

**Wah Yan College Kowloon**  
**F.4 Mathematics Scheme of Work (2017-2018)**

<b>Textbook</b>	1. NSS Mathematics in Action (2nd Edition) 4A 2. NSS Mathematics in Action (2nd Edition) 4B 3. NSS Mathematics in Action (2nd Edition) 5A
<b>Other Resources</b>	

◆ **Repertoire of Self-directed Learning Skills:**

1. reading to learn, 2. notes-taking, 3. looking up words in the dictionary, 4. pre-lesson preparation, 5. group discussion, 6. group presentation, 7. initiative to ask questions, 8. setting learning objectives and doing reflection, 9. eLearning platform with instant feedback, 10. flipped classroom, 11. peer assessment, 12. searching for information on the internet, 13. project learning, 14. training of higher-order thinking skills, etc.

**SL:** Scheduled number of lessons

**AL:** Actual number of lessons

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills◆	Values <sup>#</sup>	Basic Law Education
First Term (3/9/2017- 30/12/2017, Weeks 1-17)	1-3	<i>Chapter 1 – Quadratic Equations in One Unknown (I)</i>	1.1 Real Number System A Integers B Rational Numbers C Irrational Numbers D Real Numbers • Understand the hierarchy of the real number system. • Discuss the conversion between recurring decimals and fractions. • Teachers should introduce different kinds of numbers in the real number system. • Illustrate the conversion of recurring decimals into	1	Example 1.1 Teaching Example 1.1 <b>5-Minute Lecture:</b> Real Number System	Ex. 1A (p. 1.11) Level 1: 1 – 9 Level 2: 10 – 15  Rev. Ex. 1 (p. 1.51) Level 1: 1 – 3 Level 2: 42	eLearning platform with instant feedback eWorksheet in eclass with solution	1, 7, 9, 17	

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			fractions with examples.						
			<p>1.2 Solving Quadratic Equations by the Factor Method</p> <p>A Roots of Quadratic Equations</p> <p>B Factor Method</p> <ul style="list-style-type: none"> <li>• Understand the general form of a quadratic equation in one unknown and its roots.</li> <li>• Solve the quadratic equation <math>ax^2 + bx + c = 0</math> using the factor method.</li> <li>• Teachers should introduce the general form of quadratic equations <math>ax^2 + bx + c = 0</math>.</li> <li>• Teachers should introduce the idea of the roots of a quadratic equation.</li> <li>• Illustrate how to solve quadratic equation by the factor method with examples.</li> <li>• Demonstrate some quadratic equations that can be solved using identities.</li> <li>• Teachers may encourage students to read the <i>Investigation Corner</i> on p. 1.64.</li> </ul>	2	<p>Examples 1.2 – 1.6</p> <p>Teaching Examples 1.2 – 1.6</p> <p>Teaching Example (Extra) 1.4</p> <p><b>5-Minute Lecture:</b> Quadratic Equations in One Unknown</p> <p><b>5-Minute Lecture:</b> Solving Quadratic Equations by the Factor Method</p> <p><b>Drilling Program:</b> Solving Quadratic Equations by the Factor Method</p>	<p>Ex. 1B (p. 1.19)</p> <p>Level 1: 1 – 24</p> <p>Level 2: 25 – 42</p> <p>Rev. Ex. 1 (p. 1.51)</p> <p>Level 1: 4 – 8, 17 – 18</p> <p>Level 2: 41</p>			

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			<p>1.3 Solving Quadratic Equations by the Quadratic Formula</p> <p>A Method of Taking Square Roots</p> <p>B Quadratic Formula</p> <ul style="list-style-type: none"> <li>• Solve the quadratic equation in the form <math>(x + m)^2 = n</math> by taking square roots.</li> <li>• Understand the quadratic formula.</li> <li>• Solve quadratic equations using the quadratic formula.</li> <li>• Demonstrate some quadratic equations that can be solved by taking square roots on both sides with examples.</li> <li>• Teachers may demonstrate how to derive the quadratic formula.</li> <li>• Illustrate how to use the quadratic formula to solve quadratic equations with examples.</li> <li>• Teachers may use <i>Maths Dialogue</i> on p.1.26 to let students explore how to solve quadratic equations involving fractions.</li> </ul>	3	<p>Examples 1.7 – 1.10</p> <p>Teaching Examples 1.7 – 1.10</p> <p>Teaching Example (Extra) 1.10</p> <p><b>5-Minute Lecture:</b> Solving Quadratic Equations by the Quadratic Formula</p>	<p>Ex. 1C (p. 1.27)</p> <p>Level 1: 1 – 18</p> <p>Level 2: 19 – 32</p> <p>Rev. Ex. 1 (p. 1.51)</p> <p>Level 1: 9 – 16</p> <p>Level 2: 29 – 40, 42</p>			

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			<p>1.4 Solving Quadratic Equations by the Graphical Method</p> <ul style="list-style-type: none"> <li>• Solve the equation <math>ax^2 + bx + c = 0</math> by plotting the graph of <math>y = ax^2 + bx + c</math> and reading the <math>x</math>-intercepts.</li> <li>• Understand the approximate nature of the roots obtained by using the graphical method.</li> <li>• Teachers may use examples to illustrate that the quadratic equation <math>ax^2 + bx + c = 0</math> can be solved graphically by reading the <math>x</math>-intercept(s) of the graph of <math>y = ax^2 + bx + c</math>.</li> <li>• Teachers should stress that the roots found by the graphical method are approximate values only.</li> <li>• Teachers may use <i>IT Activity 1.1</i> on p. 1.65 to let students explore how to solve a quadratic equation graphically.</li> <li>• Teachers should summarize the relationship between the number of <math>x</math>-intercepts of the graph of</li> </ul>	4	<p>Examples 1.11 – 1.14</p> <p>Teaching Examples 1.11 – 1.14</p> <p>Teaching Example (Extra) 1.14</p> <p><b>5-Minute Lecture:</b> Solving Quadratic Equations by the Graphical Method</p> <p><b>IT Activity 1.1:</b> Solving a quadratic equation graphically</p>	<p>Ex. 1D (p. 1.34)</p> <p>Level 1: 1 – 12</p> <p>Level 2: 13 – 22</p> <p>Rev. Ex. 1 (p. 1.51)</p> <p>Level 1: 19 – 22</p> <p>Level 2: 44 – 45</p>			

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			$y = ax^2 + bx + c$ and the nature of roots of $ax^2 + bx + c = 0$ . • Teachers may use <i>Maths Dialogue</i> on p.1.33 to let students learn how to choose an appropriate range of $x$ when solving a quadratic equation graphically.						
			1.5 Problems Leading to Quadratic Equations • Solve real-life problems that involve quadratic equations. • Illustrate how to solve some number problems, geometric problems and real-life problems by formulating quadratic equations with examples.	3	Examples 1.15 – 1.18 Teaching Examples 1.15 – 1.18 Teaching Example (Extra) 1.17 <b>5-Minute Lecture:</b> Problems Leading to Quadratic Equations	Ex. 1E (p. 1.43) Level 1: 1 – 13 Level 2: 14 – 23  Rev. Ex. 1 (p. 1.51) Level 1: 23 – 28 Level 2: 46 – 53			
	4-6	<b>Chapter 2 – Quadratic Equations in One Unknown (II)</b>	2.1 Nature of Roots of a Quadratic Equation A The Discriminant of a Quadratic Equation B Graph of a Quadratic Equation • Understand the relation between the discriminant of a quadratic equation and the	5	Examples 2.1 – 2.5 Teaching Examples 2.1 – 2.5 Teaching Example (Extra) 2.3 <b>5-Minute Lecture:</b> Nature of Roots of a Quadratic Equation	Ex. 2A (p. 2.12) Level 1: 1 – 18 Level 2: 19 – 31  Rev. Ex. 2 (p. 2.42) Level 1: 1 – 10, 26	eLearning platform with instant feedback eWorksheet in eclass with solution	1, 7, 9, 17	

