9th Edition

Contemporary Mathematics

FOR BUSINESS AND CONSUMERS

Robert Brechner and George Bergeman

CENGAGE

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

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. WCN 02-200-202

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. Due to electronic rights, some third party content may be suppressed from the eBook and/or eChapter(s). Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. Cengage Learning reserves the right to remove additional content at any time if subsequent rights restrictions require it.

BRIEF CONTENTS

Chapter 1
Whole Numbers 1

Chapter 2
Fractions 32

Chapter 3
Decimals 67

Chapter 4
Checking Accounts 95

Chapter 5
Using Equations to Solve Business Problems 128

Chapter 6
Percents and Their Applications in Business 161

Chapter 7
Invoices, Trade Discounts, and Cash Discounts 196

Chapter 8
Markup and Markdown 237

Chapter 9
Payroll 270

Chapter 10
Simple Interest and Promissory Notes 312

Chapter 11
Compound Interest and Present Value 350

Chapter 12
Annuities 380

Chapter 13
Consumer and Business Credit 420

Chapter 14
Mortgages 467

Chapter 15
Financial Statements and Ratios 499

Chapter 16
Inventory 552

Chapter 17
Depreciation 587

Chapter 18
Taxes 617

Chapter 19
Insurance 650

Chapter 20
Investments 685

Chapter 21
Business Statistics and Data Presentation 726

Appendix A
Answers to Odd-Numbered Exercises A-2

Index I-1

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. WCN 02-200-202

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. Due to electronic rights, some third party content may be suppressed from the eBook and/or eChapter(s).
Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. Cengage Learning reserves the right to remove additional content at any time if subsequent rights restrictions require it.

CONTENTS

Chapter 1: Whole Numbers 1

Section I: The Decimal Number System: Whole Numbers 2

1-1 Reading and writing.5 whole numbers in numerical and word form 2

1-2 Rounding whole numbers to a specified place value 4

Section II: Addition and Subtraction of Whole Numbers 7

1-3 Adding whole numbers and verifying your answers 7

1-4 Subtracting whole numbers and verifying your answers 9

Section III: Multiplication and Division of Whole Numbers 14

1-5 Multiplying whole numbers and verifying your answers 15

1-6 Dividing whole numbers and verifying your answers 17

Chapter 2: Fractions 32

Section I: Understanding and Working with Fractions 33

2-1 Distinguishing among the various types of fractions 33

2-2 Converting improper fractions to whole or mixed numbers 34

2-3 Converting mixed numbers to improper fractions 35

2-4 Reducing fractions to lowest terms 36

2-5 Raising fractions to higher terms 38

Section II: Addition and Subtraction of Fractions 41

2-6 Determining the least common denominator (LCD) of two or more fractions 41

2-7 Adding fractions and mixed numbers 42

2-8 Subtracting fractions and mixed numbers 44

Section III: Multiplication and Division of Fractions 50

2-9 Multiplying fractions and mixed numbers 51

2-10 Dividing fractions and mixed numbers 53

Chapter 3: Decimals 67

Section I: Understanding Decimal Numbers 68

3-1 Reading and writing decimal numbers in numerical and word form 68

3-2 Rounding decimal numbers to a specified place value 70

Section II: Decimal Numbers and the Fundamental Processes 73

3-3 Adding and subtracting decimals 73

3-4 Multiplying decimals 74

3-5 Dividing decimals 75

Section III: Conversion of Decimals to Fractions and Fractions to Decimals 81

3-6 Converting decimals to fractions 81

3-7 Converting fractions to decimals 82

Chapter 4: Checking Accounts 95

Section I: Understanding and Using Checking Accounts 96

4-1 Opening a checking account and understanding how various forms are used 96

4-2 Writing checks in proper form 98

4-3 Endorsing checks by using blank, restrictive, and full endorsements 99

4-4 Preparing deposit slips in proper form 101

4-5 Using check stubs or checkbook registers to record account transactions 103

Section II: Bank Statement Reconciliation 109

4-6 Understanding the bank statement 109

4-7 Preparing a bank statement reconciliation 111

Chapter 5: Using Equations to Solve Business Problems 128

Section I: Solving Basic Equations 129

5-1 Understanding the concept, terminology, and rules of equations 129

5-2 Solving equations for the unknown and proving the solution 130

5-3 Writing expressions and equations from written statements 136

Section II: Using Equations to Solve Business-Related Word Problems 139

5-4 Setting up and solving business-related word problems by using equations 139

5-5 Understanding and solving ratio and proportion problems 143

Chapter 6: Percents and Their Applications in Business 161

Section I: Understanding and Converting Percents 162

6-1 Converting percents to decimals and decimals to percents 162

6-2 Converting percents to fractions and fractions to percents 164

Section II: Using the Percentage Formula to Solve Business Problems 167

6-3 Solving for the portion 168

6-4 Solving for the rate 170

6-5 Solving for the base 172

Section III: Solving Other Business Problems Involving Percents 177

6-6 Determining rate of increase or decrease 177

6-7 Determining amounts in increase or decrease situations 180

6-8 Understanding and solving problems involving percentage points 183

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. WCN 02-200-202

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. Due to electronic rights, some third party content may be suppressed from the eBook and/or eChapter(s). Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. Cengage Learning reserves the right to remove additional content at any time if subsequent rights restrictions require it.

