Table of Contents

Preface	xxix
To the Student	xxx
Section One Operating with Whole Numbers	2
CHAPTER 1: Whole Numbers and the Place Value System	4
Whole Numbers	4
Base Ten System	5
Basic Digits	5
Place Value	5
Expanded Form	5
Place Value Chart	7
Study Exercise One	7
Reading Numerals Representing Whole Numbers	8
Using Commas	8
More Examples	9
Study Exercise Two	9
Writing Numerals Representing Whole Numbers	9
Study Exercise Three	10
Rounding Whole Numbers	11
Study Exercise Four	12
REVIEW EXERCISES	12
Solutions to Review Exercises	13
SUPPLEMENTARY PROBLEMS	13
Solutions to Study Exercises	16
CHAPTER 2: Addition and Subtraction of Whole Numbers	18
Forms of Addition	18
Addition Facts	19
Interchanging Addends (the Commutative Property)	19
Addition Involving Three or More Addends (the Associative Property)	20
Study Exercise One	20
Review of Place Value Notation and Expanded Form	21
Study Exercise Two	21
Addition Using Place Value Notation	21
A Shorter Method	22
Checking Addition Problems	2.2

Study Exercise Three	23
Addition Involving Carrying with Regrouping	24
More Examples	24
Study Exercise Four	24
Using Addition to Solve Applied Problems	25
Study Exercise Five	25
Subtraction	25
Check for Subtraction	25
Study Exercise Six	26
Subtraction Using Place Value Notation	26
A Shorter Method	27
Study Exercise Seven	28
Subtraction Using Borrowing with Regrouping	28
More About Borrowing with Regrouping	29
More Examples	29
Study Exercise Eight	30
Uses of Subtraction	30
Some Examples	31
Study Exercise Nine	31
REVIEW EXERCISES	32
Solutions to Review Exercises	33
SUPPLEMENTARY PROBLEMS	34
Solutions to Study Exercises	38
CHAPTER 3 Multiplication of Whole Numbers	42
Multiplication	42
Multiplication Facts	43
Study Exercise One	43
Forms of Multiplication	44
Interchanging Factors (the Commutative Property)	
interenanging ractors (the Commutative Property)	44
Multiplication Involving Three or More Factors (the Associative Property)	44 44
Multiplication Involving Three or More Factors (the Associative Property)	44
Multiplication Involving Three or More Factors (the Associative Property) Study Exercise Two	44 45
Multiplication Involving Three or More Factors (the Associative Property) Study Exercise Two Multiplication by Zero	44 45 45
Multiplication Involving Three or More Factors (the Associative Property) Study Exercise Two Multiplication by Zero Multiplication by One	44 45 45 45
Multiplication Involving Three or More Factors (the Associative Property) Study Exercise Two Multiplication by Zero Multiplication by One Study Exercise Three	44 45 45 45 46
Multiplication Involving Three or More Factors (the Associative Property) Study Exercise Two Multiplication by Zero Multiplication by One Study Exercise Three Multiplication by Ten	44 45 45 45 46 46
Multiplication Involving Three or More Factors (the Associative Property) Study Exercise Two Multiplication by Zero Multiplication by One Study Exercise Three Multiplication by Ten Rule for Multiplying by Ten	44 45 45 45 46 46 46
Multiplication Involving Three or More Factors (the Associative Property) Study Exercise Two Multiplication by Zero Multiplication by One Study Exercise Three Multiplication by Ten Rule for Multiplying by Ten Multiplication by One Hundred	44 45 45 45 46 46 46
Multiplication Involving Three or More Factors (the Associative Property) Study Exercise Two Multiplication by Zero Multiplication by One Study Exercise Three Multiplication by Ten Rule for Multiplying by Ten Multiplication by One Hundred Rule for Multiplying by One Hundred	44 45 45 45 46 46 46 46 47
Multiplication Involving Three or More Factors (the Associative Property) Study Exercise Two Multiplication by Zero Multiplication by One Study Exercise Three Multiplication by Ten Rule for Multiplying by Ten Multiplication by One Hundred Rule for Multiplying by One Hundred Study Exercise Four	44 45 45 45 46 46 46 47 47

