

Contents

Preface to the Instructor xi

Preface to the Student xv

CHAPTER 1

Integrated Review: Getting Ready for Organizing and Summarizing Data 1

Note: The material in this chapter should be covered in conjunction with Chapter 1 Data Collection and prior to Chapter 2 Organizing and Summarizing Data.

- 1.IR1** Fundamentals of Fractions 1
 - 1.IR1.1** Identify Terms Used with Fractions 1
 - 1.IR1.2** Find Equivalent Fractions 4
 - 1.IR1.3** Write a Fraction in Lowest Terms 5
- 1.IR2** Fundamentals of Decimals 9
 - 1.IR2.1** Understand the Place Value of a Decimal Number 9
 - 1.IR2.2** Read and Write Decimals in Words 10
 - 1.IR2.3** Write Decimals as Fractions 12
 - 1.IR2.4** Round Decimals to a Given Place Value 13
- 1.IR3** The Real Number Line 16
 - 1.IR3.1** Classify Numbers 16
 - 1.IR3.2** Plot Points on a Real Number Line 19
 - 1.IR3.3** Use Inequalities to Order Real Numbers 20
 - 1.IR3.4** Compute the Absolute Value of a Real Number 23
- 1.IR4** Multiplying and Dividing Fractions 24
 - 1.IR4.1** Multiply Fractions 24
 - 1.IR4.2** Divide Fractions 27
- 1.IR5** Adding and Subtracting Fractions 31
 - 1.IR5.1** Add or Subtract Fractions with Like Denominators 31
 - 1.IR5.2** Find the Least Common Denominator and Equivalent Fractions 34
 - 1.IR5.3** Add or Subtract Fractions with Unlike Denominators 36
- 1.IR6** Operations on Decimals 42
 - 1.IR6.1** Add or Subtract Decimals 42
 - 1.IR6.2** Multiply Decimals 46
 - 1.IR6.3** Divide a Decimal by a Whole Number 50
 - 1.IR6.4** Divide a Decimal by a Decimal 53
 - 1.IR6.5** Divide Decimals by Powers of 10 54
 - 1.IR6.6** Convert a Fraction to a Decimal 55
- 1.IR7** Fundamentals of Percent Notation 58
 - 1.IR7.1** Define Percent 58
 - 1.IR7.2** Convert Percents to Decimals and Decimals to Percents 59
 - 1.IR7.3** Convert Percents to Fractions and Fractions to Percents 61
- 1.IR8** Language Used in Modeling 65
 - 1.IR8.1** Use Models That Involve Addition and Subtraction 65
 - 1.IR8.2** Use Models That Involve Multiplication 66
 - 1.IR8.3** Use Models That Involve Division 67

v

CHAPTER 2**Integrated Review: Getting Ready for Numerically Summarizing Data 70**

Note: The material in this chapter should be covered in conjunction with Chapter 2 Organizing and Summarizing Data, and prior to Chapter 3 Numerically Summarizing Data.

- 2.IR1** Exponents and the Order of Operations 70
 - 2.IR1.1** Evaluate Exponential Expressions 70
 - 2.IR1.2** Apply the Rules for Order of Operations 72
- 2.IR2** Square Roots 78
 - 2.IR2.1** Evaluate Square Roots 78
 - 2.IR2.2** Determine Whether a Square Root Is Rational, Irrational, or Not a Real Number 80
- 2.IR3** Simplifying Algebraic Expressions; Summation Notation 83
 - 2.IR3.1** Evaluate Algebraic Expressions 83
 - 2.IR3.2** Identify Like Terms and Unlike Terms 84
 - 2.IR3.3** Use the Distributive Property 86
 - 2.IR3.4** Simplify Algebraic Expressions by Combining Like Terms 87
 - 2.IR3.5** Use Summation Notation 88
- 2.IR4** Solving Linear Equations 91
 - 2.IR4.1** Determine Whether a Number Is a Solution to an Equation 91
 - 2.IR4.2** Solve Linear Equations 93
 - 2.IR4.3** Determine Whether an Equation Is a Conditional Equation, an Identity, or a Contradiction 97
- 2.IR5** Using Linear Equations to Solve Problems 101
 - 2.IR5.1** Translate English Sentences into Mathematical Statements 101
 - 2.IR5.2** Model and Solve Direct Translation Problems 102
 - 2.IR5.3** Solve for a Variable in a Formula 106

CHAPTER 3**Integrated Review: Getting Ready for Least-Squares Regression 111**

Note: The material in this chapter should be covered in conjunction with Chapter 3 Numerically Summarizing Data, and prior to Chapter 4 Describing the Relation between Two Variables.