Chapter 7: Invoices, Trade Discounts, and Cash Discounts 196

Section I: The Invoice 197

7-1 Reading and understanding the parts of an invoice 197

7-2 Extending and totaling an invoice 200

Section II: Trade Discounts—Single 204

7-3 Calculating the amount of a single trade discount 205

7-4 Calculating net price by using the net price factor, complement method 205

7-5 Calculating trade discount rate when list price and net price are known 206

Section III: Trade Discounts—Series 210

7-6 Calculating net price and the amount of a trade discount by using a series of trade discounts 210

7-7 Calculating the net price of a series of trade discounts by using the net price factor, complement method 211

7-8 Calculating the amount of a trade discount by using a single equivalent discount 212

Section IV: Cash Discounts and Terms of Sale 216

7-9 Calculating cash discounts and net amount due 217

7-10 Calculating net amount due, with credit given for partial payment 218

7-11 Determining discount date and net date by using various terms of sale dating methods 220

Chapter 8: Markup and Markdown 237

Section I: Markup Based on Cost 238

8-1 Understanding and using the retailing equation to find cost, amount of markup, and selling price of an item 240

8-2 Calculating percent markup based on cost 240

8-3 Calculating selling price when cost and percent markup based on cost are known 241

8-4 Calculating cost when selling price and percent markup based on cost are known 242

Section II: Markup Based on Selling Price 245

8-5 Calculating percent markup based on selling price 245

8-6 Calculating selling price when cost and percent markup based on selling price are known 246

8-7 Calculating cost when selling price and percent markup based on selling price are known 247

8-8 Converting percent markup based on cost to percent markup based on selling price, and vice versa 248

Section III: Markdowns, Multiple Operations, and Perishable Goods 252

8-9 Determining the amount of markdown and the markdown percent 252

8-10 Determining the sale price after a markdown and the original price before a markdown 252

8-11 Computing the final selling price after a series of markups and markdowns 254

8-12 Calculating the selling price of perishable goods 256

Chapter 9: Payroll 270

Section I: Employee's Gross Earnings and Incentive Pay Plans 271

9-1 Prorating annual salary on the basis of weekly, biweekly, semimonthly, and monthly pay periods 271

9-2 Calculating gross pay by hourly wages, including regular and overtime rates 272

9-3 Calculating gross pay by straight and differential piecework schedules 273

9-4 Calculating gross pay by straight and incremental commission, salary plus commission, and drawing accounts 275

Section II: Employee's Payroll Deductions 281

9-5 Computing FICA taxes, both social security and medicare, withheld from an employee's paycheck 281

9-6 Calculating an employee's federal income tax (FIT) withholding by the percentage method 283

9-7 Determining an employee's total withholding for federal income tax, social security, and Medicare using the combined wage bracket tables 286

Section III: Employer's Payroll Expenses and Self-Employed Person's Tax Responsibility 291

9-8 Computing FICA tax for employers and self-employment tax for self-employed persons 291

9-9 Computing the amount of state unemployment tax (SUTA) and federal unemployment tax (FUTA) 293

9-10 Calculating employer's fringe benefit expenses 294

9-11 Calculating quarterly estimated tax for self-employed persons 295

Chapter 10: Simple Interest and Promissory Notes 312

Section I: Understanding and Computing Simple Interest 313

10-1 Computing simple interest for loans with terms of years or months 313

10-2 Calculating simple interest for loans with terms of days by using the exact interest and ordinary interest methods 314

10-3 Calculating the maturity value of a loan 316

10-4 Calculating the number of days of a loan 317

10-5 Determining the maturity date of a loan 318

Section II: Using the Simple Interest Formula 321

10-6 Solving for the principal 322

10-7 Solving for the rate 323

10-8 Solving for the time 323

10-9 Calculating loans involving partial payments before maturity 325

Section III: Understanding Promissory Notes and Discounting 331

10-10 Calculating bank discount and proceeds for a simple discount note 332

10-11 Calculating true, or effective, rate of interest for a simple discount note 333

10-12 Discounting notes before maturity 333

10-13 Purchasing U.S. Treasury bills 335

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. WCN 02-200-202

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. Due to electronic rights, some third party content may be suppressed from the eBook and/or eChapter(s). Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. Cengage Learning reserves the right to remove additional content at any time if subsequent rights restrictions require it.