Multiplication Involving Place Values	48
Multiplication of 213 4 (Long Form)	49
Multiplication of 21 3 4 (Short Form)	49
Multiplication of 211 3 32 (Long Form)	49
Multiplication of 211 3 32 (Short Form)	50
Study Exercise Six	50
Working with Zeros in Multiplication	50
Study Exercise Seven	51
Multiplication in Short Form with Carrying	51
Checking Answers to Multiplication Problems	52
Study Exercise Eight	52
Written Problems Using Multiplication	53
Study Exercise Nine	53
REVIEW EXERCISES	53
Solutions to Review Exercises	54
SUPPLEMENTARY PROBLEMS	55
Solutions to Study Exercises	56
CHAPTER 4: Division of Whole Numbers	60
Three Symbols for Division	60
Parts of a Division Problem	60
The Division Check	61
Properties of Division	61
Study Exercise One	61
The Long Division Form	62
Checking Division Involving Remainders	62
Study Exercise Two	63
Long Division Where the Divisor Is a Single Digit	64
Study Exercise Three	65
Trial Divisor—Trial Dividend—Trial Quotient	65
Checking the Trial Quotient	66
Adjusting the Trial Quotient	66
Another Example	67
Study Exercise Four	67
Long Division Where the Divisor Contains Two or More Digits	68
Study Exercise Five	69
Working With Zeros in Division	69
Study Exercise Six	70
Two Uses of Division	71
Study Exercise Seven	71
REVIEW EXERCISES	72
Solutions to Review Exercises	72

SUPPLEMENTARY PROBLEMS	73
Solutions to Study Exercises	75
CHAPTER 5 Solving Verbal Problems by Reduction and Expansion	80
Reduction	80
Study Exercise One	81
Expansion	82
Study Exercise Two	82
Reduction and Expansion	83
Study Exercise Three	84
REVIEW EXERCISES	84
Solutions to Review Exercises	85
SUPPLEMENTARY PROBLEMS	85
Solutions to Study Exercises	86
<u></u>	
CHAPTER 6 Exponents, Perfect Squares, and Square Roots	88
Factors	88
A Simpler Notation	88
Exponential Notation	89
Reading Exponents	89
Study Exercise One	89
Changing to Exponential Notation	89
Study Exercise Two	90
Evaluating Exponential Expressions	90
Study Exercise Three	91
Perfect Squares	91
More Examples of Perfect Squares	91
Study Exercise Four	91
Square Roots of Perfect Squares	91
More Examples	92
Relationship of Squaring to Square Rooting	92
Symbol for Square Root	92
Study Exercise Five	92
Table of Perfect Squares and Square Roots	93
REVIEW EXERCISES	93
Solutions to Review Exercises	94
SUPPLEMENTARY PROBLEMS	
	94
Solutions to Study Exercises	95
CHAPTER 7 Primes, Composites, and Prime Factoring	96
Evenly Divisible	96
Even Numbers	97

Odd Numbers	97
Study Exercise One	98
Divisibility Tests	98
Divisibility Test for 2	98
Divisibility Test for 3	98
Study Exercise Two	99
Divisibility Test for 5	99
Divisibility Test for 10	99
Study Exercise Three	100
Natural Numbers	100
Prime Numbers	100
Composite Numbers	101
Natural Numbers Separated into Three Categories	101
Using the Divisibility Tests	101
Study Exercise Four	101
The Prime Numbers Less Than 30	102
Prime Factoring	102
The Prime Factorization of 30	102
The Prime Factorization of 90	102
The Prime Factorization of 200	102
The Prime Factorization of 1,911	102
Summary of Prime Factorization	103
Study Exercise Five	103
REVIEW EXERCISES	103
Solutions to Review Exercises	104
SUPPLEMENTARY PROBLEMS	104
Solutions to Study Exercises	105
CHAPTER 8 Least Common Multiple	108
Multiple	108
Study Exercise One	109
Common Multiples of 2 and 3	109
Common Multiples of 8 and 12	110
Study Exercise Two	110
The Least Common Multiple of 6 and 9	110
The Least Common Multiple (LCM) of 2, 4, and 6	111
Study Exercise Three	111
Using Exponents to Find the LCM	111
Study Exercise Four	113
Shortcuts For Finding the LCM	113
Study Exercise Five	115
REVIEW EXERCISES	115
Solutions to Review Exercises	116

SUPPLEMENTARY PROBLEMS	116
Solutions to Study Exercises	117
SECTION 1 PRACTICE TEST	119
ection 2 Operating with Fractions	122
CHAPTER 9 Introduction to Fractions	124
Part of a Whole	124
Fraction	125
Division of Zero	125
Study Exercise One	126
Terms of a Fraction	126
Equivalent Fractions	126
The Fundamental Principle of Fractions—Part 1	127
Fundamental Principle of Fractions—Part 2	127
Fundamental Principle of Fractions	128
Study Exercise Two	128
Equality of Fractions	128
Changing the Form of a Fraction	128
Study Exercise Three	129
Writing Whole Numbers as Fractions	130
Procedure	130
Study Exercise Four	131
REVIEW EXERCISES	131
Solutions to Review Exercises	132
SUPPLEMENTARY PROBLEMS	132
Solutions to Study Exercises	133
CHAPTER 10 Reducing Fractions	136
Review of the Fundamental Principle of Fractions	136
Expanding to Higher Terms	137
Reducing to Lower Terms	137
Study Exercise One	138
Reducing	138
Fractions with More Than One Common Factor	138
Reducing to Lowest Terms	138
Fractions Reduced to Lowest Terms	139
Study Exercise Two	139
A Shortcut for Reducing Fractions (Cancellation)	139
A Word about Cancellation	140
Examples of Reducing Fractions by Cancelling	140

