

Preface vii

How to Use This Book x

NUMBER AND QUANTITY

The Real Number System 1

Extend the properties of exponents to rational
exponents 1

Quantities 1

Reason quantitatively and use units to solve problems 1

The Complex Number System 2

Perform arithmetic operations with complex numbers 2

Vector and Matrix Quantities 3

Represent and model with vector quantities 3

Perform operations on matrices and use matrices
in applications 3

ALGEBRA

Seeing Structure in Expressions 6

Interpret the structure of expressions 6

Write expressions in equivalent forms to solve
problems 9

Arithmetic with Polynomials and Rational Expressions 11

Perform arithmetic operations on polynomials 11

Use polynomial identities to solve problems 12

Creating Equations 13

Create equations that describe numbers or relationships 13

Reasoning with Equations and Inequalities 16

Understanding solving equations as a process of reasoning
and explain the reasoning 16

Solve equations and inequalities in one variable 19

Solve systems of equations 21

Represent and solve equations and inequalities
graphically 23

FUNCTIONS

Interpreting Functions 24

Understand the concept of a function and use function
notation 24

Interpret functions that arise in applications in terms of
the context 28

Analyze functions using different representations 33

Building Functions 38

Build a function that models a relationship between two
quantities 38

Build new functions from existing functions 41

Linear, Quadratic, and Exponential Models 43

Construct and compare linear and exponential models
and solve problems 43

Interpret expressions for functions in terms of the situation they model	46
Trigonometric Functions	47
Extend the domain of trigonometric functions using the unit circle	47
Model periodic phenomena with trigonometric functions	49
Prove and apply trigonometric identities.....	50
GEOMETRY	
Congruence	51
Experiment with transformations in the plane	51
Understand congruence in terms of rigid motions.....	53
Prove geometric theorems	55
Make geometric constructions	62
Similarity, Right Triangles, and Trigonometry	63
Understand similarity in terms of similarity transformations.....	63
Prove theorems involving similarity	64
Apply trigonometry to general triangles	65
Circles	66
Understand and apply theorems about circles	66
Find arc lengths and areas of sectors of circles.....	67

Expressing Geometric Properties with Equations	68
Translate between the geometric description and the equation for a conic section.....	68
Use coordinates to prove simple geometric theorems algebraically.....	71
Geometric Measurement and Dimension	72
Explain volume formulas and use them to solve problems	72
Visualize relationships between two-dimensional and three-dimensional objects.....	73
Modeling with Geometry	74
Apply geometric concepts in modeling situations	74
STATISTICS AND PROBABILITY	
Interpreting Categorical and Quantitative Data	78
Summarize, represent, and interpret data on a single count or measurable variable	78
Summarize, represent, or interpret data on two categorical and quantitative variables	82
Interpret linear models.....	89
Making Inferences and Justifying Conclusions	90
Understand and evaluate random processes underlying statistical experiments.....	90
Make inferences and justify conclusions from sample surveys, experiments, and observational studies	92

Conditional Probability and the Rules of Probability93

Understand independence and conditional probability and
use them to interpret data93

Use the rules of probability to compute probabilities of
compound events in a uniform probability model96

Using Probability to Make Decisions..... 100

Calculate expected values and use them to solve
problems100