the application of mathematics to architectural designs, from Palladio's harmoniously proportionate villas to the chaotic architecture of Parc de la Villette in Paris, designed by architect Bernard Tschumi.

Manuals

**Basic College Mathematics, 2nd ed.** (Martín-Gay)
*Prentice Hall, 2003*
MAN 510.2 B292

**Beginning Algebra, 6th ed.** (Lial, Miller, Hornsby)
*HarperCollinsPublishers, 1992*
MAN 512 L613B 1992

**Calculus with Analytic Geometry, 5th ed.** (Larson, Holstetler, with the assistance of Heyd)
*D.C. Heath, 1994.*
MAN 515.15 L329C

**Calculus with Analytic Geometry, alternate 5th ed.** (Larson, Holstetler, Edwards; with the assistance of Heyd)
*D.C. Heath, 1994.*
MAN 515.15 L329CA

**Finite Mathematics and Calculus with Applications, 4th ed.** (Lial, Miller, Greenwell)
*HarperCollins College Publishers, 1993*
MAN 510 L613F 1993

**Mathematics for Elementary Teachers: a contemporary approach** (Musser, Burger, Peterson)
*J. Wiley, 2001*
MAN 510 M976M 2001
Mathematics for Elementary Teachers: an activity approach (Bennett, Albert B., Ted Nelson)
Wm. C. Brown Publishers, 1992
MAN 510 B438MA

Study and Solutions Guide for Calculus, alternate 5th ed. (Heyd)
MAN 515.15 H511SA

Trigonometry, 4th ed. (McKeague)
Saunders College Publishing, 1999
MAN 516.24 M193T 1999

Computer Software

Derive 6
Texas Instruments, 2004
CD 512.1 D445 2004