Study Exercise Three	141
Mixed Numerals	141
Reading Mixed Numerals	141
Meaning of a Mixed Numeral	141
Improper Fractions	142
Study Exercise Four	142
Changing Improper Fractions to Mixed Numerals	142
Additional Examples	143
Study Exercise Five	143
REVIEW EXERCISES	144
Solutions to Review Exercises	144
SUPPLEMENTARY PROBLEMS	144
Solutions to Study Exercises	145
CHAPTER 11 Lowest Common Denominator and Comparison of Fractions	148
Like and Unlike Fractions	148
Common Denominators	148
Finding Common Denominators	149
Lowest Common Denominator (LCD)	149
Finding Like Fractions Using the Rule	149
Study Exercise One	150
LCD for Three or More Fractions	150
Method for Finding the LCD	150
Study Exercise Two	151
The LCD of Three or More Fractions	151
Study Exercise Three	152
Renaming Fractions	152
Expanding Fractions Using the LCD	152
Study Exercise Four	152
Comparing Fractions with the Same Denominator	153
StudyStudy Exercise Five	153
Comparing Fractions with Different Denominators	153
Comparing Unlike Fractions	154
StudyStudy Exercise Six	154
REVIEW EXERCISES	155
Solutions to Review Exercises	155
SUPPLEMENTARY PROBLEMS	156
Solutions to Study Exercises	156
CHAPTER 12 Addition and Subtraction of Fractions	160
Addition of Like Fractions	161
Two Formats of Addition	161

Study Exercise One	162
Adding Mixed Numerals	162
Study Exercise Two	163
Changing Mixed Numerals to Improper Fractions	163
Adding Mixed Numerals by Changing to Improper Fractions	164
Study Exercise Three	164
Addition of Unlike Fractions	164
Geometric Meaning	165
Study Exercise Four	166
Adding Mixed Numerals Containing Unlike Fractions	166
Horizontal Method	166
Study Exercise Five	167
Simple Subtraction of Fractions	167
Subtraction of Like Fractions	167
Subtraction of Unlike Fractions	168
Study Exercise Six	168
Subtraction of a Fraction from a Whole Number	168
Subtraction of Mixed Numerals with the Same Denominators	169
Study Exercise Seven	169
Subtraction of Mixed Numerals with Different Denominators	170
Study Exercise Eight	170
REVIEW EXERCISES	170
Solutions to Review Exercises	171
SUPPLEMENTARY PROBLEMS	172
Solutions to Study Exercises	172
CHAPTER 13 Multiplication of Fractions	176
Review Meaning of Multiplication	176
Multiplication of a Whole Number by a Fraction	177
Study Exercise One	177
Multiplication Using Cancellation	177
Halves and Fourths of 100	178
Thirds of 100	178
Study Exercise Two	178
Multiplying Two Fractions	179
Multiplying Two Fractions	179
Study Exercise Three	180
Multiplying Mixed Numerals	180
Study Exercise Four	181
Multiplication of Three Fractions	181
Study Exercise Five	182
Raising Fractions to Powers	182
Study Evercise Six	183

Square Roots	183
Square Roots of Perfect Squares	183
Square Roots of Fractions	184
Square Roots of Mixed Numerals	184
Study Exercise Seven	184
Changing from a Base of One	184
Study Exercise Eight	185
REVIEW EXERCISES	185
Solutions to Review Exercises	186
SUPPLEMENTARY PROBLEMS	186
Solutions to Study Exercises	188
CHAPTER 14 Division of Fractions	190
Reciprocal	190
Reciprocals of Whole Numbers and Mixed Numerals	191
Product of a Number by Its Reciprocal	191
Study Exercise One	192
Division of Fractions	192
Examples of Division of Fractions Using the Shortcut	192
Study Exercise Two	193
Mixed Numerals in Division Problems	193
Study Exercise Three	194
Complex Fractions	194
Numerators and Denominators of Complex Fractions	194
Additional Examples	195
Meaning of a Complex Fraction	195
Study Exercise Four	195
Simplifying a Complex Fraction	196
Study Exercise Five	196
Changing Back to a Base of One	196
Study Exercise Six	197
REVIEW EXERCISES	198
Solutions to Review Exercises	198
SUPPLEMENTARY PROBLEMS	199
Solutions to Study Exercises	200
CHAPTER 15 Equations and Applied Problems Involving Fractions	202
Applied Problems	202
Study Exercise One	204
Equation	205
Parts of an Equation	205

