

# CONTENTS

Preface .....	ix
<b>CHAPTER 1 UNDERSTANDING SEQUENCES AND SERIES</b>	
Learning Competencies .....	1
Key Questions .....	2
Key Understandings .....	2
Knowledge Map .....	2
1.1 Arithmetic Sequences and Series .....	3
<i>Sequences and Series</i> .....	4
<i>General Term in a Sequence</i> .....	4
<i>Arithmetic Sequence</i> .....	6
<i>Arithmetic Series</i> .....	10
<i>Arithmetic Mean</i> .....	13
Progress Check .....	15
1.2 Geometric Sequences and Series .....	17
<i>Geometric Sequence</i> .....	17
<i>Geometric Series</i> .....	22
<i>Infinite Geometric Sequences and Series</i> .....	24
<i>Geometric Mean</i> .....	25
Progress Check .....	26
1.3 Fibonacci and Harmonic Sequences .....	27
<i>Harmonic Sequence</i> .....	27
<i>Harmonic Mean</i> .....	28
<i>Fibonacci Sequence</i> .....	29
Progress Check .....	31
Authentic Task	
<i>Spreading a Campaign</i> .....	31
Chapter Review .....	32
Assessment for Learning .....	33
Enrichment Activity .....	33
Assessment as Learning .....	34

Assessment of Learning .....	34
Websites for Online Math Links .....	36

## CHAPTER 2 UNDERSTANDING POLYNOMIALS AND POLYNOMIAL FUNCTIONS

Learning Competencies .....	37
Key Questions .....	38
Key Understandings .....	38
Knowledge Map .....	38
2.1 Polynomials .....	39
<i>Degree of a Polynomial</i> .....	39
<i>Operations of Polynomials</i> .....	40
<i>Long Division and Synthetic Division</i> .....	42
Progress Check .....	45
2.2 Polynomial Functions .....	46
<i>Evaluation of Polynomial Functions</i> .....	47
Progress Check .....	49
2.3 Remainder and Factor Theorems .....	50
<i>Remainder Theorem</i> .....	50
<i>Factor Theorem</i> .....	52
Progress Check .....	54
2.4 The Rational Root Theorem .....	56
<i>Descartes' Rule of Signs</i> .....	58
Progress Check .....	61
2.5 Graphs of Polynomial Functions .....	62
<i>Graphs of Linear and Quadratic Functions</i> .....	62
<i>Characteristics of the Graph of a Polynomial Function</i> .....	65
<i>Graphs of Higher Degree Polynomial Functions</i> .....	65
Progress Check .....	69
Authentic Task	
<i>My Childhood Graph</i> .....	70
Chapter Review .....	70
Assessment for Learning .....	71
Enrichment Activity .....	72
Assessment as Learning .....	73
Assessment of Learning .....	73
Websites for Online Math Links .....	76

## CHAPTER 3 UNDERSTANDING THEOREMS ON CIRCLES

Learning Competencies .....	77
Key Questions .....	78
Key Understandings .....	78
Knowledge Map .....	78
3.1 Definitions and Central Angles .....	79
<i>Definition</i> .....	79
<i>Central Angles</i> .....	79
Progress Check.....	84
3.2 Some Relationships Involving Arcs and Chords .....	87
<i>Inscribed Angles</i> .....	87
<i>Quadrilateral Inscribed in a Circle</i> .....	93
Progress Check.....	94
3.3 Arc of a Chord .....	99
Progress Check.....	104
3.4 Tangents, Secants, Angles, and Sectors.....	108
Progress Check.....	118
3.5 Tangents, Secants, and Segments.....	122
Progress Check.....	128
Authentic Task	
<i>Comparing Pizza Slices</i> .....	134
Chapter Review.....	135
Assessment for Learning.....	137
Enrichment Activity.....	137
Assessment as Learning.....	137
Assessment of Learning .....	138
Websites for Online Math Links.....	142

## CHAPTER 4 UNDERSTANDING COORDINATE GEOMETRY

Learning Competencies .....	143
Key Questions .....	143
Key Understandings .....	144
Knowledge Map .....	144
4.1 Circles in a Coordinate System .....	145
<i>Cartesian Coordinate System</i> .....	145
<i>Distance between Two Points</i> .....	146
Progress Check.....	150
4.2 Equation of a Circle .....	151
<i>Definition</i> .....	151
Progress Check.....	157

Authentic Task	
<i>Enclosing Circles</i> .....	158
Chapter Review.....	159
Assessment for Learning.....	160
Enrichment Activity.....	160
Assessment as Learning.....	160
Assessment of Learning.....	160
Websites for Online Math Links.....	161

## CHAPTER 5 UNDERSTANDING COMBINATORICS AND PROBABILITY

Learning Competencies.....	163
Key Questions.....	164
Key Understandings.....	165
Knowledge Map.....	165
5.1 Permutation.....	166
Fundamental Principle of Counting.....	166
Tree Diagram.....	167
Systematic Listing.....	168
Factorial Notation.....	170
<i>Permutations of <math>n</math> Different Objects Taken <math>n</math> at a Time</i> .....	172
<i>Permutations of <math>n</math> Different Objects Taken <math>r</math> at a Time</i> .....	172
<i>Permutations with <math>n</math> Similar Objects</i> .....	173
<i>Circular Permutations</i> .....	173
Progress Check.....	175
5.2 Combination.....	176
Progress Check.....	179
5.3 Probability of Events.....	181
<i>Simple Probability</i> .....	181
<i>Probability of Two Events</i> .....	182
<i>Probability of the Union of Two Events</i> .....	183
<i>Mutually Exclusive and Non-mutually Exclusive Events</i> .....	183
Progress Check.....	186
Authentic Task	
<i>Decode the Message</i> .....	187
Chapter Review.....	189
Assessment for Learning.....	190
Enrichment Activity.....	191
Assessment as Learning.....	192
Assessment of Learning.....	192
Websites for Online Math Links.....	196

## CHAPTER 6 UNDERSTANDING MEASURES OF POSITION

Learning Competencies.....	197
Key Questions.....	198
Key Understandings.....	198
Knowledge Map.....	198
6.1 Deciles and Percentiles.....	199
<i>Percentiles for Ungrouped Data</i> .....	199
<i>Percentiles for Grouped Data</i> .....	202
<i>Deciles for Ungrouped Data</i> .....	205
<i>Deciles for Grouped Data</i> .....	208
Progress Check.....	210
6.2 Quartiles.....	213
<i>Quartiles for Ungrouped Data</i> .....	214
<i>Quartiles for Grouped Data</i> .....	216
<i>Interquartile Range</i> .....	218
Progress Check.....	221
Authentic Task	
<i>Conducting a Mini-Research</i> .....	223
Chapter Review.....	224
Assessment for Learning.....	225
Enrichment Activity.....	226
Assessment as Learning.....	226
Assessment of Learning.....	227
Websites for Online Math Links.....	230
<b>Glossary</b> .....	231
<b>Bibliography</b> .....	235
<b>References</b> .....	239
<b>Index</b> .....	241