# Annotated Instructor's Edition Second Edition Financial Algebra

**ADVANCED ALGEBRA WITH FINANCIAL APPLICATIONS** 



### Robert Gerver | Richard Sgroi



Australia • Brazil • Mexico • Singapore • United Kingdom • United States

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#### **MATH TOPICS**

Bimodal data Bivariate data Causal relationship Correlation Correlation coefficient Cumulative frequency Domain Explanatory, response, lurking variables Frequency distribution Independent and dependent variables Interpolation and extrapolation Linear regression analysis Linear regression equation Mean absolute deviation Mean deviation Measures of central tendency - mean, median, mode Normal curve Outliers

Percent Percentage Percentile Percentile rank Percentiles Range Raw scores Relative cumulative frequency Relative frequency Scatter plot Sigma notation Skewed data Spreadsheets and formulas Standard deviation Trend Univariate data Variance Z-scores

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#### MATH TOPICS

Antilogarithm Arithmetic sequence Change-of-base formula Common logarithm Compound interest Continuous compounding Exponential decay Exponential equations Exponential form Exponential growth Limits

#### Literal equations Logarithm Logarithmic equation Logarithmic form Natural logarithm One-to-one property of logarithms Patterns and conjectures Power property of logarithms Recursive and iterative thinking Spreadsheets and formulas

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#### **MATH TOPICS**

Average daily balance Cubic equation Cubic regression equation Exponential base e Exponential equations Linear equations Linear regression equation

#### Logarithms Mean Natural logarithms Percents Quadratic equation Quadratic regression equation Spreadsheets and formulas

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#### MATH TOPICS

onoru
Circle
Circumference
Common ratio
Conditional probability formula
Diameter
Domain
English Standard System
Exponential decay
Exponential depreciation
Exponential function
Exponential regression
Geometric progression
Geometric sequences
Independent events
Intersection point
Linear equations

#### Metric System Middle ordinate Projectile motion Proportions Quadratic equation Radius Ratios Slope Slope intercept form of a linear equation Spreadsheets and formulas Square root function System of linear equations System of linear, exponential equations Two-way tables Venn diagrams x-intercept, y-intercept

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#### MATH TOPICS Compound inequality Compound inequality notation Domain Inequalities Interval notation Linear equation

**MATH TOPICS** 

Apothem

Circumference

Literal equation

Percent

Percents

Perimeter

Exponential equation

Exponential regression equation

Linear regression equation

Cosine ratio

Area

**MATH TOPICS** Arithmetic sequence

Exponential functions Geometric sequence

Graphs of functions

Cusps

Domain

Literal expressions Percent Piecewise function Slope, intercept form of a linear equation Spreadsheets and formulas

Literal equations

Percent

Literal expressions Piecewise functions

Spreadsheets and formulas

#### Proportion Pythagorean theorem and its converse Regular polygons Similar triangles Sine ratio Spreadsheets Spreadsheets and formulas System of linear equations Tangent ratio Volume

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#### MATH TOPICS

Average
Bar chart
Candlestick chart
Converting fractions to percents
Cubic regression equation
Line graph
Linear equations

#### Linear regression equation Moving average Percent decrease Percent increase Proportion Quadratic regression equation Spreadsheets and formulas

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MATH TOPICS
Axis of symmetry
Bias
Completing the square method
Complex number
Complex roots
Experimental design
Hypothesis testing
Imaginary unit
Inequality constraints
Leading coefficient
Linear equation
Linear programming
Literal quadratic equation
Minimum, maximum

#### Objective function Parabola Quadratic equation Quadratic formula Random number tables Roots of a quadratic equation Roots, zeros of a quadratic equation Sampling Surveying System of linear equations System of linear, quadratic equations Unbiased estimators

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### New to this Edition

Note: The code "FA1E" refers to the first edition of *Financial Algebra* and the section number from the first edition follows.