Changing Verbal Statements to Equations	205
Writing Equations	205
Solving an Equation	205
Study Exercise Two	206
Rule for Solving an Equation	206
Study Exercise Three	207
To Find What Part One Number Is of Another	207
Study Exercise Four	208
Finding a Number When a Fractional Part Is Known	209
Study Exercise Five	209
REVIEW EXERCISES	210
Solutions to Review Exercises	210
SUPPLEMENTARY PROBLEMS	211
Solutions to Study Exercises	212
CHAPTER 16 Ratio and Proportion	214
Ratio	214
Different Ways of Writing a Ratio	214
Steps In Writing a Ratio	215
Examples of Ratios	215
Ratios of Like and Unlike Measurements	216
Examples of Ratios	216
Study Exercise One	216
Proportion	217
Cross Products Test	217
Determining When Ratios Are Proportional	217
Study Exercise Two	217
Solving Proportions	218
Study Exercise Three	219
Using Proportions in Applied Problems	219
Additional Examples	219
Study Exercise Four	220
REVIEW EXERCISES	220
Solutions to Review Exercises	221
SUPPLEMENTARY PROBLEMS	221
Solutions to Study Exercises	223
SECTION 2 PRACTICE TEST	224
Section 3 Operating with Decimals	228
CHAPTER 17 Decimal Numerals and Rounding	230

Review of the Place Value System	230
Decimal Point	231
Study Exercise One	232
Meaning of a Decimal	232
Study Exercise Two	232
Reading Decimals	233
Decimal Point	233
Omission of the Decimal Point	233
Study Exercise Three	233
Writing Decimals	234
Study Exercise Four	234
Converting Decimals to Fractions	234
Shortcut for Converting Decimals to Fractions	235
Study Exercise Five	235
Placing Zeros in a Decimal	235
Study Exercise Six	236
Need for Rounding Decimals	236
Rules for Rounding Decimals	236
Rounding to a Specified Number of Decimal Places	237
Study Exercise Seven	238
REVIEW EXERCISES	238
Solutions to Review Exercises	239
SUPPLEMENTARY PROBLEMS	239
Solutions to Study Exercises	240
CHAPTER 18 Changing Decimals to Fractions and Comparing Decimals	242
Review of Changing Decimals to Fractions	242
Examples	243
Study Exercise One	243
Decimals Ending with a Fraction	243
The Fraction At the End of a Decimal	243
Rules:	244
Study Exercise Two	244
Changing a Decimal Ending in a Fraction to a Fraction	245
Study Exercise Three	245
Study Exercise Four	246
Comparing Decimals	246
Additional Examples	247
Study Exercise Five	247
REVIEW EXERCISES	247
Solutions to Review Exercises	248
SUPPLEMENTARY PROBLEMS	248

Solutions to Study Exercises	249
CHAPTER 19 Addition and Subtractionof Decimals	252
Decimals as Fractions	252
Addition of Decimals	253
Study Exercise One	253
A Shorter Method of Adding Decimals	254
Examples	254
Carrying	255
Addition Using Carrying	255
Carrying Mentally	256
Examples	256
Study Exercise Two	256
Subtraction of Decimals	256
Checking a Subtraction Problem	257
Additional Examples	257
Study Exercise Three	257
Borrowing	257
Borrowing From Any Column	258
Study Exercise Four	258
Using Decimals to Solve Applied Problems—Addition	259
Using Decimals to Solve Applied Problems—Subtraction	259
Study Exercise Five	259
REVIEW EXERCISES	260
Solutions to Review Exercises	260
SUPPLEMENTARY PROBLEMS	261
Solutions to Study Exercises	263
CHAPTER 20 Multiplication of Decimals	266
Multiplication by Changing to Fractions	266
Multiplication of Decimals—Shortcut	267
Additional Examples	267
Study Exercise One	268
Inserting Zeros to Place the Decimal Point	268
Study Exercise Two	268
Multiplication by a Power of Ten	268
Multiplying Decimal Numerals by Powers of Ten	269
Inserting Zeros	269
Study Exercise Three	269
Review of Exponents	270
Powers of Decimals	270
Study Exercise Four	270
Applied Problems—Changing from a Base of One	270