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			<p>nature of its roots.</p> <ul style="list-style-type: none"> <li>• Understand the relation between the discriminant of <math>ax^2 + bx + c = 0</math> and the number of x-intercepts of the graph of <math>y = ax^2 + bx + c</math>.</li> <li>• Teachers should explain the relations among the discriminant of a quadratic equation, the nature of its roots and the number of x-intercepts of its graph.</li> </ul>		<p><b>Extra IT Activity:</b> Graph of a quadratic equation and its discriminant</p>	<p>Level 2: 31 – 35, 44 – 46</p> <p>Quiz 1 Ch.1</p>			
			<p>2.2 Forming a Quadratic Equation with Given Roots</p> <ul style="list-style-type: none"> <li>• Form a quadratic equation with given roots. (The given roots are confined to real numbers.)</li> <li>• Form a quadratic equation using the sum and product of its roots. NF</li> <li>• Illustrate with examples how to form quadratic equations with given roots by reversing the process of solving quadratic equations by the factor method.</li> <li>• Illustrate with examples how to form quadratic equations using the sum and product of its roots.</li> </ul>	2	<p>Examples 2.6 – 2.7 Teaching Examples 2.6 – 2.7</p> <p><b>5-Minute Lecture:</b> Forming a Quadratic Equation with Given Roots</p>	<p>Ex. 2B (p. 2.17) Level 1: 1 – 11 Level 2: 12 – 17</p> <p>Rev. Ex. 2 (p. 2.42) Level 1: 20</p>			

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			<p><b>NF</b> 2.3 Relations between Roots and Coefficients</p> <ul style="list-style-type: none"> <li>• Understand the relations between the roots and coefficients of a quadratic equation.</li> <li>• Learn how to form a quadratic equation whose roots are related to the roots of another quadratic equation.</li> <li>• Teachers should introduce the relation between the sum / product of roots of a quadratic equation and its coefficients.</li> <li>• Illustrate how to find the values of expressions which are in terms of the roots of a quadratic equation.</li> <li>• Teachers may use the examples to illustrate how to form a quadratic equation whose roots are related to the roots of another quadratic equation.</li> <li>• Teachers may use <i>To Learn More</i> on p.2.23 to teach how to obtain useful information of the graph of <math>y = ax^2 + bx + c</math>, using the sum and the product of roots of a quadratic equation <math>ax^2 + bx + c = 0</math>.</li> </ul>	5	<p>Examples 2.8 – 2.12</p> <p>Teaching Examples 2.8 – 2.12</p> <p>Teaching Examples (Extra) 2.11 – 2.12</p> <p><b>5-Minute Lecture:</b> Sum and Product of Roots</p>	<p>Ex. 2C (p. 2.24)</p> <p>Level 1: 1 – 17</p> <p>Level 2: 18 – 34</p> <p>Rev. Ex. 2 (p. 2.42)</p> <p>Level 1: 11 – 19, 21 – 25</p> <p>Level 2: 36 – 38, 40 – 43, 47</p>			

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			<ul style="list-style-type: none"> <li>Teachers may encourage students to read the Investigation Corner on p. 2.53.</li> </ul>						
			<p>2.4 Complex Number System A Complex Numbers</p> <p><b>NF</b> B Operations of Complex Numbers</p> <ul style="list-style-type: none"> <li>Introduce the historical development of complex numbers.</li> <li>Introduce the definition of <math>i</math>.</li> <li>Introduce the system of complex numbers <math>a + bi</math>.</li> <li>Define and perform addition, subtraction, multiplication and division of complex numbers.</li> <li>Teachers may use <i>To Learn More</i> on p.2.30 to introduce the powers of <math>i</math> following the pattern <math>i, -1, -i, 1, i, -1, -i, 1, \dots</math></li> <li>Make sure students can identify real part and imaginary part in a complex number.</li> <li>Further discuss the hierarchy of the number system when complex numbers are introduced.</li> </ul>	4	<p>Examples 2.13 – 2.19</p> <p>Teaching Examples 2.13 – 2.19</p> <p>Teaching Examples (Extra) 2.17, 2.19</p> <p><b>5-Minute Lecture:</b> Introduction to Complex Numbers</p> <p><b>Drilling Program:</b> Operations of Complex Numbers</p> <p><b>5-Minute Lecture:</b> Operations of Complex Numbers</p>	<p>Ex. 2D (p. 2.37)</p> <p>Level 1: 1 – 26</p> <p>Level 2: 27 – 39</p> <p>Rev. Ex. 2 (p. 2.42)</p> <p>Level 1: 27 – 30</p> <p>Level 2: 39, 48 – 56</p>			



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			<ul style="list-style-type: none"> <li>• Illustrate the rules of addition, subtraction, multiplication and division of complex numbers with examples.</li> </ul>						
	6-8	<b>Chapter 3 – Functions and Graphs</b>	<p>3.1 Introduction to Functions A Concepts of Functions B Different Representations of Functions</p> <ul style="list-style-type: none"> <li>• Recognize the intuitive concept of functions.</li> <li>• Recognize the concepts of independent and dependent variables.</li> <li>• Recognize the concepts of domain, co-domain and range of a function.</li> <li>• Recognize the algebraic, tabular and graphical representations of a function.</li> <li>• Teachers should introduce the concept of functions.</li> <li>• Teachers should ensure that students can distinguish independent variables from dependent variables, and can distinguish domain from range and co-domain.</li> <li>• Teachers should use examples to illustrate the algebraic, tabular and graphical representations of a function.</li> </ul>	2	<p>Examples 3.1 – 3.4 Teaching Examples 3.1 – 3.4 Teaching Example (Extra) 3.3</p> <p><b>5-Minute Lecture:</b> Concept of a Function</p> <p><b>Teaching Tool:</b> Determination of Functions</p>	<p>Ex. 3A (p. 3.13) Level 1: 1 – 16 Level 2: 17 – 26</p> <p>Rev. Ex. 3 (p. 3.54) Level 1: 1 – 10</p> <p>Quiz 2 Ch.2</p>	<p>eLearning platform with instant feedback eWorksheet in eclass with solution</p>	1, 7, 9, 17	

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			<ul style="list-style-type: none"> <li>• Make sure students can determine whether <math>y</math> is a function of <math>x</math>, given the relationship between <math>x</math> and <math>y</math>.</li> </ul>						
			<p>3.2 Notation of a Function</p> <p>A Basic Notation</p> <p>B Values of a Function</p> <ul style="list-style-type: none"> <li>• Recognize the notation of a function.</li> <li>• Find the values of functions.</li> <li>• Teachers should introduce the notation of a function.</li> <li>• Illustrate how to find the values of functions with examples.</li> <li>• Illustrate the operations of functions with examples.</li> </ul>	2	<p>Examples 3.5 – 3.9</p> <p>Teaching Examples 3.5 – 3.9</p> <p>Teaching Example (Extra) 3.8</p> <p><b>5-Minute Lecture:</b></p> <p>Notation of a Function</p>	<p>Ex. 3B (p. 3.20)</p> <p>Level 1: 1 – 15</p> <p>Level 2: 16 – 30</p> <p>Rev. Ex. 3 (p. 3.54)</p> <p>Level 1: 11 – 18</p> <p>Level 2: 42 – 46</p>			
			<p>3.3 Some Common Functions and their Graphs</p> <p>A Constant Functions</p> <p>B Linear Functions</p> <p>C Quadratic Functions</p> <ul style="list-style-type: none"> <li>• Understand the features of the graph of a constant function.</li> <li>• Understand the features of the graph of a linear function.</li> <li>• Understand the features of the</li> </ul>	5	<p>Examples 3.10 – 3.13</p> <p>Teaching Examples 3.10 – 3.13</p> <p>Teaching Example (Extra) 3.13</p> <p><b>5-Minute Lecture:</b></p> <p>Some Common Functions and their</p>	<p>Ex. 3C (p. 3.33)</p> <p>Level 1: 1 – 19</p> <p>Level 2: 20 – 28</p> <p>Rev. Ex. 3 (p. 3.54)</p> <p>Level 1: 19 – 28</p> <p>Level 2: 49, 53 –</p>			

