

CONTENTS

Preface

xix

REVIEW CHAPTER

FRACTIONS, DECIMALS, PERCENTS, AND THE METRIC SYSTEM 1

R.1	Fractions	2
R.1	Pre-Algebra Worksheet 1	10
R.1	Pre-Algebra Worksheet 2	11
R.1	Pre-Algebra Worksheet 3	12
R.1	Pre-Algebra Worksheet 4	13
	Worksheet 1 Fractions	14
	Worksheet 2 Fractions	15
	Worksheet 3 Fractions	16
R.1	Exercise Set	17
R.2	Decimals and Percents	20
R.2	Pre-Algebra Decimals and Percents Worksheet	26
	Worksheet 1 Multiplying and Dividing Decimals	28
	Worksheet 2 Adding and Subtracting Decimals and Percents	29
R.2	Exercise Set	30
R.3	The Metric System	36
R.3	Exercise Set	43

CHAPTER 1

REAL NUMBERS AND AN INTRODUCTION TO ALGEBRA 45

1.1	Symbols and Sets of Numbers	46
1.1	Exercise Set	48
1.2	Addition and Subtraction of Signed Numbers	49
1.2	Signed Numbers Worksheet 1	55
1.2	Signed Numbers Worksheet 2	56
1.2	Exercise Set	57
1.3	Multiplication and Division of Signed Numbers	60
1.3	Exercise Set	63

vi CONTENTS

1.4	Order of Operations, Exponents, and Roots	64
1.4	Exercise Set	67
1.5	Evaluating Algebraic Expressions	68
1.5	Exercise Set	74
	Review Problems for Chapters R and 1	77

CHAPTER 2

LINEAR EQUATIONS AND INEQUALITIES **83**

2.1	Simplifying Algebraic Expressions	84
2.1	Exercise Set	87
2.2	Solving Linear Equations Part I	88
2.2	Exercise Set	92
2.3	Solving Linear Equations Part II	94
2.3	Exercise Set	101
2.4	Introduction to Problem Solving	103
2.4	Exercise Set	110
2.5	Literal Equations	113
2.5	Exercise Set	119
2.6	Percents, Ratios, and Proportions	122
2.6	Exercise Set	127
2.7	Linear Inequalities	131
2.7	Exercise Set	135
	Review Problems for Chapter 2	136

CHAPTER 3

**GRAPHING EQUATIONS AND INEQUALITIES,
AND FINDING EQUATIONS OF LINES** **139**

3.1	Reading and Understanding Graphs	140
3.1	Exercise Set	148

3.2	Graphing Linear Equations and Functions by Plotting Points	151
3.2	Exercise Set	164
3.3	The x - and y -Intercept Method of Graphing Linear Equations	166
3.3	Exercise Set	173
3.4	The Slope of a Line and Direct Variation	175
3.4	Exercise Set	185
3.5	Deriving Equations of Lines—Linear Models	194
3.5	Exercise Set	206
3.6	Parallel and Perpendicular Lines	210
3.6	Exercise Set	213
3.7	Linear Inequalities in Two Variables	215
3.7	Exercise Set	223
	Review Problems for Chapter 3	225
	More Review Problems for Chapter 3	228

CHAPTER 4

EXPONENTS AND POLYNOMIALS

231

4.1	Positive Integer Exponents	232
4.1	Exercise Set	238
4.2	Negative Integer Exponents and Scientific Notation	240
4.2	Exercise Set	246
4.3	Introduction to Polynomials	249
4.3	Exercise Set	251
4.4	Adding and Subtracting Polynomials	252
4.4	Exercise Set	256
4.5	Multiplying Polynomials	259
4.5	Exercise Set	263
4.6	Dividing Polynomials	265
4.6	Exercise Set	274
	Review Problems for Chapter 4	275

CHAPTER 5**FACTORING POLYNOMIALS****279**

5.1	Factoring the Common Factor	280
5.1	Exercise Set	284
5.2	Factoring Trinomials $x^2 + bx + c$	285
5.2	Exercise Set	289
5.3	Factoring Trinomials $ax^2 + bx + c$	291
5.3	Exercise Set	298
5.4	Factoring Binomials	299
5.4	Exercise Set	301
5.5	Factoring Perfect Square Trinomials and a General Strategy for Factoring	302
5.5	Exercise Set	305
5.6	Solving Equations by Factoring	306
5.6	Exercise Set	308
5.7	Applications of Quadratic Equations	309
5.7	Exercise Set	312
	Review Problems for Chapter 5	314