Additional Examples	271
Study Exercise Five	271
REVIEW EXERCISES	272
Solutions to Review Exercises	272
SUPPLEMENTARY PROBLEMS	272
Solutions to Study Exercises	275
CHAPTER 21 Division of Decimals	276
Writing a Division Problem	276
Division of Decimals by Whole Numbers	276
Examples	277
Study Exercise One	277
Division by a Decimal	277
Shortcut	278
Examples:	279
Study Exercise Two	279
Steps in the Division by a Decimal	279
Study Exercise Three	280
Another Example	281
Study Exercise Four	281
Changing a Fraction to a Decimal	281
Study Exercise Five	281
Repeating Decimals	282
Study Exercise Six	282
Rounding	283
Study Exercise Seven	284
Division by Powers of Ten	284
Short Method of Division by Powers of Ten	284
Study Exercise Eight	285
REVIEW EXERCISES	285
Solutions to Review Exercises	285
SUPPLEMENTARY PROBLEMS	286
Solutions to Study Exercises	287
CHAPTER 22 Applied Problems and Equations Involving Decimals	292
Changing to a Base of One	292
Study Exercise One	293
Solving an Equation	293
Solving Equations Involving a Product	294
Examples	295
Study Exercise Two	295
Finding What Decimal Part One Number Is of Another	296

Study Exercise Three	29/
Finding a Number When a Decimal Part Is Known	297
Study Exercise Four	298
Changing Verbal Statements to Equations	298
Steps in Forming and Solving Equations	298
Study Exercise Five	299
REVIEW EXERCISES	299
Solutions to Review Exercises	300
SUPPLEMENTARY PROBLEMS	301
Solutions to Study Exercises	302
Section 3 Practice Test	305
Answers to Section 3 Practice Test	305
ction 4 Introduction to Percent	308
CHAPTER 23 Changing Percents to Fractions and Decimals	310
Percent	310
Changing Percents to Fractions	311
Study Exercise One	311
Percents Which Contain Fractions	312
Examples of Percents Which Contain Fractions	312
Study Exercise Two	313
Changing Percents to Decimals	313
A Short Cut	314
tudy Exercise Three	314
Finding a Percent of a Number	315
Study Exercise Four	315
REVIEW EXERCISES	315
Solutions to Review Exercises	316
SUPPLEMENTARY PROBLEMS	317
Solutions to Study Exercises	317
CHAPTER 24 Changing Decimals and Fractions to Percents	320
Changing Decimals to Percents	320
Study Exercise One	321
Changing Fractions with Denominators of 100 to Percents	321
Study Exercise Two	321
Fractions Not Having a Denominator of 100	321
Study Exercise Three	322
Examples	323
Study Exercise Four	324

Useful Equivalents	324
Study Exercise Five	325
Expressing a Percent as an Approximate Decimal by Rounding	325
Rounding Percents	326
Study Exercise Six	326
REVIEW EXERCISES	327
Solutions to Review Exercises	327
SUPPLEMENTARY PROBLEMS	329
Solutions to Study Exercises	330
CHAPTER 25 Three Types of Percent Problems	334
Finding a Percent of a Number	334
Examples	335
Study Exercise One	335
Using Percents Changed to Fractions	335
Study Exercise Two	336
Finding a Percent of an Amount of Money	336
Study Exercise Three	337
Applied Problems	337
Study Exercise Four	337
Review of Rule for Finding a Factor	338
Study Exercise Five	338
Finding the Number When a Percent of It Is Known	338
Study Exercise Six	340
Applied Problems	340
Study Exercise Seven	341
Finding What Percent One Number is of Another	341
Study Exercise Eight	343
Applied Problems	343
Study Exercise Nine	344
REVIEW EXERCISES	344
Solutions to Review Exercises	345
SUPPLEMENTARY PROBLEMS	346
Solutions to Study Exercises	347
CHAPTER 26 Interest—Simple and Compound	352
Part I—Simple Interest	352
Key Terms	352
Principal + Interest = Amount	353
Key Relationships	353
Study Exercise One	354
Simple Interest Formula	354

	Using the Formula to Find Simple Interest	354
	Study Exercise Two	356
	A Formula for Finding the Annual Interest Rate	357
	Using the Formula to Find the Annual Interest Rate	357
	Study Exercise Three	358
	Computing Interest on Charge Accounts Using the Monthly Interest Rate	359
	A Formula for Finding Interest for One Month	359
	Study Exercise Four	360
	Truth-in-Lending Act	360
	Summary, Part I—Simple Interest	360
	This Completes Part I—Simple Interest	361
	Part II—Compound Interest	361
	Analysis of Choice 1	361
	Analysis of Choice 2	362
	Compound Interest	362
	Procedure for Calculating Compound Interest for 1 Year	363
	Compound Amount	363
	Key Relationship	363
	Study Exercise Five	365
	A Short Cut	365
	Using a Compound Interest Table	365
	Summary, Part II—Compound Interest	365
	Study Exercise Six	366
	This Completes Part II—Compound Interest	366
	REVIEW EXERCISES	367
	Solutions to Review Exercises	368
	SUPPLEMENTARY PROBLEMS	370
	Part II—Compound Interest	371
	Solutions to Study Exercises	372
	SECTION 4 PRACTICE TEST	375
Se	ection 5 Optional Units Involving Applications of Percent	378
	CHAPTER 27 Percent Decrease	380
	Original Amount—New Amount—Amount of Decrease	380
	Key Relationships	381
	Study Exercise One	381
	Determining the Rate of Decrease	382
	Remember	383
	Study Exercise Two	383
	Using the Rate of Decrease to Find the Amount of Decrease	383
	Using the Rate of Decrease to Find the Original Amount	384