#### Chapter 1 Discretionary Expenses

- **1-1** Categorizing Expenses—Discretionary vs. essential expenses measures of central tendency and frequency distributions
- **1-2** Vacation Travel Expenses—cumulative and relative frequency, percentiles
- **1-3** Entertainment Expenses—plays, movies, concerts, out to eat, video games, music downloads, sports events, amusement parks measures of spread
- **1-4** Vacation Destination Expenses—normal curve and z-scores
- **1-5** Personal Expenses—linear regression and scatterplots

#### Chapter 2 Banking Services

- **2-1** Checking Accounts FA1E 3-1
- **2-2** Reconcile a Bank Statement FA1E 3-2
- 2-3 Savings Accounts—intro arithmetic sequences with constant addition plus FA1E 3-3
- 2-4 Explore Compound Interest FA1E 3-4
- 2-5 Compound Interest Formula FA1E 3-5
- **2-6** Continuous Compounding limits of rational functions, plus FA1E 3-6
- 2-7 Future Value of Investments FA1E 3-7
- 2-8 Present Value of Investments FA1E 3-8
- **2-9** The Term of a Single Deposit Account—new section—logarithms plus
- **2-10** The Terms of a Systematic Savings Account new section—properties of logs

#### Chapter 3 Consumer Credit

- 3-1 Introduction to Consumer Credit FA1E 4-1
- 3-2 Loans FA1E 4-2
- 3-3 Student Loans—new section
- 3-4 Loan Calculations and Regression FA1E 4-3

- **3-5** Credit Cards FA1E 4-4
- **3-6** Credit Card Statement FA1E 4-5
- **3-7** Average Daily Balance FA1E 4-6

#### Chapter 4 Automobile Ownership

- **4-1** Classified Ads FA1E 5-1
- **4-2** Automobile Transactions FA1E 5-2
- **4-3** Automobile Insurance FA1E 5-4
- 4-4 Probability: The Basis of Insurance conditional probability, independent events, Venn diagrams –NEW SECTION
- 4-5 Linear Automobile Depreciation FA1E 5-5
- **4-6** Historical and Exponential Depreciation geometric sequences plus FA1E 5-6
- 4-7 Driving Data FA1E 5-7
- **4-8** Driving Safety Data projectile motion quadratics plus FA1E 5-8
- 4-9 Accident Investigation Data FA1E 5-9

#### Chapter 5 Employment Basics

- **5-1** Look for Employment FA1E 6-1
- 5-2 Pay Periods and Hourly Rates—geometric sequence-penny doubled every day plus FA1E 6-2
- 5-3 Commissions, Royalties, and Piecework Pay FA1E 6-3
- **5-4** Employee Benefits FA1E 6-4
- 5-5 Social Security and Medicare FA1E 6-5

#### Chapter 6 Income Taxes

- 6-1 Tax Tables, Worksheets, and Schedules FA1E 7-1
- 6-2 Modeling Tax Schedules FA1E 7-2
- 6-3 Income Statements FA1E 7-3
- 6-4 Forms 1040EZ and 1040A FA1E 7-4
- 6-5 Form 1040 and Schedules A and B FA1E 7-5

#### **Chapter 7** Independent Living

- 7-1 Finding a Place to Live FA1E 8-1
- 7-2 Reading a Floor Plan FA1E 8-2
- 7-3 Mortgage Application Process FA1E 8-3
- **7-4** Purchasing a Home FA1E 8-4
- 7-5 Mortgage Points new section
- **7-6** Rentals, Condominiums, and Cooperatives FA1E 8-5
- **7-7** Home Maintenance and Improvement—new section: trig and pythag, similar triangles

#### Chapter 8 The Stock Market

- 8-1 Business Organization FA1E 1-1
- 8-2 Stock Market Data FA1E 1-2
- 8-3 Stock Market Data Charts FA1E 1-3
- **8-4** Simple Moving Averages FA1E 1-4
- 8-5 Stock Market Ticker FA1E 1-5
- 8-6 Stock Transactions FA1E 1-6
- 8-7 Stock Transaction Fees FA1E 1-7
- 8-8 Stock Splits FA1E 1-8
- 8-9 Dividend Income FA1E 1-9

#### Chapter 9 Modeling a Business

- **9-1** Inventions—surveying, critiquing experimental designs, bias new section
- **9-2** Market Research—unbiased estimators, sampling, types of samples, critiquing experimental design methods new section

- **9-3** Supply and Demand FA1E 2-3
- **9-4** Fixed and Variable Expenses FA1E 2-4
- **9-5** Graphs of Expense and Revenue Functions completing the square plus FA1E 2-5
- 9-6 Breakeven Analysis FA1E 2-6
- **9-7** The Profit Equation –add complex roots plus FA1E 2-7
- 9-8 Mathematically Modeling a Business FA1E 2-8
- **9-9** Optimal Outcomes— new section on linear programming

#### Chapter 10 Planning for Retirement

- **10-1** Retirement Income from Savings FA1E 9-1
- **10-2** Social Security Benefits FA1E 9-2
- 10-3 Pensions FA1E 9-3
- **10-4** Life Insurance FA1E 9-4
- **10-5** Diversification Of Investments—new section