- 3.IR1** The Rectangular Coordinate System and Equations in Two Variables 111
 - 3.IR1.1** Plot Points in the Rectangular Coordinate System 111
 - 3.IR1.2** Determine Whether an Ordered Pair Satisfies an Equation 115
 - 3.IR1.3** Create a Table of Values That Satisfy an Equation 117
- 3.IR2** Graphing Equations in Two Variables 124
 - 3.IR2.1** Graph a Line by Plotting Points 124
 - 3.IR2.2** Graph a Line Using Intercepts 129
 - 3.IR2.3** Graph Vertical and Horizontal Lines 132
- 3.IR3** Slope 137
 - 3.IR3.1** Find the Slope of a Line Given Two Points 137
 - 3.IR3.2** Find the Slope of Vertical and Horizontal Lines 140

- 3.IR3.3 Graph a Line Using Its Slope and a Point on the Line 142
- 3.IR3.4 Work with Applications of Slope 143
- 3.IR4 Slope-Intercept Form of a Line 147
 - 3.IR4.1 Use the Slope-Intercept Form to Identify the Slope and y-Intercept of a Line 147
 - 3.IR4.2 Graph a Line Whose Equation Is in Slope-Intercept Form 148
 - 3.IR4.3 Graph a Line Whose Equation Is in the Form $Ax + By = C$ 150
 - 3.IR4.4 Find the Equation of a Line Given Its Slope and y-Intercept 150
 - 3.IR4.5 Work with Linear Models in Slope-Intercept Form 151
- 3.IR5 Point-Slope Form of a Line 156
 - 3.IR5.1 Find the Equation of a Line Given a Point and a Slope 156
 - 3.IR5.2 Find the Equation of a Line Given Two Points 158
 - 3.IR5.3 Build Linear Models from Data 160

CHAPTER 4 Integrated Review: Getting Ready for Probability 167

Note: The material in this chapter should be covered in conjunction with Chapter 4 Describing the Relation between Two Variables, and prior to Chapter 5 Probability.

- 4.IR1 Scientific Notation 167
 - 4.IR1.1 Convert Decimal Notation to Scientific Notation 167
 - 4.IR1.2 Convert Scientific Notation to Decimal Notation 168
 - 4.IR1.3 Use Scientific Notation to Multiply and Divide 169
- 4.IR2 Interval Notation; Intersection and Union of Sets 173
 - 4.IR2.1 Represent Inequalities Using the Real Number Line and Interval Notation 173
 - 4.IR2.2 Determine the Intersection or Union of Two Sets 176
- 4.IR3 Linear Inequalities 179
 - 4.IR3.1 Solve Linear Inequalities Using Properties of Inequalities 179
 - 4.IR3.2 Model Inequality Problems 185

Note: There is no integrated review material to be covered in conjunction with Chapter 5 Probability, and prior to Chapter 6 Discrete Probability Distributions.

CHAPTER 6 Integrated Review: Getting Ready for the Normal Probability Distribution 189

Note: The material in this chapter should be covered in conjunction with Chapter 6 Discrete Probability Distributions, and prior to Chapter 7 The Normal Probability Distribution.

- 6.IR1 Perimeter and Area of Polygons and Circles 189
 - 6.IR1.1 Find the Perimeter and Area of a Rectangle and a Square 190
 - 6.IR1.2 Find the Perimeter and Area of a Parallelogram and a Trapezoid 196
 - 6.IR1.3 Find the Perimeter and Area of a Triangle 198
 - 6.IR1.4 Find the Circumference and Area of a Circle 198

Note: There is no integrated review material to be covered in conjunction with Chapter 7 The Normal Probability Distribution, and prior to Chapter 8 Sampling Distributions.

CHAPTER 8 Integrated Review: Getting Ready for Confidence Intervals 205

Note: The material in this chapter should be covered in conjunction with Chapter 8 Sampling Distributions, and prior to Chapter 9 Estimating the Value of a Parameter.