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			<p>graph of a quadratic function.</p> <ul style="list-style-type: none"> <li>• Teachers should introduce the features of the graphs of a constant function and a linear function.</li> <li>• Teachers should introduce the concepts of <math>x</math>-intercept and <math>y</math>-intercept.</li> <li>• Teachers may use <i>Activity 3.1</i> (or <i>IT Activity 3.1</i> on p. 3.69) to let students explore the features of the graph of a quadratic function in the form <math>y = ax^2 + bx + c</math>.</li> <li>• Illustrate how to find the features of quadratic graphs with examples.</li> </ul>		<p>Graphs – Constant Functions &amp; Linear Functions</p> <p><b>5-Minute Lecture:</b> Some Common Functions and their Graphs – Quadratic Functions</p> <p><b>Animation:</b> Features of Quadratic Graphs</p> <p><b>Teaching Tool:</b> Graph of a Quadratic Function</p> <p><b>IT Activity 3.1:</b> Graphs of quadratic functions in the form <math>y = ax^2 + bx + c</math></p> <p><b>Extra IT Activity:</b> Comparing graphs of linear functions and quadratic functions</p>	54			
			3.4 Optimum Values of	6	Examples 3.14 –	Ex. 3D (p. 3.46)			

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			<p>Quadratic Functions</p> <p>A Quadratic Functions in the Form <math>y = a(x - h)^2 + k</math></p> <p><b>NF</b>B Finding the Optimum Values of Quadratic Functions by the Algebraic Method</p> <p><b>NF</b>C Practical Problems in Finding Optimum Values of Quadratic Functions</p> <ul style="list-style-type: none"> <li>• Understand the optimum value of the quadratic function <math>y = a(x - h)^2 + k</math> and the features of its graph.</li> <li>• Understand the method of completing the square. <b>NF</b></li> <li>• Find the optimum value of the quadratic function <math>y = ax^2 + bx + c</math> by the algebraic method. <b>NF</b></li> </ul> <p><b>S</b> Solve practical problems relating to the optimum value of a quadratic function. <b>NF</b></p> <ul style="list-style-type: none"> <li>• Teachers may use <i>Activity 3.2</i></li> </ul>		<p>3.18</p> <p>Teaching Examples 3.14 – 3.18</p> <p>Teaching Examples (Extra) 3.14, 3.18</p> <p><b>5-Minute Lecture:</b> Quadratic Functions in the Form <math>y = a(x - h)^2 + k</math></p> <p><b>5-Minute Lecture:</b> Finding the Optimum Values of Quadratic Functions by the Algebraic Method</p> <p><b>IT Activity 3.2:</b> Graphs of quadratic functions in the form <math>y = a(x - h)^2 + k</math></p>	<p>Level 1: 1 – 24</p> <p>Level 2: 25 – 42</p> <p>Rev. Ex. 3 (p. 3.54)</p> <p>Level 1: 29 – 41</p> <p>Level 2: 47 – 48, 50 – 52, 55 – 62</p>			

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			<p>(or <i>IT Activity 3.2</i> on p. 3.70) to let students investigate the features of the graph of a quadratic function in the form <math>y = a(x - h)^2 + k</math>.</p> <ul style="list-style-type: none"> <li>• Teachers can introduce the idea of completing the square.</li> <li>• Teachers should demonstrate the conversion of function <math>y = ax^2 + bx + c</math> to the form <math>y = a(x - h)^2 + k</math>.</li> <li>• Illustrate how to solve problems relating to the optimum value of a quadratic function with examples.</li> <li>□ Teachers may encourage students to attempt the <i>Investigation Corner</i> on p. 3.68.</li> </ul>						
	9-10	<b>Chapter 4 – Equations of Straight Line</b>	<p>4.1 Equations of Straight Lines</p> <p>A Point-slope Form</p> <p>B Two-point Form</p> <p>C Slope-intercept Form</p> <p>D Equations of Special Straight Lines</p> <p>E Further Problems on Equations of Straight Lines</p> <ul style="list-style-type: none"> <li>• Understand and apply the point-slope form to find</li> </ul>	5.5	<p>Examples 4.1 – 4.7</p> <p>Teaching Examples 4.1 – 4.7</p> <p>Teaching Examples (Extra) 4.4, 4.7</p> <p><b>5-Minute Lecture:</b></p> <p>Point-slope Form of Equations of Straight Lines</p> <p><b>5-Minute Lecture:</b></p>	<p>Ex. 4A (p. 4.21)</p> <p>Level 1: 1 – 24</p> <p>Level 2: 25 – 42</p> <p>Rev. Ex. 4 (p. 4.53)</p> <p>Level 1: 1 – 6, 15 – 18</p> <p>Level 2: 28</p>	<p>eLearning platform with instant feedback</p> <p>eWorksheet in eclass with solution</p>	1, 7, 9, 17	

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			<p>equations of straight lines.</p> <ul style="list-style-type: none"> <li>• Understand and apply the two-point form to find equations of straight lines.</li> <li>• Understand and apply the slope-intercept form to find equations of straight lines.</li> <li>• Find the equations of oblique lines passing through the origin, horizontal lines and vertical lines.</li> <li>• Learn the techniques in solving problems involving equations of straight lines.</li> <li>• Teachers may use <i>Activity 4.1</i> to demonstrate how to find the equation of a straight line from its slope and a point on it.</li> <li>• Introduce the point-slope form of a straight line.</li> <li>• Demonstrate with examples how to use the point-slope form to find the equations of straight lines.</li> <li>• Introduce the two-point form of a straight line.</li> <li>• Demonstrate with examples how to use the two-point form to find the equations of straight lines.</li> <li>• Introduce the slope-intercept</li> </ul>		<p>Two-point Form of Equations of Straight Lines</p> <p><b>5-Minute Lecture:</b> Slope-intercept Form of Equations of Straight Lines</p> <p><b>5-Minute Lecture:</b> Equations of Special Straight Lines</p> <p><b>Drilling Program:</b> Equations of Straight Lines</p> <p><b>Animation:</b> Equations of Straight Lines</p> <p><b>IT Activity 4.1:</b> Explore the meanings of <math>m</math> and <math>c</math> in the graph of <math>y = mx + c</math></p>	Quiz 3 Ch.3			