#### Chapter 11 Prepare a Budget

- **11-1** Utility Expenses FA1E 10-1
- **11-2** Electronic Utilities FA1E 10-2
- **11-3** Charting a Budget FA1E 10-3
- **11-4** Cash Flow and Budgeting—introduction to matrices plus FA1E 10-4
- **11-5** Budget Matrices—new section—operations with matrices

### Inside the Student Edition



without questions. Did you miss the chance to make more money because you were being overly cautious? Was the investment too risky? Did you risk losing principal by investing in something that may not have had a sound foundation? Investors struggle with these questions every day. The stock market is a forum in which the investment risk/reward balance is put to the test. Will the market advance? Will the market decline? No one can be certain. Will the corporations you choose flourish, grow, and succeed, or falter? With a strong knowledge of the stock market, corporations, and investment strategies, you as an investor can make decisions that are based on experience, data, trends, and mathematics.

"This information is interesting and relevant! Showing real-world relevance is always a good lead into the section."

A relevant quote and chapter introduction set the stage for the topics covered in the chapter.

#### Really?

Corporations sometimes choose names that are personal, humorous, historical, or psychological. Many are acromyns, where a new word is created by the first effects of several words. Below are de-thered some corporations and how their names were established. Amazon xore has a corporate name because the acadatraccam. Its founder selected Amazon as a corporate name because that apart hat begans with a ''s othat alphabetically, it would appear at the top of a list.

of a list. Coca-Cola is a name that has its origins in the ingredients of the product—coca leaves and kola nuts. The founder, John Pemberton, chang

the "K" in kola to a "C" for appearance purpose. Addata founder, Adaph (Adl) Dader. edited to the state of the state of the constraint of the state of the state of the addata founder, Adaph (Adl) Dader. edits van exceed by Pieter Combyr, who originally vanied to use the name to the state of the state of the state of the add mining company, so he shortened it to e stay. Lacks is a corporation that makes automobile antiHelf devices. The name is a humorous adaptation of the word halack: Add is Ansmary Company. A her American Add is Ansmary Company. And is Ansmary Company. Add is Ansmary Company. Add is Add is Ansmary Company. Add is Add is Ansmary Company. Add is Add is Add is Add is Add is Add process was inverted in 1927 by law student Chester Carlson.



Really!

Really? Really! captures students' attention by discussing a fascinating real-life topic that relates to the chapter's content.

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### Structure Puts Math into Context



The best way to deal with credit card debt is to educate yourself.

Mark Rosen, Author

"An interesting introduction and a great metaphor for the section!"

Although it's easy to forget sometimes, a share is not a lottery ticket . . . it's part-ownership of a business.

Peter Lynch, American businessman, Investment strategist, and Philanthropist

Nobody ever lost money taking a profit. Bernard Baruch, Businessman

### The Essential Question helps focus attention on the big idea

What are social security and medicare?

How do people gain access to money they keep in the bank?

What is compound interest?

What information do you need to know before taking out a loan?

What information does a credit card statement give you?

How do revenue and expenses contribute to profit calculation? The Essential Question helps focus attention on the big idea of each section. You will be able to answer the question by the end of the section.

#### 8-3 Stock Market Data

Although it's easy to forget sometimes, a share is not a lottery ticket . . . it's part-ownership of a business —Peter Lynch, Am philanthropist

#### **Objectives**

· Interpret a stock bar chart. · Create a stock bar chart.

Interpret a stock candlestick chart.

Key Terms stock chart stock bar chart candlestick chart

· Create a stock candlestick chart

Warm-Up Wathin OD An item usually sells for X dollars. It is marked down to Y dollars. Interpret each of the following algebraic expressions in this context. a. |Y - X|b. |Y - X|/Xc. 100|Y - X|/X

#### How Can Stock Data Be Displayed?

Stock data can be presented in list form or in graphical form. The graphical form is known as a stock chart. These charts offer pictorial information on anything from a day's worth of data to multiyear data trends. Most stock charts present

also be used to show the market action on

multiple days.



8-3 Stock Market Data Charts 477 Each section begins with a discussion of terms and concepts related to the section topic.

"This book contains relevant and current information high school students need. The educational focus of today is on standards. This book allows both to be addressed."

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## When am I ever going to use this in real life?