Formula for Finding the Original Amount or the Amount of Decrease	384
Study Exercise Three	385
Using the Rate of Decrease to Find the New Amount	385
A Short Cut	386
Using 100% Minus the Rate of Decrease to Find the Original Amount	386
Formula for Finding the Original Amount or the New Amount	387
Study Exercise Four	387
Summary	388
REVIEW EXERCISES	388
Solutions to Review Exercises	389
SUPPLEMENTARY PROBLEMS	390
Solutions to Study Exercises	391
CHAPTER 28 Commission	394
Sales Amount—Net Proceeds—Amount of Commission	394
Key Relationships	395
Study Exercise One	395
Determining the Rate of Commission	396
Remember	397
Study Exercise Two	397
Using the Rate of Commission to Find the Amount of Commission	397
Using the Rate of Commission to Find the Sales Amount	398
Formula for Finding the Sales Amount or Amount of Commission	398
Study Exercise Three	399
Using the Rate of Commission to Find the Net Proceeds	399
A Short Cut	399
Using 100% Minus the Rate of Commission to Find the Sales Amount	400
Formula for Finding the Sales Amount or Net Proceeds	401
Study Exercise Four	401 401
Summary	
REVIEW EXERCISES Solutions to Review Exercises	402 402
SUPPLEMENTARY PROBLEMS	403
Solutions to Study Exercises	405
CHAPTER 29 Discount	408
List Price—Net Price—Amount of Discount	408
Key Relationships	409
Study Exercise One	409
Determining the Rate of Discount	410
Remember	411

Study Exercise Two	411
Using the Rate of Discount to Find the Amount of Discount	411
Using the Rate of Discount to Find the List Price	412
Formula for Finding the List Price or the Amount of Discount	412
Study Exercise Three	413
Using the Rate of Discount to Find the Net Price	413
A Short Cut	414
Using 100% Minus the Rate of Discount to Find the List Price	414
Formula for Finding the List Price or the Net Price	415
Study Exercise Four	416
Summary	416
REVIEW EXERCISES	417
Solutions to Review Exercises	418
SUPPLEMENTARY PROBLEMS	420
Solutions to Study Exercises	421
CHAPTER 30 Percent Increase	426
New Amount—Original Amount—Amount of Increase	426
Key Relationships	427
Study Exercise One	427
Determining the Rate of Increase	428
Remember	429
Study Exercise Two	429
Using the Rate of Increase to Find the Amount of Increase	429
Using the Rate of Increase to Find the Original Amount	430
Formula for Finding the Original Amount or the Amount of Increase	430
Study Exercise Three	431
Using the Rate of Increase to Find the New Amount	431
A Short Cut	431
Using 100% Plus the Rate of Increase to Find the Original Amount	432
Formula for Finding Original Amount or New Amount	432
Study Exercise Four	433
Summary	433
REVIEW EXERCISES	434
Solutions to Review Exercises	434
SUPPLEMENTARY PROBLEMS	436
Solutions to Study Exercises	438
CHAPTER 31 Profit Based on Cost	442
Selling Price—Cost Price—Profit	442
Key Relationships	443
Study Exercise One	443