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			<p>form of a straight line.</p> <ul style="list-style-type: none"> <li>• Demonstrate with examples how to use the slope-intercept form to find the equations of straight lines.</li> <li>• Illustrate how to find the equations of special straight lines.</li> <li>• Illustrate how to solve problems involving equations of straight lines.</li> <li>• Teachers may use <i>To Learn More</i> on p.4.20 to introduce the intercept form of a straight line.</li> </ul>						
			<p>4.2 General Form of Equation of a Straight Line</p> <ul style="list-style-type: none"> <li>• Understand the general form of equation of a straight line.</li> <li>• Explore the properties of a straight line from its equation in general form.</li> <li>• Teachers should introduce the general form of the equation of a straight line.</li> <li>• Show students how to find the slope, y-intercept and x-intercept from the general form of the equation of a straight line.</li> <li>• Teachers may use <i>Maths Dialogue</i> on p.4.31 to let</li> </ul>	2.5	<p>Examples 4.8 – 4.11</p> <p>Teaching Examples 4.8 – 4.11</p> <p>Teaching Example (Extra) 4.11</p> <p><b>5-Minute Lecture:</b> General Form of Equation of a Straight Line</p> <p><b>Extra IT Activity:</b> Properties of equations of straight</p>	<p>Ex. 4B (p. 4.32)</p> <p>Level 1: 1 – 18</p> <p>Level 2: 19 – 34</p> <p>Rev. Ex. 4 (p. 4.53)</p> <p>Level 1: 7 – 11, 19 – 23</p> <p>Level 2: 32 – 34, 37,</p> <p>39, 41, 44 – 45</p>			

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			students explore how to find the ranges of unknown values from the graph of a straight line.		lines in the general form				
			<p>4.3 Possible Intersection of Straight Lines</p> <p>A Finding the Coordinates of the Intersection of Non-parallel lines</p> <p>B Determining the Number of Intersections of Two Straight Lines</p> <ul style="list-style-type: none"> <li>• Solve problems involving intersection of straight lines on the coordinate plane.</li> <li>• Determine the number of intersections of two straight lines from their equations.</li> <li>• Revise the techniques in solving simultaneous linear equations in two unknowns.</li> <li>• Introduce the geometric meaning of the number of intersections of two straight lines on the coordinate plane.</li> </ul>	3	<p>Examples 4.12 – 4.16</p> <p>Teaching Examples 4.12 – 4.16</p> <p>Teaching Examples (Extra) 4.13, 4.16</p> <p><b>5-Minute Lecture:</b> Possible Intersection of Straight Lines</p> <p><b>Extra IT Activity:</b> Explore the number of intersections between two straight lines</p>	<p>Ex. 4C (p. 4.45)</p> <p>Level 1: 1 – 19</p> <p>Level 2: 20 – 33</p> <p>Rev. Ex. 4 (p. 4.53)</p> <p>Level 1: 12 – 14, 24 – 26</p> <p>Level 2: 27, 29 – 31, 35 – 36, 38, 40, 42 – 43</p>			