- 8.IR1** Compound Inequalities 205
 - 8.IR1.1** Solve Compound Inequalities Involving “and” 205
 - 8.IR1.2** Solve Compound Inequalities Involving “or” 208
 - 8.IR1.3** Solve Problems Using Compound Inequalities 209
- 8.IR2** Absolute Value Equations and Inequalities 213
 - 8.IR2.1** Solve Absolute Value Equations 213
 - 8.IR2.2** Solve Absolute Value Inequalities Involving $<$ or \leq 216
 - 8.IR2.3** Solve Absolute Value Inequalities Involving $>$ or \geq 218
 - 8.IR2.4** Solve Applied Problems Involving Absolute Value Inequalities 220

APPENDIX A Functional, Exponential Functions, Logarithmic Functions 225

Note: The material in this chapter is optional and may be covered as part of an integrated review course.

- A.IR1** Relations 225
 - A.IR1.1** Understand Relations 225
 - A.IR1.2** Find the Domain and the Range of a Relation 226
 - A.IR1.3** Graph a Relation Defined by an Equation 229
- A.IR2** An Introduction to Functions 232
 - A.IR2.1** Determine Whether a Relation Expressed as a Map or Ordered Pairs Represents a Function 232
 - A.IR2.2** Determine Whether a Relation Expressed as an Equation Represents a Function 234
 - A.IR2.3** Determine Whether a Relation Expressed as a Graph Represents a Function 235
 - A.IR2.4** Find the Value of a Function 236
 - A.IR2.5** Find the Domain of a Function 238
 - A.IR2.6** Work with Applications of Functions 239
- A.IR3** Functions and Their Graphs 243
 - A.IR3.1** Graph a Function 243
 - A.IR3.2** Obtain Information from the Graph of a Function 244
 - A.IR3.3** Know Properties and Graphs of Basic Functions 248
 - A.IR3.4** Interpret Graphs of Functions 249
- A.IR4** Linear Functions and Models 253
 - A.IR4.1** Graph Linear Functions 253
 - A.IR4.2** Find the Zero of a Linear Function 254
 - A.IR4.3** Build Linear Models from Verbal Descriptions 256
- Getting Ready for Exponential and Logarithmic Functions 263**
 - 1** Simplify Exponential Expressions Using the Product Rule 263
 - 2** Simplify Exponential Expressions Using the Quotient Rule 264
 - 3** Evaluate Exponential Expressions with a Zero or Negative Exponent 264
 - 4** Simplify Exponential Expressions Using the Power Rule 267
 - 5** Simplify Exponential Expressions Containing Products or Quotients 268

- A.IR5** Exponential Functions 271
 - A.IR5.1** Evaluate Exponential Expressions 272
 - A.IR5.2** Graph Exponential Functions 273
 - A.IR5.3** Define the Number e 276
 - A.IR5.4** Solve Exponential Equations 277
 - A.IR5.5** Use Exponential Models That Describe Our World 278
- A.IR6** Logarithmic Functions 285
 - A.IR6.1** Change Exponential Equations to Logarithmic Equations 285
 - A.IR6.2** Change Logarithmic Equations to Exponential Equations 286
 - A.IR6.3** Evaluate Logarithmic Functions 286
 - A.IR6.4** Determine the Domain of a Logarithmic Function 288
 - A.IR6.5** Graph Logarithmic Functions 288
 - A.IR6.6** Work with Natural and Common Logarithms 291
 - A.IR6.7** Solve Logarithmic Equations 291
 - A.IR6.8** Use Logarithmic Models That Describe Our World 293
- A.IR7** Properties of Logarithms 296
 - A.IR7.1** Understand the Properties of Logarithms 296
 - A.IR7.2** Write a Logarithmic Expression as a Sum or Difference of Logarithms 297
 - A.IR7.3** Write a Logarithmic Expression as a Single Logarithm 300
 - A.IR7.4** Evaluate a Logarithm Whose Base Is Neither 10 Nor e 301
- A.IR8** Exponential Equations 304
 - A.IR8.1** Solve Exponential Equations 304
 - A.IR8.2** Solve Equations Involving Exponential Models 306

Answers to Selected Exercises AN-1