

# Contents

Preface .....	xiii
---------------	------



## Sets

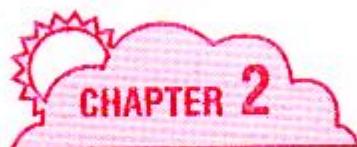
<b>LESSON 1 Basic Ideas About Sets .....</b>	<b>2</b>
----------------------------------------------	----------

The Notion of Sets.....	3
Elements of a Set .....	4
Equal Sets.....	5
Methods of Representing a Set .....	6
Empty Sets and Universal Sets .....	10
Subsets of a Set .....	11
<i>Gauging What You Have Learned.....</i>	<i>14</i>

<b>LESSON 2 Operations on Sets .....</b>	<b>16</b>
------------------------------------------	-----------

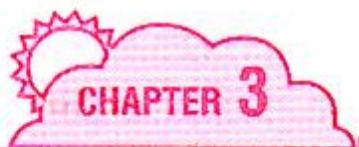
Complement of a Set.....	17
Union of Sets .....	18
Intersection of Sets.....	18
Set Difference .....	20
Venn Diagrams .....	21
<i>Gauging What You Have Learned.....</i>	<i>30</i>

Math Links.....	32
Famous Mathematicians .....	33
Chapter Output.....	34
Chapter Challenger .....	35
Performance Task .....	36
Key Terms .....	37
Reflective Learning .....	37
Chapter Assessment .....	38

**CHAPTER 2****The Real Number System**

<b>LESSON 1 Integers.....</b>	<b>43</b>
Positive and Negative Integers .....	44
Number Lines.....	45
Opposites of Integers .....	46
Absolute Values of Integers.....	47
Operations on Integers .....	48
<i>Gauging What You Have Learned</i> .....	60
<b>LESSON 2 Rational and Irrational Numbers .....</b>	<b>62</b>
Rational Numbers as Fractions.....	63
Conversion of Rational Numbers to Decimals.....	64
Conversion of Decimals to Fractions.....	66
Opposites of Real Numbers .....	69
More Examples of Irrational Numbers .....	70
Square Root of a Number.....	71
Approximations of Square Roots of Numbers....	73
<i>Gauging What You Have Learned</i> .....	77
<b>LESSON 3 The Basic Operations and Their Properties .....</b>	<b>80</b>
Symbols and Grouping.....	81
Properties of Addition .....	82
Subtraction Expressed in Terms of Addition .....	84
Properties of Multiplication .....	85
Division Expressed in Terms of Multiplication.....	86
Absolute Values of Real Numbers.....	87
Operations on Rational Numbers.....	88
<i>Gauging What You Have Learned</i> .....	95

Math Links .....	98
Famous Mathematicians .....	99
Chapter Output .....	100
Chapter Challenger .....	101
Performance Task .....	102
Key Terms .....	103
Reflective Learning .....	104
Chapter Assessment .....	104



## CHAPTER 3 Measurements

<b>LESSON 1 Length and Mass .....</b>	<b>108</b>
Brief History of Measurement.....	109
SI Units of Length.....	109
Measurement of Length.....	112
Conversion of an SI Unit of Length to Another.....	115
Non-SI Units of Length.....	116
Conversion of a Non-SI Unit of Length to Another .....	117
Conversion of a Non-SI Unit of Length to an SI Unit of Length .....	119
SI Units of Mass.....	122
Measurement of Mass .....	123
Conversion of an SI Unit of Mass to Another ...	124
Conversion of a Non-SI Unit of Mass to Another Non-SI Unit or to an SI Unit of Mass.....	126
<i>Gauging What You Have Learned</i> .....	128
<b>LESSON 2 Area and Volume.....</b>	<b>131</b>
Area.....	132
Volume.....	137
<i>Gauging What You Have Learned</i> .....	142

<b>LESSON 3 Temperature, Time, and Electricity Consumption .....</b>	<b>145</b>
Temperature.....	146
Time .....	153
Electricity Consumption .....	155
<i>Gauging What You Have Learned</i> .....	159
Math Links.....	162
Famous Mathematicians .....	163
Chapter Output.....	164
Chapter Challenger .....	166
Performance Task .....	167
Key Terms .....	169
Reflective Learning .....	170
Chapter Assessment .....	170



## Algebraic Expressions

<b>LESSON 1 Expressions with Exponents .....</b>	<b>175</b>
Natural Numbers as Exponents.....	177
Terms in an Algebraic Expression .....	179
Evaluation of Algebraic Expressions .....	179
Laws of Exponents .....	181
Zero and Negative Integers as Exponents.....	186
Scientific Notation.....	194
<i>Gauging What You Have Learned</i> .....	198
<b>LESSON 2 Polynomials .....</b>	<b>201</b>
Monomials, Binomials, and Trinomials .....	203
Degrees of Polynomials.....	204
Numerical and Literal Coefficients.....	205
Operations on Polynomials.....	205
<i>Gauging What You Have Learned</i> .....	218