School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
	11-13	<b>Chapter 5 – More about Polynomials</b>	5.1 Revision on Polynomials A Monomials and Polynomials B Addition, Subtraction and Multiplication of Polynomials <ul style="list-style-type: none"> <li>• Review the concepts of monomials and polynomials, and the terminologies involved.</li> <li>• Review the basic operations (addition, subtraction and multiplication) of polynomials.</li> <li>• Make sure students have the basic knowledge of polynomials before learning the next section</li> </ul>	1	Examples 5.1 – 5.3 Teaching Examples 5.1 – 5.3 Teaching Example (Extra) 5.3 <b>5-Minute Lecture:</b> Revision on Polynomials	Ex. 5A (p. 5.9) Level 1: 1 – 12 Level 2: 13 – 26  Quiz 4 Ch.4	eLearning platform with instant feedback eWorksheet in eclass with solution	1, 7, 9, 17	
			5.2 Division of Polynomials A Method of Long Division B Division Algorithm <ul style="list-style-type: none"> <li>• Understand and manipulate long division of polynomials up to simple quadratic divisor.</li> <li>• Understand and apply division algorithm.</li> <li>• Teachers should demonstrate the method of long division with examples.</li> <li>• Make sure students</li> </ul>	4.5	Examples 5.4 – 5.9 Teaching Examples 5.4 – 5.9 Teaching Examples (Extra) 5.7, 5.9 <b>5-Minute Lecture:</b> Division of Polynomials	Ex. 5B (p. 5.17) Level 1: 1 – 19 Level 2: 20 – 37  Rev. Ex. 5 (p. 5.55) Level 1: 1 – 6 Level 2: 31 – 35, 39			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>understand the idea of division algorithm.</p> <ul style="list-style-type: none"> <li>Teachers may use <i>Maths Dialogue</i> on p. 5.14 to let students know that the coefficients of the terms in the quotient and the remainder need not be integers.</li> </ul>						
			<p>5.3 Remainder Theorem</p> <ul style="list-style-type: none"> <li>Understand and apply the remainder theorem.</li> <li>Remind students that function notations can be used to denote polynomials.</li> <li>Teachers may use <i>Activity 5.1</i> on p. 5.19 to let students explore the relationship between the remainder of <math>f(x) \div (x - a)</math> and the value of <math>f(a)</math>.</li> <li>Teachers may use the division algorithm to introduce the remainder theorem.</li> <li>Remind students that they must define <math>f(x)</math> before applying the remainder theorem.</li> <li>Illustrate the use of remainder theorem with examples.</li> </ul>	4.5	<p>Examples 5.10 – 5.14</p> <p>Teaching Examples 5.10 – 5.14</p> <p>Teaching Example (Extra) 5.10</p> <p><b>5-Minute Lecture:</b></p> <p>Remainder Theorem</p> <p><b>Drilling Program:</b></p> <p>Remainder Theorem</p>	<p>Ex. 5C (p. 5.24)</p> <p>Level 1: 1 – 21</p> <p>Level 2: 22 – 36</p> <p>Rev. Ex. 5 (p. 5.55)</p> <p>Level 1: 7 – 11</p> <p>Level 2: 36, 43, 45 – 46</p>			
			<p>5.4 Factor Theorem</p> <p>A Factor Theorem</p> <p>B Factorizing Polynomials</p>	5	<p>Examples 5.15 – 5.21</p> <p>Teaching Examples</p>	<p>Ex. 5D (p. 5.34)</p> <p>Level 1: 1 – 19</p> <p>Level 2: 20 – 37</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>by Factor Theorem</p> <ul style="list-style-type: none"> <li>• Understand and apply the factor theorem.</li> <li>• Understand and apply the converse of the factor theorem.</li> <li>• Use the factor theorem to factorize polynomials up to degree 3.</li> <li>• Teachers may use the remainder theorem to introduce the idea of the factor theorem.</li> <li>• Illustrate the use of factor theorem and its converse with examples.</li> <li>• Teachers may use <i>Activity 5.2</i> on p. 5.30 to let students explore the method to find the linear factors of a polynomial.</li> <li>• Illustrate how the factor theorem can be applied to factorize a cubic polynomial.</li> <li>• Teachers may encourage students to attempt the <i>Maths Dialogue</i> on p. 5.34.</li> <li>• Teachers may encourage students to attempt the <i>Investigation Corner</i> on p. 5.64 to explore a fast method to determine whether a 5-digit</li> </ul>		<p>5.15 – 5.21</p> <p>Teaching Example (Extra) 5.16</p> <p><b>5-Minute Lecture:</b> Factor Theorem</p> <p><b>5-Minute Lecture:</b> Factorizing Polynomials by Factor Theorem</p>	<p>Rev. Ex. 5 (p. 5.55)</p> <p>Level 1: 12 – 20</p> <p>Level 2: 37 – 38, 40 – 42, 44, 61</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			number is divisible by 11.						
			<p><b>NF</b> 5.5 H.C.F. and L.C.M. of Polynomials</p> <ul style="list-style-type: none"> <li>• Understand the concepts of the highest common factor (H.C.F.) and the lowest common multiple (L.C.M.) of polynomials. <b>NF</b></li> <li>• Learn how to find the H.C.F. and L.C.M. of polynomials. <b>NF</b></li> <li>• Quick review with students on the methods to find the H.C.F. and L.C.M. of two numbers.</li> <li>• Illustrate how to find the H.C.F. and L.C.M. of polynomials with examples.</li> </ul>	2.5	<p>Examples 5.22–5.25</p> <p>Teaching Examples 5.22 – 5.25</p> <p>Teaching Example (Extra) 5.25</p> <p><b>5-Minute Lecture:</b> H.C.F. and L.C.M. of Polynomials</p>	<p>Ex. 5E (p. 5.41)</p> <p>Level 1: 1 – 19</p> <p>Level 2: 20 – 31</p> <p>Rev. Ex. 5 (p. 5.55)</p> <p>Level 1: 21 – 24</p> <p>Level 2: 47 – 51</p>			
			<p><b>NF</b> 5.6 Rational Functions and their Manipulations</p> <p>A Multiplication and Division of Rational Functions</p> <p>B Addition and Subtraction of Rational Functions</p> <p>C Further Manipulations of Rational</p>	4.5	<p>Examples 5.26 – 5.32</p> <p>Teaching Examples 5.26 – 5.32</p> <p>Teaching Examples (Extra) 5.29, 5.32</p> <p><b>5-Minute Lecture:</b> Rational Functions and their Manipulations</p>	<p>Ex. 5F (p. 5.48)</p> <p>Level 1: 1 – 18</p> <p>Level 2: 19 – 36</p> <p>Rev. Ex. 5 (p. 5.55)</p> <p>Level 1: 25 – 30</p> <p>Level 2: 52 – 60</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>Functions</p> <ul style="list-style-type: none"> <li>• Learn the meaning of rational functions.</li> <li>• Learn how to perform addition, subtraction, multiplication and division of rational functions. NF</li> <li>• Help students revise the manipulation of simple algebraic fractions.</li> <li>• Illustrate the application of the factor theorem and other methods for factorizing polynomials in the manipulation of rational functions.</li> </ul>						
<b>Second Term</b> <b>(31/12/2017-</b> <b>18/7/2018,</b> <b>Weeks</b> <b>18-46)</b>	18-20	<b>Chapter 6 – Exponential Functions</b>	<p>6.1 Laws of Rational Indices</p> <p>A Radicals</p> <p>B Rational Indices</p> <ul style="list-style-type: none"> <li>• Understand the definitions of radicals and rational indices.</li> <li>• Understand and use the laws of rational indices.</li> <li>• Learn how to solve equations in the form <math>x^n = c</math>.</li> <li>• Help students revise the laws of integral indices learnt in junior forms using the <i>Basic Knowledge Review</i> on p. 6.3.</li> <li>• Teachers should introduce the concept of radicals and</li> </ul>	4	<p>Examples 6.1 – 6.4</p> <p>Teaching Examples 6.1 – 6.4</p> <p>Teaching Examples (Extra) 6.1, 6.3</p> <p><b>5-Minute Lecture:</b></p> <p>Laws of Rational Indices</p> <p><b>Drilling Program:</b></p> <p>Laws of Indices</p>	<p>Ex. 6A (p. 6.14)</p> <p>Level 1: 1 – 29</p> <p>Level 2: 30 – 53</p> <p>Rev. Ex. 6 (p. 6.36)</p> <p>Level 1: 1 – 15</p> <p>Level 2: 33 – 39</p> <p>Quiz 5 Ch.5</p>	<p>eLearning platform with instant feedback</p> <p>eWorksheet in eclass with solution</p>	1, 7, 9, 17	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			rational indices. <ul style="list-style-type: none"> <li>Teachers should ensure students understand that the laws of integral indices can be extended to rational indices.</li> <li>Illustrate how to apply the laws of indices to solve equations in the form <math>x^{\frac{m}{n}} = c</math> with examples.</li> </ul>						
			6.2 Exponential Equations <ul style="list-style-type: none"> <li>Learn how to solve exponential equations by using the laws of indices.</li> <li>Teachers should introduce the concept of exponential equations.</li> <li>Illustrate how to apply the laws of indices to solve exponential equations with examples.</li> </ul>	2	Examples 6.5 – 6.6 Teaching Examples 6.5 – 6.6 Teaching Examples (Extra) 6.5, 6.6 <b>5-Minute Lecture:</b> Exponential Equations	Ex. 6B (p. 6.18) Level 1: 1 – 14 Level 2: 15 – 27  Rev. Ex. 6 (p. 6.36) Level 1: 16 – 22 Level 2: 40 – 46			
			6.3 Exponential Functions and their Graphs A Exponential Functions B Graphs of Exponential Functions <ul style="list-style-type: none"> <li>Understand the exponential functions and their properties.</li> <li>Recognize the features of the graphs of exponential functions.</li> </ul>	4	Examples 6.7 – 6.9 Teaching Examples 6.7 – 6.9 <b>5-Minute Lecture:</b> Exponential Functions and their Graphs <b>IT Activity 6.1:</b> Features of the	Ex. 6C (p. 6.27) Level 1: 1 – 13 Level 2: 14 – 26  Rev. Ex. 6 (p. 6.36) Level 1: 23 – 32 Level 2: 47 – 55			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<ul style="list-style-type: none"> <li>Teachers should introduce the concept of exponential functions and their properties.</li> <li>Teachers may use <i>Activity 6.1</i> or <i>IT Activity 6.1</i> to let students explore the features of the graphs of exponential functions.</li> <li>Teachers may use a graph plotting software to demonstrate the relationship between the graphs of <math>y = a^x</math> and <math>y = \left(\frac{1}{a}\right)^x</math> for <math>a &gt; 1</math>.</li> <li>Illustrate how to solve problems related to exponential functions and their graphs with examples.</li> <li>Teachers may encourage students to attempt the <i>Investigation Corner</i> on p. 6.47.</li> </ul>		graphs of $y = a^x$ for $a > 1$ and $0 < a < 1$				
	20-22	<b>Chapter 7 – Logarithmic Functions</b>	7.1 Common Logarithms A Definition of Common Logarithms B Properties of Common Logarithms C Logarithmic Equations <ul style="list-style-type: none"> <li>Understand the definition of common logarithms.</li> <li>Learn the properties of</li> </ul>	5.5	Examples 7.1 – 7.8 Teaching Examples 7.1 – 7.8 Teaching Examples (Extra) 7.1, 7.3, 7.4, 7.7, 7.8 <b>5-Minute Lecture:</b> Common	Ex. 7A (p. 7.11) Level 1: 1 – 28 Level 2: 29 – 47 Ex. 7B (p. 7.16) Level 1: 1 – 19 Level 2: 20 – 37	eLearning platform with instant feedback eWorksheet in eclass with solution	1, 7, 9, 17	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>common logarithms.</p> <ul style="list-style-type: none"> <li>• Apply the properties of common logarithms to solve problems.</li> <li>• Solve logarithmic equations.</li> <li>• Solve exponential equations by converting them into logarithmic equations.</li> <li>• Teachers may use the <i>Warm-Up Activity</i> on p.7.3 to prepare students for learning the definition of common logarithms.</li> <li>• Teachers should introduce the definition of common logarithms.</li> <li>• Teachers may use <i>Activity 7.1</i> to let students explore the properties of common logarithms.</li> <li>• Teachers may derive the properties of common logarithms from the laws of indices.</li> <li>• Illustrate how to apply the properties of common logarithms to solve related problems with examples.</li> <li>• Teachers should introduce the concept of logarithmic equations.</li> <li>• Teachers may use <i>Maths</i></li> </ul>		<p>Logarithms</p> <p><b>Extra IT Activity:</b></p> <p>Properties of common logarithms</p> <p><b>5-Minute Lecture:</b></p> <p>Logarithmic Equations</p>	<p>Rev. Ex. 7 (p. 7.54)</p> <p>Level 1: 1, 3, 6, 8,10, 12, 14, 16,</p> <p>18 – 20</p> <p>Level 2: 30, 33, 35 – 36, 38, 40, 42, 44 – 47</p> <p>Quiz 6 Ch.6</p>			