	Determining the Rate of Profit Based on Cost	444
	Remember	445
	Study Exercise Two	445
	Using the Rate of Profit to Find the Amount of Profit	445
	Using the Rate of Profit to Find the Cost Price	445
	Formula for Finding Cost Price or Profit	446
	Study Exercise Three	446
	Using the Rate of Profit to Find the Selling Price	447
	A Short Cut	447
	Using 100% plus the Rate of Profit to Find the Cost Price	448
	Formula for Finding the Cost Price or the Selling Price	448
	Study Exercise Four	448
	Summary	449
	REVIEW EXERCISES	449
	Solutions to Review Exercises	450
	SUPPLEMENTARY PROBLEMS	451
	Solutions to Study Exercises	453
	SECTION 5 PRACTICE TEST	455
		450
S	ection 6 Measurement	458
S	CHAPTER 32 Denominate Numerals and the English System of Measurement	458 460
S	CHAPTER 32 Denominate Numerals and the English System of Measurement	460
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals	460
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral	460 460
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals	460 460 461
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement	460 460 461 461
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement	460 460 461
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure	460 460 461 461 461
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement	460 460 461 461 461 462
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary	460 460 461 461 461 462 462
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions	460 460 461 461 461 462 462 463
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary Converting to Smaller Units of Measure	460 460 461 461 461 462 462 463
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary Converting to Smaller Units of Measure More Examples	460 460 461 461 461 462 462 463 463
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary Converting to Smaller Units of Measure More Examples Study Exercise One	460 460 461 461 461 462 463 463 463 465
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary Converting to Smaller Units of Measure More Examples Study Exercise One Converting to Larger Units of Measure	460 460 461 461 461 462 462 463 463 463 465
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary Converting to Smaller Units of Measure More Examples Study Exercise One Converting to Larger Units of Measure More Examples	460 460 461 461 461 462 463 463 463 465 465
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary Converting to Smaller Units of Measure More Examples Study Exercise One Converting to Larger Units of Measure More Examples Study Exercise Two	460 460 461 461 461 462 462 463 463 465 465 465
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary Converting to Smaller Units of Measure More Examples Study Exercise One Converting to Larger Units of Measure More Examples Study Exercise Two Simplified Form of Measurements	460 460 461 461 461 462 463 463 463 465 465 466
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary Converting to Smaller Units of Measure More Examples Study Exercise One Converting to Larger Units of Measure More Examples Study Exercise Two Simplified Form of Measurements Another Example	460 460 461 461 461 462 462 463 463 465 465 466 466
S	CHAPTER 32 Denominate Numerals and the English System of Measurement Denominate Numerals Measure of a Denominate Numeral Equivalent Denominate Numerals Units of Measurement The English System of Measurement Using a Table of Measure Conversions Summary Converting to Smaller Units of Measure More Examples Study Exercise One Converting to Larger Units of Measure More Examples Study Exercise Two Simplified Form of Measurements Another Example Study Exercise Three	460 460 461 461 461 462 463 463 463 465 465 466 466 466

Subtraction of Denominate Numerals	469
An Example Using Borrowing	469
Another Example Using Borrowing	469
Study Exercise Five	470
Multiplication Involving a Denominate Numeral	470
An Example Requiring Simplification Steps	470
Study Exercise Six	471
Division Involving Denominate Numerals	471
An Example Requiring a Simplification Step	471
Another Example Using Simplification	472
Study Exercise Seven	472
REVIEW EXERCISES	472
Solutions to Review Exercises	474
SUPPLEMENTARY PROBLEMS	476
Solutions to Study Exercises	478
CHAPTER 33 The Metric System of Measurement	482
A Unit in the Metric System for Length	482
A Unit in the Metric System for Volume	483
A Unit in the Metric System for Weight (Mass)	483
Some Prefixes Used in the Metric System	484
Examples Using the Prefixes	484
Remember	484
Study Exercise One	485
Length in the Metric System	485
Most Commonly Used Units of Length	485
Examples Involving Kilometers	486
Examples Involving Meters	486
Examples Involving Centimeters	486
Study Exercise Two	487
Volume in the Metric System	487
Volume Relationships	488
Relating Cubic Centimeters to Liters	488
Most Commonly Used Units of Volume	488
Examples Involving Liters	488
Examples Involving Milliliters and Cubic Centimeters	489
Study Exercise Three	489
Mass and Weight in the Metric System	489
Most Commonly Used Units of Mass and Weight	490
Examples Involving Kilograms	490
Examples Involving Grams	491
Study Exercise Four	491
REVIEW EXERCISES	491

Solutions to Review Exercises	493
SUPPLEMENTARY PROBLEMS	494
Solutions to Study Exercises	496
CHAPTER 34 Conversions Within the Metric System	498
Summary of the Metric System	498
Study Exercise One	499
The Chart—Left to Right	499
Study Exercise Two	500
Using the Chart for Fast Conversions—Right to left	500
Using the Chart for Fast Conversions—Left to Right	501
Basic Conversions—"Meter Family"	501
More Examples	502
Study Exercise Three	502
Basic Conversions—"Liter Family"	502
More Examples	503
Examples Using Cubic Centimeters	503
Study Exercise Four	504
Basic Conversions—"Gram Family"	504
More Examples	505
Examples Using Metric Tons	505
Study Exercise Five	506
The Prefix Mega	506
The Prefix Micro	506
More Examples	507
Study Exercise Six	508
Summary—Metric Prefixes We Have Studied	508
Summary—A Convenient Chart	509
REVIEW EXERCISES	509
Solutions to Review Exercises	510
SUPPLEMENTARY PROBLEMS	511
Solutions to Study Exercises	512
CHAPTER 35 Metric-English Conversions	514
Metric-English Conversion Tables	514
Converting from Metric to English	515
More Examples	515
Study Exercise One	516
Converting from English to Metric	517
More Examples	517
Study Exercise Two Temperature	518 518
Lemperature	118