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### **Ongoing Assessment and Review**







**Reality Check** provides specific suggestions for research opportunities, projects, and guest speakers to extend your learning experience. **Real Numbers: You Write the Story!** asks you to examine a graph and write a story focused around the graph's information, giving you an opportunity to be creative while at the same time sharpening your graph interpretation skills.



What's The Problem? provides you with a problem posing activity related to a chapter problem. You are given an equation or formula featured in the chapter, with numerical substitutions for each variable. You then have to think backwards and create the problem, using the numbers, that have a solution modeled by the given equation.

"Excellent activities that help connect math to the real world."

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Really? Really! Revisited continues the theme of the Really? Really! feature at the beginning of each chapter. In Really? Really! Revisited, you use mathematics to solve a problem or extension related to the Really? Really! theme.

#### Really? Really! Revisited

- Google is derived from the number googol, which is a 1 with 100 zeros following it. This is equivalent to 10°. Despite the original accidental change in spelling (but not promociation), the name will clicits the ide of something very large. How large is 10°° Three is a googol of anything on the planet Lefs take a look at some surprisingly large and surprisingly small numbers. Given that 1,000,000 pennies stacked one on top of another reaches about 1 mile high, how they loog objennies reached To get an idea of the "power" of exponents, investigate a famous problem in How more times would you have to fold a piece of paper so it reached from Earth to the Sin, approximately 50 million miles? A ream of paper (500 sheets) is 2 inches thick. What is the thickness of one sheet of paper?
  - sheet of paper? 2. Take a sheet of paper and fold it as many times as you can. For the rest of the problem you will have to imagine that you could continually fold the piece of paper. 3. Convert 93 million miles into inches.

  - 4. Converting the matter start matter that the start of the start o
  - many blobs would it take to reach to the sun? You were probably unable to fold the paper more than six or seven times, so you had to imagine the doubling of the thickness mathematically. After viewing the thickness of the paper after six folds, are you surprised at how few folds it will take the thickness of the paper to reach the sun? The "power" of 2 is amazing!

#### Applications

- Nick and Matt are partners in a local health food store. They needed \$73,000 to start the business. They invested in the ratio 37, Nick to Matt.
   How much money did each invest?
   What percent of the business was owned by Matt? Round to the nearest tenth of a precent.
- temb of a percent. 2. Tom purchased shares of DuPont for \$47.65 per share. He plans to sell the shares when the stock price rises 20%. At what price will be sell his shares? 3. The top three stareholders in a certain corporation call own or shares of stock. The corporation's ownership is represented by a total of x shares of stock. Express the percent of the corporation owned by the top three shareholders algebraically.
- stareholders algebraically.
  Maribel purchased 2000 shares of stock for 525.43 per share. She solid them for 541.10 per share. Encoded 2000 shares ber capital gain to the nearest tenth of a percent.
  A local bainstylist bought 450 shares of source commercise corporation for 533.50 per share. He solid he shares for 530.01 per share.
  a. What was here increase in the price per share? Round to the nearest the water stare and the total parchase performed for the 450 shares?
  c. What was the total selling price for the 450 shares?
  d. What was the percent capital gain for the 450 shares? Round to the nearest tenth of a percent.

"I love how it is tied to what started the chapter!"

"Great variety of problems that will prepare students for life outside of school!"

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Meaningful applications at the end of each chapter require you to apply concepts that were taught throughout the chapter.

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### Comprehensive Teaching and Learning Tools

#### Annotated Instructor's Edition 9781337271806

The Annotated Instructor's Edition keeps useful teaching and reference notes, helpful suggestions, and ready solutions at your fingertips.

#### **Financial Algebra Instructor Companion Website**

- Lesson plans
- PowerPoint slides for each lesson
- Workbook answers
- Solutions Manual Additional resources for use in the classroom or planning your curriculum

#### Computerized Testbank 9781337271905

An online testbank saves time in effectively assessing your students' understanding of chapter concepts. Simply edit, add, delete, or rearrange questions.

#### Practice Problems for Financial Algebra 9781337271820

The student workbook offers additional resources for mastering algebraic concepts within a financial context.

#### MindTap 9781337271851

MindTap® for Gerver and Sgroi's FINANCIAL ALGEBRA, Second Edition provides you with the tools you need to better manage your limited time – you can complete assignments whenever and wherever you are ready to learn with course material specially customized for you by your instructor and streamlined in one proven, easy-to-use interface. With an array of tools and apps – from note taking to flashcards—you'll get a true understanding of course concepts, helping you to achieve better grades and setting the groundwork for your future courses.

#### Website - www.cengage.com/financial\_alg2e

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