School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p><i>Dialogue</i> on p.7.14 to clarify that log is not a common factor and cannot be simply crossed out.</p> <ul style="list-style-type: none"> <li>• Demonstrate how to apply the properties of common logarithms to solve exponential and logarithmic equations with examples.</li> </ul>						
			<p>7.2 Applications of Common Logarithms</p> <p>A Sound Intensity Level</p> <p>B Richter Scale</p> <p>C Logarithmic Transformation</p> <p>D Other Applications</p> <ul style="list-style-type: none"> <li>• Appreciate the applications of logarithms in real life situations such as measuring the sound intensity and the magnitude of an earthquake, logarithmic transformation and other applications.</li> <li>• Teachers should use various real life situations to illustrate the applications of common logarithms.</li> </ul>	2.5	<p>Examples 7.9 – 7.14</p> <p>Teaching Examples 7.9 – 7.14</p> <p>Teaching Examples (Extra) 7.10, 7.11, 7.14</p> <p><b>5-Minute Lecture:</b> Applications of Common Logarithms</p> <p><b>Video:</b> Applications of Logarithms</p> <p><b>Animation:</b> Logarithmic Transformation</p>	<p>Ex. 7C (p. 7.25)</p> <p>Level 1: 1 – 12</p> <p>Level 2: 13 – 22</p> <p>Rev. Ex. 7 (p. 7.54)</p> <p>Level 1: 21 – 23, 25 – 26</p> <p>Level 2: 51 – 54, 58</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>7.3 Logarithms to an Arbitrary Base</p> <p>A Definition of Logarithms to an Arbitrary Base</p> <p>B Properties of Logarithms to an Arbitrary Base</p> <p>C Logarithmic Equations</p> <ul style="list-style-type: none"> <li>• Understand the definition of logarithms to an arbitrary base.</li> <li>• Learn the properties of logarithms to an arbitrary base.</li> <li>• Apply the properties of logarithms to an arbitrary base to solve problems.</li> <li>• Solve logarithmic equations to an arbitrary base.</li> <li>• Teachers should emphasize that common logarithm is not the only type of logarithms. Its definition and properties can be extended to an arbitrary base <math>a</math>, where <math>a &gt; 0</math> and <math>a \neq 1</math>.</li> <li>• Teachers should introduce the</li> </ul>	2	<p>Examples 7.15 – 7.19</p> <p>Teaching Examples 7.15 – 7.19</p> <p>Teaching Example (Extra) 7.17</p> <p><b>5-Minute Lecture:</b> Logarithms to an Arbitrary Base</p>	<p>Ex. 7D (p. 7.35)</p> <p>Level 1: 1 – 27</p> <p>Level 2: 28 – 48</p> <p>Rev. Ex. 7 (p. 7.54)</p> <p>Level 1: 2, 4 – 5, 7, 9, 11, 13, 15, 17, 24</p> <p>Level 2: 29, 31 – 32, 34, 37, 39, 41, 43, 48 – 50</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			base-change formula of logarithms. <ul style="list-style-type: none"> <li>• Illustrate how to apply the properties of logarithms to solve related problems with examples.</li> </ul>						
			7.4 Graphs of Logarithmic Functions and their Features A The Graphs of $y = \log_a x$ where $a > 1$ B The Graphs of $y = \log_a x$ where $0 < a < 1$ C Relationship between Graphs of Exponential and Logarithmic Functions <ul style="list-style-type: none"> <li>• Understand the logarithmic functions and their properties.</li> <li>• Recognize the features of the graphs of logarithmic functions.</li> <li>• Understand the relationship between <math>y = ax</math> and <math>y = \log_a x</math>.</li> <li>• Teachers may use <i>Activity 7.2</i> or <i>IT Activity 7.1</i> to let students explore the features of the graphs of logarithmic functions.</li> </ul>	3	Example 7.20 Teaching Example 7.20 <b>5-Minute Lecture:</b> Graphs of Logarithmic Functions and their Features <b>IT Activity 7.1:</b> Features of the graphs of $y = \log_a x$ for $a > 1$ and $0 < a < 1$ <b>Extra IT Activity:</b> Relationship between the graphs of $y = a^x$ and $y = \log_a x$	Ex. 7E (p. 7.44) Level 1: 1 – 5 Level 2: 6 – 10  Rev. Ex. 7 (p. 7.54) Level 1: 27 – 28 Level 2: 55 – 57			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<ul style="list-style-type: none"> <li>Teachers should use the tabular and graphical representation of exponential functions and logarithmic functions to discuss their relationship.</li> <li>Teachers may use <i>Extra IT Activity</i> to demonstrate the relationship between the graphs of <math>y = a^x</math> and <math>y = \log_a x</math>.</li> </ul>						
			<p>7.5 Historical Development of the Concept of Logarithms</p> <p>A The Logarithm Tables</p> <p>B The Anti-logarithm Tables</p> <p>C The Slide Rule</p> <ul style="list-style-type: none"> <li>Appreciate the development of the concept of logarithms.</li> <li>Teachers can introduce the logarithm tables, the anti-logarithm tables and the slide rule.</li> </ul>	1			<b>5-Minute Lecture:</b> Historical Development of the Concept of Logarithms		
	23-26	<b>Chapter 8 – More about Equations</b>	<p>8.1 Solving Simultaneous Equations by the Algebraic Method</p> <ul style="list-style-type: none"> <li>Learn how to solve simultaneous equations, one linear and one quadratic, by the algebraic method.</li> </ul>	3.5	<p>Examples 8.1 – 8.6</p> <p>Teaching Examples 8.1 – 8.6</p> <p>Teaching Examples (Extra) 8.5, 8.6</p> <p><b>5-Minute Lecture:</b></p>	<p>Ex. 8A (p. 8.14)</p> <p>Level 1: 1 – 16</p> <p>Level 2: 17 – 29</p> <p>Rev. Ex. 8 (p. 8.43)</p>	eLearning platform with instant feedback eWorksheet in eclass	1, 7, 9, 17	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<ul style="list-style-type: none"> <li>• Learn how to solve practical problems involving simultaneous equations.</li> <li>• Help students revise the algebraic methods for solving simultaneous linear equations using the <i>Basic Knowledge Review</i> on p. 8.3.</li> <li>• Extend the idea to solve simultaneous equations, one linear and one quadratic, and illustrate with examples.</li> <li>• Teachers may use <i>Maths Dialogue</i> on p. 8.10 to let students compare different ways of solving simultaneous equations.</li> <li>• Illustrate how to solve practical problems involving simultaneous equations, one linear and one quadratic, with examples.</li> </ul>		Solving Simultaneous Equations by the Algebraic Method	Level 1: 1 – 3, 25 – 26 Level 2: 30 – 33, 52 – 54  Quiz 7 Ch.7	with solution		
			8.2 Solving Simultaneous Equations by the Graphical Method <ul style="list-style-type: none"> <li>• Learn how to solve simultaneous equations, one linear and one quadratic, by the graphical method.</li> <li>• Understand the use and the limitations of the graphical method in solving equations.</li> </ul>	4	Examples 8.7 – 8.10 Teaching Examples 8.7 – 8.10 Teaching Examples (Extra) 8.9, 8.10 <b>5-Minute Lecture:</b> Solving	Ex. 8B (p. 8.23) Level 1: 1 – 17 Level 2: 18 – 27  Rev. Ex. 8 (p. 8.43) Level 1: 4 – 12 Level 2: 34 – 39			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<ul style="list-style-type: none"> <li>• Learn how to use the discriminant to find the number of intersections between a straight line and a quadratic curve.</li> <li>• Help students revise the graphical method for solving simultaneous linear equations using the <i>Basic Knowledge Review</i> on p. 8.3.</li> <li>• Extend the idea to solve simultaneous equations, one linear and one quadratic and illustrate with examples.</li> <li>• Illustrate how the discriminant can be used to find the number of intersections between a straight line and a quadratic curve.</li> <li>• Teachers may encourage students to attempt the <i>Investigation Corner</i> on p. 8.54.</li> </ul>		Simultaneous Equations by the Graphical Method <b>Teaching Tool:</b> Solving Simultaneous Equations by the Graphical Method <b>IT Activity 8.1:</b> Explore the number of intersections between a straight line and a quadratic curve				
			8.3 Equations Reducible to Quadratic Equations A Fractional Equations B Equations of Higher Degree	4	Examples 8.11 – 8.20 Teaching Examples 8.11 – 8.20 Teaching Examples	Ex. 8C (p. 8.34) Level 1: 1 – 30 Level 2: 31 – 54 Rev. Ex. 8 (p.			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			C Equations with Square Root Signs D Exponential Equations E Logarithmic Equations <ul style="list-style-type: none"> <li>• Solve equations (including fractional equations, equations of higher degree, equations with square root signs, exponential equations and logarithmic equations) which can be reduced to quadratic equations.</li> <li>• Help students revise the techniques of solving quadratic equations, exponential equations and logarithmic equations using the <i>Basic Knowledge Review</i> on p. 8.4 – 8.6.</li> <li>• Illustrate the techniques of solving an equation by reducing it into a quadratic equation, with examples.</li> <li>• Remind students to check the validity of the answers obtained.</li> </ul>		(Extra) 8.11 – 8.13, 8.19, 8.20 <b>5-Minute Lecture:</b> Equations Reducible to Quadratic Equations	8.43) Level 1: 13 – 24 Level 2: 40 – 51			
			8.4 Practical Problems Leading to Quadratic Equations <ul style="list-style-type: none"> <li>• Solve practical problems involving equations which</li> </ul>	3	<b>5-Minute Lecture:</b> Practical Problems Leading to	Ex. 8D (p. 8.38) Level 1: 1 – 10 Level 2: 11 – 16			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>can be reduced to quadratic equations.</p> <ul style="list-style-type: none"> <li>Teachers may tell students that summarizing the given information using tables help understand the problem and formulate an equation.</li> </ul>		Quadratic Equations	Rev. Ex. 8 (p. 8.43) Level 1: 27 – 29 Level 2: 55 – 58			
	27-28	<b>Chapter 9 – Variations</b>	9.1 Basic Concept of Variation <ul style="list-style-type: none"> <li>Understand the basic concept of variation through daily life examples.</li> <li>Teachers should help students revise the concepts of rate and ratio using the <i>Basic Knowledge Review</i> on p. 9.3.</li> <li>Teachers may ask students to give more examples of variations in daily life.</li> </ul>	0.5		Quiz 8 Ch.8	eLearning platform with instant feedback eWorksheet in eclass with solution	1, 7, 9, 17	
			9.2 Direct Variation <ul style="list-style-type: none"> <li>Understand the concept of direct variation.</li> <li>Explore the algebraic and graphical representations of two quantities in direct variation.</li> <li>Learn how to solve real life problems involving direct variation.</li> <li>Teachers should introduce the concept of direct variation.</li> </ul>	3	Examples 9.1 – 9.5 Teaching Examples 9.1 – 9.5 Teaching Example (Extra) 9.4 <b>5-Minute Lecture:</b> Direct Variation	Ex. 9A (p. 9.15) Level 1: 1 – 16 Level 2: 17 – 28 Rev. Ex. 9 (p. 9.61) Level 1: 2, 9, 14, 17, 20 – 21, 26			