Comparison of Fahrenheit and Celsius Scales	519
Conversion Between Fahrenheit and Celsius	519
Study Exercise Three	520
REVIEW EXERCISES	520
Solutions to Review Exercises	522
SUPPLEMENTARY PROBLEMS	523
Solutions to Study Exercises	525
	323
CHAPTER 36 Basic Geometry	526
Basic Geometric Terms	526
Angles	527
Measuring Angles	527
Types of Angles	528
Study Exercise One	528
Polygons	529
Examples of Figures that are NOT Polygons	529
Types of Polygons	530
Study Exercise Two	531
Triangles	531
Types of Triangles	532
Sum of the Interior Angles	533
Study Exercise Three	533
The Pythagorean Theorem	534
An Example of the Pythagorean Theorem	535
An Example Using Metric Measurement	535
An Example Requiring a Table	535
Study Exercise Four	536
Quadrilaterals	537
Special Quadrilaterals	537
Study Exercise Five	538
REVIEW EXERCISES	538
Solutions to Review Exercises	541
SUPPLEMENTARY PROBLEMS	542
Solutions to Study Exercises	545
CHAPTER 37 Area, Perimeter, and Circumference	548
Area	548
Area of a Rectangle	549
Perimeter	550
Perimeter of a Rectangle	550
Study Exercise One	551
Area of a Square	551

Perimeter of a Square	552
Study Exercise Two	553
Area of a Parallelogram	553
Using the Formula $A = \frac{1}{2}bh$	554
Perimeter of a Parallelogram	555
Study Exercise Three	555
Area of a Triangle	556
Using the Formula $A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$	557
Perimeter of a Triangle	558
Examples	558
Study Exercise Four	559
Area of a Trapezoid	560
Examples Involving the Area of a Trapezoid	560
Perimeter of a Trapezoid	561
Study Exercise Five	562
Circles	562
Area of a Circle	563
Circumference of a Circle	563
Study Exercise Six	564
Summary of Area, Perimeter, and Circumference	565
REVIEW EXERCISES	565
Solutions to Review Exercises	567
SUPPLEMENTARY PROBLEMS	569
Solutions to Study Exercises	573
CHAPTER 38 Volume and Surface Area	576
Three-Dimensional Solids	576
Prisms	576
Right Circular Cylinders	577
Spheres	578
Study Exercise One	578
Volume	579
Volume of a Prism	579
Examples Using the Formula $V = AH$	580
A Prism with Right Triangular Bases	580
An Applied Problem	581
Special Volume Formulas	582
Study Exercise Two	583
Volume of a Right Circular Cylinder	584
Examples Using the Formula $V = \pi r^2 h$	584
An Applied Problem	585
Study Exercise Three	585
Volume of a Sphere	586

Using the Formula $V = \frac{4\pi r^3}{3}$	586
An Applied Problem	586
Study Exercise Four	587
Surface Area	588
Surface Area of a Prism	588
Rectangular Solids	588
Cubes	589
Other Prisms	590
Study Exercise Five	591
Lateral Area of Right Circular Cylinders	591
Total Area of a Right Circular Cylinder	592
Study Exercise Six	593
Surface Area of a Sphere	593
Study Exercise Seven	594
Summary of Volume and Surface Area	594
REVIEW EXERCISES	595
Solutions to Review Exercises	597
SUPPLEMENTARY PROBLEMS	599
Solutions to Study Exercises	601
Section 6 Practice Test	604
opendix I	
TABLES	606
Table I—Powers and Roots	607
Table II—Compound Interest Table Showing How Much \$1	
Will Amount to at Various Rates	608
Table III—Tables of Measure	609
Metric-English Equivalents	611
Table IV—Metric Prefixes	611
opendix II	
ANSWERS TO ODD-NUMBERED SUPPLEMENTARY PROBLEMS	612
Chapter 1	613
Chapter 2	613
Chapter 3	613
Chapter 4	614
Chapter 5	614
Chapter 6	614

INDEX	628
PHOTO CREDITS	626
Chapter 38	624
Chapter 37	624
Chapter 36	624
Chapter 35	623
Chapter 34	623
Chapter 33	622
Chapter 32	622
Chapter 31	622
Chapter 30	622
Chapter 29	621
Chapter 28	621
Chapter 27	621
Chapter 26	621
Chapter 25	620
Chapter 24	620
Chapter 23	620
Chapter 22	619
Chapter 21	619
Chapter 20	619
Chapter 19	619
Chapter 18	618
Chapter 17	618
Chapter 16	618
Chapter 15	617
Chapter 14	617
Chapter 13	617
Chapter 12	616
Chapter 11	616
Chapter 10	616
Chapter 9	615
Chapter 8	615
Chapter 7	615