Chapter 11: Compound Interest and Present Value 350

Section I: Compound Interest—The Time Value of Money 351

11-1 Manually calculating compound amount (future value) and compound interest 352

11-2 Computing compound amount (future value) and compound interest by using compound interest tables 353

11-3 Creating compound interest table factors for periods beyond the table 356

11-4 Calculating annual percentage yield (APY) or effective interest rate 357

11-5 Calculating compound amount (future value) by using the compound interest formula 358

Section II: Present Value 363

11-6 Calculating the present value of a future amount by using present value tables 364

11-7 Creating present value table factors for periods beyond the table 366

11-8 Calculating present value of a future amount by using the present value formula 367

Chapter 12: Annuities 380

Section I: Future Value of an Annuity: Ordinary and Annuity Due 381

12-1 Calculating the future value of an ordinary annuity by using tables 381

12-2 Calculating the future value of an annuity due by using tables 385

12-3 Calculating the future value of an ordinary annuity and an annuity due by formula 386

Section II: Present Value of an Annuity: Ordinary and Annuity Due 391

12-4 Calculating the present value of an ordinary annuity by using tables 392

12-5 Calculating the present value of an annuity due by using tables 393

12-6 Calculating the present value of an ordinary annuity and an annuity due by formula 396

Section III: Sinking Funds and Amortization 400

12-7 Calculating the amount of a sinking fund payment by table 400

12-8 Calculating the amount of an amortization payment by table 401

12-9 Calculating sinking fund payments by formula 402

12-10 Calculating amortization payments by formula 403

Chapter 13: Consumer and Business Credit 420

Section I: Open-End Credit—Charge Accounts, Credit Cards, and Lines of Credit 421

13-1 Calculating the finance charge and new balance by using the unpaid or previous month's balance method 422

13-2 Calculating the finance charge and new balance by using the average daily balance method 426

13-3 Calculating the finance charge and new balance of business and personal lines of credit 428

Section II: Closed-End Credit—Installment Loans 435

13-4 Calculating the total deferred payment price and the amount of the finance charge of an installment loan 436

13-5 Calculating the regular monthly payments of an installment loan by the add-on interest method 437

13-6 Calculating the annual percentage rate of an installment loan by APR tables and by formula 438

13-7 Calculating the finance charge and monthly payment of an installment loan by using the APR tables 443

13-8 Calculating the finance charge rebate and the payoff for loans paid off early by using the sum-of-the-digits method 444

Chapter 14: Mortgages 467

Section I: Mortgages—Fixed-Rate and Adjustable-Rate 468

14-1 Calculating the monthly payment and total interest paid on a fixed-rate mortgage 469

14-2 Preparing a partial amortization schedule of a mortgage 471

14-3 Calculating the monthly PITI of a mortgage loan 473

14-4 Understanding closing costs and calculating the amount due at closing 474

14-5 Calculating the interest rate of an adjustable-rate mortgage (ARM) 477

Section II: Second Mortgages—Home Equity Loans and Lines of Credit 483

14-6 Calculating the potential amount of credit available to a borrower 483

14-7 Calculating the housing expense ratio and the total obligations ratio of a borrower 484

Chapter 15: Financial Statements and Ratios 499

Section I: The Balance Sheet 500

15-1 Preparing a balance sheet 501

15-2 Preparing a vertical analysis of a balance sheet 504

15-3 Preparing a horizontal analysis of a balance sheet 506

Section II: The Income Statement 513

15-4 Preparing an income statement 513

15-5 Preparing a vertical analysis of an income statement 516

15-6 Preparing a horizontal analysis of an income statement 518

Section III: Financial Ratios and Trend Analysis 523

15-7 Calculating financial ratios 524

15-8 Preparing a trend analysis of financial data 527

Chapter 16: Inventory 552

Section I: Inventory Valuation 553

16-1 Pricing inventory by using the first-in, first-out (FIFO) method 554

16-2 Pricing inventory by using the last-in, first-out (LIFO) method 556

16-3 Pricing inventory by using the average cost method 558

16-4 Pricing inventory by using the lower-of-cost-or-market (LCM) rule 559

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. WCN 02-200-202

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. Due to electronic rights, some third party content may be suppressed from the eBook and/or eChapter(s). Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. Cengage Learning reserves the right to remove additional content at any time if subsequent rights restrictions require it.