School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<ul style="list-style-type: none"> <li>• Teachers may give some real life examples of direct variation to consolidate students' understanding.</li> <li>• Teachers may use <i>Activity 9.1</i> to let students learn the concept of direct variation and its graph.</li> <li>• Illustrate how to set up an equation connecting the quantities in a direct variation and how to find the value of a quantity/an unknown in a direct variation.</li> <li>• Make sure students know that the graph of <math>y = kx</math> is a straight line passing through the origin with slope <math>k</math>.</li> <li>• Help students revise percentage using the <i>Basic Knowledge Review</i> on p. 9.4.</li> <li>• Illustrate how to find the percentage change of one quantity when the other quantity in a direct variation changes.</li> <li>• Illustrate how to solve real life problems involving direct variation.</li> <li>• Teachers may discuss with students some ambiguities about direct variation using</li> </ul>			Level 2: 41, 53			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			the <i>Maths Dialogue</i> on p. 9.14.						
			<p>9.3 Inverse Variation</p> <ul style="list-style-type: none"> <li>• Understand the concept of inverse variation.</li> <li>• Explore the algebraic and graphical representations of two quantities in inverse variation.</li> <li>• Learn how to solve real life problems involving inverse variation.</li> <li>• Teachers should introduce the concept of inverse variation.</li> <li>• Teachers may give some real life examples of inverse variation to consolidate students' understanding.</li> <li>• Teachers may use <i>Activity 9.2</i> to let students learn the concept of inverse variation and its graph.</li> <li>• Illustrate how to set up an equation connecting the quantities in an inverse variation and how to find the value of a quantity/an unknown in an inverse variation.</li> <li>• Make sure students know that the graph of <math>y = \frac{k}{x}</math> is a curve which does not pass through</li> </ul>	3	<p>Examples 9.6 – 9.10</p> <p>Teaching Examples 9.6 – 9.10</p> <p>Teaching Example (Extra) 9.7</p> <p><b>5-Minute Lecture:</b> Inverse Variation</p>	<p>Ex. 9B (p. 9.27)</p> <p>Level 1: 1 – 13</p> <p>Level 2: 14 – 29</p> <p>Rev. Ex. 9 (p. 9.61)</p> <p>Level 1: 1, 3, 8, 10, 13, 18, 22, 24, 27, 32</p> <p>Level 2: 35</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>the origin.</p> <ul style="list-style-type: none"> <li>• Illustrate how to find the percentage change of one quantity when the other quantity in an inverse variation changes.</li> <li>• Illustrate how to solve real life problems involving inverse variation.</li> </ul>						
			<p>9.4 Joint Variation</p> <ul style="list-style-type: none"> <li>• Understand the concept of joint variation.</li> <li>• Learn how to solve real life problems involving joint variation.</li> <li>• Teachers should introduce the concept of joint variation.</li> <li>• Teachers should give examples of different forms of joint variation.</li> <li>• Illustrate how to set up an equation connecting the quantities in a joint variation and how to find the value of a quantity/an unknown in a joint variation.</li> <li>• Illustrate how to find the percentage change of one quantity when the other quantities in a joint variation change.</li> <li>• Illustrate how to solve real</li> </ul>	3.5	<p>Examples 9.11 – 9.15</p> <p>Teaching Examples 9.11 – 9.15</p> <p>Teaching Example (Extra) 9.14</p> <p><b>5-Minute Lecture:</b> Joint Variation</p>	<p>Ex. 9C (p. 9.38)</p> <p>Level 1: 1 – 17</p> <p>Level 2: 18 – 29</p> <p>Rev. Ex. 9 (p. 9.61)</p> <p>Level 1: 4 – 5, 11, 15 – 16, 23, 28 – 29</p> <p>Level 2: 36 – 38, 44</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			life problems involving joint variation.						
			<p>9.5 Partial Variation</p> <ul style="list-style-type: none"> <li>• Understand the concept of partial variation.</li> <li>• Learn how to solve real life problems involving partial variation.</li> <li>• Teachers should introduce the concept of partial variation.</li> <li>• Teachers may use <i>Activity 9.3</i> to let students understand the nature of partial variation through real life examples.</li> <li>• Teachers should give examples of different forms of partial variation.</li> <li>• Illustrate how to set up an equation connecting the quantities in a partial variation and how to find the value of a quantity/an unknown in a partial variation.</li> <li>• Illustrate how to find the variation constants by setting up a pair of simultaneous linear equations.</li> <li>• Illustrate how to solve real life problems involving partial variation.</li> </ul>	3.5	<p>Examples 9.16 – 9.20</p> <p>Teaching Examples 9.16 – 9.20</p> <p>Teaching Example (Extra) 9.19</p> <p><b>5-Minute Lecture:</b> Partial Variation</p>	<p>Ex. 9D (p. 9.51)</p> <p>Level 1: 1 – 17</p> <p>Level 2: 18 – 30</p> <p>Rev. Ex. 9 (p. 9.61)</p> <p>Level 1: 6 – 7, 12, 19, 25, 30 – 31, 33 – 34</p> <p>Level 2: 39 – 40, 42 – 43, 45 – 52</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
	32-33	<b>Chapter 10 – More about Trigonometry</b>	10.1 Angles of Rotation A Angles of Rotation B The Four Quadrants <ul style="list-style-type: none"> <li>• Understand the definitions of angle of rotation and quadrant.</li> <li>• Recognize the concepts of angles with the same terminal side on a rectangular coordinate plane.</li> <li>• Help students revise the basic definitions of trigonometric ratios using the <i>Basic Knowledge Review</i> on p. 10.3.</li> <li>• Teachers should introduce the concepts of angle of rotation, quadrants and angles with the same terminal side on the rectangular coordinate plane.</li> </ul>	1	<b>5-Minute Lecture:</b> Angles of Rotation	Quiz 9 Ch.9	eLearning platform with instant feedback eWorksheet in eclass with solution	1, 7, 9, 17	
			10.2 Trigonometric Ratios of Any Angle A Definitions of Trigonometric Ratios of Any Angle B The Signs of Trigonometric Ratios <ul style="list-style-type: none"> <li>• Understand the definitions of trigonometric ratios, including sine ratio, cosine ratio and</li> </ul>	2	Examples 10.1 – 10.4 Teaching Examples 10.1 – 10.4 Teaching Example (Extra) 10.4 <b>5-Minute Lecture:</b> Trigonometric Ratios of Any	Ex. 10A (p. 10.19) Level 1: 1 – 18 Level 2: 19 – 36 Rev. Ex. 10 (p. 10.65) Level 1: 1 – 8 Level 2: 24 – 27			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>tangent ratio, of any angle.</p> <ul style="list-style-type: none"> <li>• Recognize the values of trigonometric ratios of <math>0^\circ</math>, <math>90^\circ</math>, <math>180^\circ</math>, <math>270^\circ</math> and <math>360^\circ</math>.</li> <li>• Understand the signs of trigonometric ratios in different quadrants and the ‘CAST’ diagram.</li> <li>• Teachers should introduce the definitions of trigonometric ratios of an arbitrary angle.</li> <li>• Teachers may use <i>Warm-Up Activity</i> to let students realize that the coordinates of <math>P</math> is related to the angle of rotation before learning the definitions of trigonometric ratio of any angle.</li> <li>• Teachers may use <i>Activity 10.1</i> (or <i>IT Activity</i> on p. 10.80) to let students explore the signs of trigonometric ratios of angles in different quadrants.</li> <li>• Teachers should introduce the ‘CAST’ diagram.</li> <li>• Illustrate how to find the values of the trigonometric ratios of angles in different quadrants with examples.</li> <li>• Teachers may use <i>Maths Dialogue</i> on p. 10.17 to help</li> </ul>		<p>Angle</p> <p><b>IT Activity 10.1:</b></p> <p>The signs of trigonometric ratios</p>				