**LESSON 3 Special Products ..... 220**

Translations of Some Verbal Phrases Into Algebraic Expressions and Vice Versa.....	220
Multiplication of Two Binomials	
Using Area Models .....	222
Products Involving Binomials .....	225
<i>Gauging What You Have Learned</i> .....	232
Math Links .....	234
Famous Mathematicians.....	235
Chapter Output .....	236
Chapter Challenger .....	237
Performance Task .....	238
Key Terms .....	239
Reflective Learning .....	240
Chapter Assessment .....	240



## Linear Equations and Inequalities in One Variable

**LESSON 1 Linear Equations in One Variable ..... 245**

Types of Equations.....	247
Solutions to Linear Equations in One Variable.....	248
Isolation of a Variable from an Equation with More Than One Variable.....	262
<i>Gauging What You Have Learned</i> .....	265

**LESSON 2 Linear Inequalities in One Variable ..... 267**

Linear Inequalities.....	268
Equivalent Linear Inequalities .....	271
Properties of Inequality .....	272
<i>Gauging What You Have Learned</i> .....	282

## **LESSON 3 Word Problems Involving Linear Equations or Inequalities in One Variable ..... 284**

Translation of Word Expressions into Algebraic Expressions .....	285
Word Problems Leading to Linear Equations.....	287
Word Problems Leading to Linear Inequalities.....	293
<i>Gauging What You Have Learned</i> .....	295

<b>Math Links .....</b>	298
Famous Mathematicians .....	299
Chapter Output.....	300
Chapter Challenger .....	302
Performance Task .....	303
Key Terms .....	304
Reflective Learning .....	305
Chapter Assessment.....	306



## **Geometric Shapes**

### **LESSON 1 Points, Lines, and Planes ..... 310**

Undefined Terms in Geometry .....	311
Collinear Points and Coplanar Points and Lines .....	314
Segments .....	315
Rays .....	318
Intersecting, Parallel, Concurrent, and Skew Lines .....	320
Parallel Planes .....	323
<i>Gauging What You Have Learned</i> .....	324

### **LESSON 2 Angles and Their Geometric Relations ..... 328**

Basic Concepts on Angles .....	329
Angle Measures.....	330

Kinds of Angles .....	331
Angle Pairs .....	334
Angles Formed by Parallel Lines Cut by a Transversal.....	342
Basic Geometric Constructions .....	346
<i>Gauging What You Have Learned</i> .....	357
<b>LESSON 3 Triangles .....</b>	<b>364</b>
Basic Concepts on Triangles.....	364
Classification of Triangles .....	366
Relations Among the Angles and Sides of a Triangle.....	369
<i>Gauging What You Have Learned</i> .....	377
<b>LESSON 4 Quadrilaterals .....</b>	<b>382</b>
Basic Concepts on Quadrilaterals .....	383
Classification of Quadrilaterals .....	383
Relations Among the Angles and Sides of a Quadrilateral.....	385
<i>Gauging What You Have Learned</i> .....	389
<b>LESSON 5 Polygons and Circles .....</b>	<b>391</b>
Basic Concepts on Polygons.....	391
Classification of Polygons .....	393
Regular Polygons.....	398
Number of Diagonals in a Polygon.....	399
Relations of Angles in a Convex Polygon.....	400
Basic Concepts on Circles .....	405
<i>Gauging What You Have Learned</i> .....	410
<b>Math Links .....</b>	<b>414</b>
<b>Famous Mathematicians .....</b>	<b>415</b>
<b>Chapter Output .....</b>	<b>416</b>
<b>Chapter Challenger .....</b>	<b>419</b>

Performance Task .....	420
Key Terms .....	422
Reflective Learning .....	423
Chapter Assessment .....	424



## Introduction to Statistics

<b>LESSON 1 What Statistics Is All About .....</b>	<b>428</b>
Importance of Statistics .....	429
Areas of Statistics .....	430
Population and Sample .....	430
Census and Survey .....	431
Types of Variables .....	431
Scales of Measurement .....	433
Data Collection and Sampling Techniques.....	435
<i>Gauging What You Have Learned .....</i>	<i>440</i>
<b>LESSON 2 Data Presentation .....</b>	<b>442</b>
Tabular Presentation Using Frequency Distribution Tables .....	443
Graphical Presentation.....	455
<i>Gauging What You Have Learned .....</i>	<i>460</i>
Math Links .....	463
Famous Mathematicians .....	464
Chapter Output.....	465
Chapter Challenger .....	466
Performance Task.....	467
Key Terms .....	468
Reflective Learning .....	469
Chapter Assessment .....	469



## Numerical Measures

### LESSON 1 Measures of Central Tendency of Ungrouped and Grouped Data ..... 476

Grouped and Ungrouped Data .....	477
Mean .....	477
Median .....	482
Mode .....	486
<i>Gauging What You Have Learned</i> .....	491

### LESSON 2 Measures of Variability ..... 493

Range .....	494
Average Deviation.....	496
Variance and Standard Deviation.....	501
<i>Gauging What You Have Learned</i> .....	507

Math Links.....	508
Famous Mathematicians .....	509
Chapter Output.....	510
Chapter Challenger .....	511
Performance Task .....	512
Key Terms .....	513
Reflective Learning .....	513
Chapter Assessment.....	514

<i>Glossary</i> .....	517
-----------------------	-----

<i>Bibliography</i> .....	533
---------------------------	-----

<i>Index</i> .....	537
--------------------	-----