Section II: Inventory Estimation 565

16-5 Estimating the value of ending inventory by using the retail method 565

16-6 Estimating the value of ending inventory by using the gross profit method 567

Section III: Inventory Turnover and Targets 571

16-7 Calculating inventory turnover rate at retail 571

16-8 Calculating inventory turnover rate at cost 572

16-9 Calculating target inventories based on industry standards 573

Chapter 17: Depreciation 587

Section I: Traditional Depreciation—Methods Used for Financial Statement Reporting 588

17-1 Calculating depreciation by the straight-line method 588

17-2 Calculating depreciation by the sum-of-the-years' digits method 590

17-3 Calculating depreciation by the declining-balance method 592

17-4 Calculating depreciation by the units-of-production method 594

Section II: Asset Cost Recovery Systems—IRS-Prescribed Methods for Income Tax Reporting 600

17-5 Calculating depreciation by using the Modified Accelerated Cost Recovery System (MACRS) 600

17-6 Calculating the periodic depletion cost of natural resources 604

Chapter 18: Taxes 617

Section I: Sales and Excise Taxes 618

18-1 Determining sales tax by using sales tax tables 618

18-2 Calculating sales tax by using the percent method 620

18-3 Calculating selling price and amount of sales tax when total purchase price is known 621

18-4 Calculating excise tax 621

Section II: Property Tax 624

18-5 Calculating the amount of property tax 625

18-6 Calculating tax rate necessary in a community to meet budgetary demands 628

Section III: Income Tax 631

18-7 Calculating taxable income for individuals 631

18-8 Using the Tax Rate Tables to calculate tax liability 633

18-9 Calculating an individual's tax refund or amount of tax owed 635

18-10 Calculating corporate income tax and net income after taxes 636

Chapter 19: Insurance 650

Section I: Life Insurance 651

19-1 Understanding life insurance and calculating typical premiums for various types of policies 652

19-2 Calculating the value of various nonforfeiture options 655

19-3 Calculating the amount of life insurance needed to cover dependents' income shortfall 657

Section II: Property Insurance 661

19-4 Understanding property insurance and calculating typical fire insurance premiums 661

19-5 Calculating premiums for short-term policies and the refunds due on canceled policies 663

19-6 Understanding coinsurance and computing compensation due in the event of a loss 665

19-7 Determining each company's share of a loss when liability is divided among multiple carriers 666

Section III: Motor Vehicle Insurance 670

19-8 Understanding motor vehicle insurance and calculating typical premiums 670

19-9 Computing the compensation due following an accident 673

Chapter 20: Investments 685

Section I: Stocks 686

20-1 Understanding stocks and distributing dividends on preferred and common stock 686

20-2 Reading a stock quotation table 689

20-3 Calculating current yield of a stock 691

20-4 Determining the price-earnings ratio of a stock 692

20-5 Computing the cost, proceeds, and gain (or loss) on a stock transaction 693

Section II: Bonds 699

20-6 Understanding bonds and reading a bond quotation table 699

20-7 Calculating the cost of purchasing bonds and the proceeds from the sale of bonds 702

20-8 Calculating the current yield of a bond 704

Section III: Mutual Funds 707

20-9 Understanding mutual funds and reading a mutual fund quotation table 707

20-10 Calculating the sales charge and sales charge percent of a mutual fund 709

20-11 Calculating the net asset value of a mutual fund 710

20-12 Calculating the number of shares purchased of a mutual fund 710

20-13 Calculating return on investment 711

Chapter 21: Business Statistics and Data Presentation 726

Section I: Data Interpretation and Presentation 727

21-1 Reading and interpreting information from a table 727

21-2 Reading and constructing a line chart 729

21-3 Reading and constructing a bar chart 733

21-4 Reading and constructing a pie chart 739

Section II: Measures of Central Tendency and Dispersion—Ungrouped Data 747

21-5 Calculating the arithmetic mean of ungrouped data 748

21-6 Determining the median 748

21-7 Determining the mode 750

21-8 Determining the range 751

Section III: Frequency Distributions—Grouped Data 754

21-9 Constructing a frequency distribution 754

21-10 Calculating the mean of grouped data 755

21-11 Preparing a histogram of a frequency distribution 756

Appendix A: Answers to Odd-Numbered Exercises A-2

Index I-1

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. WCN 02-200-202

Copyright 2020 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. Due to electronic rights, some third party content may be suppressed from the eBook and/or eChapter(s). Editorial review has deemed that any suppressed content does not materially affect the overall learning experience. Cengage Learning reserves the right to remove additional content at any time if subsequent rights restrictions require it.