CHAPTER 6**RATIONAL EXPRESSIONS AND EQUATIONS****317**

6.1	Simplifying Rational Expressions	318
6.1	Exercise Set	324
6.2	Multiplication and Division of Rational Expressions	326
6.2	Exercise Set	330
6.3	Solving Rational Equations and Inverse Variation	331
6.3	Exercise Set	337
6.4	Applications of Rational Equations	339
6.4	Exercise Set	347
6.5	Adding and Subtracting Rational Expressions, Part 1	350
6.5	Exercise Set	353

6.6	Adding and Subtracting Rational Expressions, Part 2	354
6.6	Exercise Set	356
6.7	Complex Rational Expressions	357
6.7	Exercise Set	359
6.8	Graphs of Rational Functions	360
6.8	Exercise Set	365
	Review Problems for Chapter 6	367

CHAPTER 7

SYSTEMS OF LINEAR EQUATIONS AND INEQUALITIES **369**

7.1	Solving Mixture and Investment Problems Using Substitution	370
7.1	Exercise Set	377
7.2	Systems of Equations and Their Graphs	379
7.2	Exercise Set	385
7.3	Finding Equations of Lines and Solving Distance Problems Using Elimination	386
7.3	Exercise Set	392
7.4	Systems of Linear Inequalities	394
7.4	Exercise Set	402
7.5	Systems of Three Equations	404
7.5	Exercise Set	411
	Review Problems for Chapter 7	412

CHAPTER 8

RADICALS, ROOTS, RATIONAL EXPONENTS, AND COMPLEX NUMBERS **415**

8.1	Roots and Radicals	417
8.1	Exercise Set	419
8.2	Rational Exponents: Meaning and Simplification	421
8.2	Exercise Set	425
8.3	Simplifying Radicals	426
8.3	Exercise Set	435

x CONTENTS

8.4	Addition, Subtraction, and Multiplication of Radical Expressions	437
8.4	Exercise Set	440
8.5	Rationalizing Denominators	441
8.5	Exercise Set	446
8.6	Solving Equations Containing Radicals	447
8.6	Exercise Set	451
8.7	Complex Numbers	452
8.7	Exercise Set	457
8.8	Graphs of Functions with Radicals, Translation of Axes	458
8.8	Exercise Set	471
	Review Problems for Chapter 8	475

CHAPTER 9

QUADRATIC EQUATIONS AND FUNCTIONS

479

9.1	Solving Quadratic Equations by Factoring	480
9.1	Exercise Set	484
9.2	Solving Quadratic Equations by the Square Root Property	486
9.2	Exercise Set	490
9.3	Completing the Square and the Quadratic Formula	492
9.3	Exercise Set	495
9.4	Solving Applied Problems Using the Quadratic Formula	496
9.4	Exercise Set	502
9.5	Applications of Quadratic Functions: $f(x) = a(x + h)^2 + k$	504
9.5	Exercise Set	508
9.6	Applications of Quadratic Functions: $f(x) = ax^2 + bx + c$	510
9.6	Exercise Set	517
	Review Problems for Chapter 9	520

CHAPTER 10**EXPONENTIAL AND LOGARITHMIC FUNCTIONS****523**

10.1	Exponential Functions	525
10.1	Exercise Set	533
10.2	Logarithms	536
10.2	Exercise Set	538
10.3	The Logarithm Function, Properties of Logarithms	539
10.3	Exercise Set	542
10.4	Commonly Used Bases for Logarithms, Change of Base	543
10.4	Exercise Set	549
10.5	Solving Equations Involving Exponentials and Logarithms	551
10.5	Exercise Set	553
10.6	Applications of Exponential Models with Logarithms	554
10.6	Exercise Set	558
	Review Problems for Chapter 10	560

APPENDICES

Appendix A1	—More on the Metric System	565
A1	Exercise Set	570
Appendix A2	—Ratio and Proportion Problems for Nursing Students	571
A2	Exercise Set	572
Appendix A3	—Dimensional Analysis	575
A3	Exercise Set	576
Appendix A4	—Absolute Value Equations and Inequalities	581
A4	Exercise Set	583
Appendix A5	—Piecewise Defined Functions and Definition of Function	584
A5	Exercise Set	586
Appendix A6	—Practice Accuplacer Placement Tests	587

SOLUTIONS

**SOLUTIONS TO ODD PROBLEMS FROM EXERCISE SETS AND
“YOU TRY THESE” PROBLEMS 609**

Review Chapter	609
Chapter 1	614
Chapter 2	619
Chapter 3	624
Chapter 4	635
Chapter 5	641
Chapter 6	646
Chapter 7	651
Chapter 8	654
Chapter 9	664
Chapter 10	667
Appendices	672
Algebra and Geometry Formulas	679

PHOTO CREDITS 685

INDEX 687