

Contents

Green means the topic was covered in Pre-Algebra (PC Math 3002/3003 or Math 100).

Blue means the topic was covered in Algebra 1 (Math 98 or Math 110).

Red means the topic is covered in Algebra 2, Math 99.

Orange means the section has parts from all three courses.

Black means that the topic will not be covered.

Chapter 1 - Real Numbers and Their Basic Properties	1
1.1 Real Numbers and Their Graphs	2
1.2 Fractions	12
1.3 Exponents and Order of Operations	27
1.4 Adding and Subtracting Real Numbers	38
1.5 Multiplying and Dividing Real Numbers	47
1.6 Algebraic Expressions	55
1.7 Properties of Real Numbers	63
Chapter 2 - Equations and Inequalities	78
2.1 Solving Basic Equations	79
2.2 Solving More Equations	92
2.3 Simplifying Expressions to Solve Equations	100
2.4 Introduction to Problem Solving	106
2.5 Motion and Mixture Problems	115
2.6 Formulas	124
2.7 Solving Inequalities	131
Chapter 3 - Graphing and Solving Systems of Equations and Inequalities	147
3.1 The Rectangular Coordinate System	148
3.2 Graphing Linear Equations	160
3.3 Solving Systems of Equations by Graphing	174
3.4 Solving Systems of Equations by Substitution	185
3.5 Solving Systems of Equations by Addition	191
3.6 Applications of Systems of Equation	199
3.7 Systems of Linear Inequalities	210

Chapter 4 - Polynomials		230
4.1	Natural-Number Exponents	231
4.2	Zero and Negative-Integer Exponents	239
4.3	Scientific Notation	244
4.4	Polynomials	250
4.5	Adding and Subtracting Polynomials	260
4.6	Multiplying Polynomials	267
4.7	Dividing Polynomials by Monomials	276
4.8	Dividing Polynomials by Polynomials	282
Chapter 5 - Factoring Polynomials		296
5.1	Factoring Out the Greatest Common Factor; Factoring by Grouping	297
5.2	Factoring the Difference of Two Squares	306
5.3	Factoring Trinomials with Lead Coefficients of 1	310
5.4	Factoring General Trinomials	320
5.5	Factoring the Sum and Difference of Two Cubes	328
5.6	Summary of Factoring Techniques	332
5.7	Solving Equations by Factoring	336
5.8	Problem Solving	342
Chapter 6 - Proportion and Rational Expressions		354
6.1	Ratios	355
6.2	Proportions and Similar Triangles	361
6.3	Simplifying Rational Expressions	372
6.4	Multiplying and Dividing Rational Expressions	380
6.5	Adding and Subtracting Rational Expressions	389
6.6	Complex Fractions	400
6.7	Solving Equations That Contain Rational Expressions	407
6.8	Application of Equations That Contain Rational Expressions	414
Chapter 7 - More Equations, Inequalities, and Factoring		427
7.1	Review of Equations and Inequalities	428
7.2	Equations Containing Absolute Values	441
7.3	Inequalities Containing Absolute Values	446
7.4	Review of Factoring	451
7.5	Review of Rational Expressions	464
7.6	Synthetic Division	478

Chapter 8 - Writing Equations of Lines, Functions, and Variation	492
8.1 A Review of the Rectangular Coordinate System	493
8.2 Slope of a Non-Vertical Line	502
8.3 Writing Equations of Lines	512
8.4 A Review of Functions	525
8.5 Graphs of Non-Linear Functions	535
8.6 Variation	548
Chapter 9 - Radicals and Rational Exponents	567
9.1 Radical Expressions	568
9.2 Applications of Radicals	580
9.3 Rational Exponents	587
9.4 Simplifying and Combining Radical Expressions	595
9.5 Multiplying and Dividing Radical Expressions	605
9.6 Radical Equations	613
9.7 Complex Numbers	622
Chapter 10 - Quadratic Functions, Inequalities, and Algebra of Functions	641
10.1 Solving Quadratic Equations by Completing the Square	642
10.2 Solving Quadratic Equations by the Quadratic Formula	652
10.3 The Discriminant and Equations That Can Be Written in Quadratic Form	659
10.4 Graphs of Quadratic Functions	665
10.5 Quadratic and Other Non-Linear Inequalities	677
10.6 Algebra and Composition of Functions	686
10.7 Inverses of Functions	694
Chapter 11 - Exponential and Logarithmic Functions	712
11.1 Exponential Functions	713
11.2 Base-e Exponential Functions	724
11.3 Logarithmic Functions	732
11.4 Base-e Logarithms	742
11.5 Properties of Logarithms	748
11.6 Exponential and Logarithmic Equations	757

Chapter 12 - Conic Sections and More Graphing	775
12.1 The Circle and the Parabola	776
12.2 The Ellipse	789
12.3 The Hyperbola	798
12.4 Piecewise Defined Functions and the Greatest Integer Function	808
Chapter 13 - More on Systems of Equations and Inequalities	820
13.1 Solutions of Two Equations in Two Variables	821
13.2 Solutions of Three Equations in Three Variables	834
13.3 Solution by Matrices	844
13.4 Solution by Determinants	853
13.5 Solving Simultaneous Second-Degree Equations and Inequalities	863
Chapter 14 - Miscellaneous Topics	876
14.1 The Binomial Theorem	877
14.2 The n th Term of a Binomial Expansion	883
14.3 Arithmetic Sequences	885
14.4 Geometric Sequences	893
14.5 Infinite Geometric Sequences	900
14.6 Permutations and Combinations	904