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			students understand the concept and fully master how to determine the signs of $x$ , $y$ and $r$ when a condition is given.						
			<p>10.3 Graphs of Trigonometric Functions</p> <p>A Graph of <math>y = \sin \theta</math></p> <p>B Graph of <math>y = \cos \theta</math></p> <p>C Graph of <math>y = \tan \theta</math></p> <p>D Periodicity of Trigonometric Functions</p> <ul style="list-style-type: none"> <li>• Understand the features of graphs of sine, cosine and tangent functions.</li> <li>• From the graphs of the trigonometric functions, recognize their features including periodicity and optimum values.</li> <li>• Teachers may use <i>Activity 10.2</i> to let students explore the properties of sine function, such as the maximum and minimum values, the signs in different quadrants, by considering the graph of <math>y = \sin \theta</math>.</li> <li>• Teachers should discuss with</li> </ul>	3.5	<p>Examples 10.5 – 10.8</p> <p>Teaching Examples 10.5 – 10.8</p> <p>Teaching Example (Extra) 10.8</p> <p><b>5-Minute Lecture:</b> Graphs of Trigonometric Functions</p> <p><b>IT Activity 10.2:</b> Plot the graph of <math>y = \sin \theta</math> by using the unit circle</p> <p><b>Extra IT Activity:</b> Plot graphs of trigonometric functions by using the unit circle</p> <p><b>Animation:</b> Periodicity of</p>	<p>Ex. 10B (p. 10.34)</p> <p>Level 1: 1 – 12</p> <p>Level 2: 13 – 22</p> <p>Rev. Ex. 10 (p. 10.65)</p> <p>Level 1: 9 – 11</p> <p>Level 2: 31 – 33, 37 – 38</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>students the periodicity of trigonometric functions using their graphs.</p> <ul style="list-style-type: none"> <li>• Teachers may use <i>To Learn More</i> on p. 10.29 or <i>IT Activity 10.2</i> on p. 10.81 to let students plot the graph of <math>y = \sin \theta</math> by using the unit circle.</li> <li>• Illustrate how to find the optimum values of trigonometric functions algebraically.</li> </ul>		Trigonometric Functions				
			<p>10.4 Graphical Solutions of Trigonometric Equations</p> <ul style="list-style-type: none"> <li>• Learn how to solve trigonometric equations such as <math>\sin x = k</math> graphically, where <math>k</math> is a constant.</li> <li>• Illustrate the steps in solving trigonometric equations graphically with examples.</li> </ul>	1.5	<p>Examples 10.9 – 10.10</p> <p>Teaching Examples 10.9 – 10.10</p> <p><b>5-Minute Lecture:</b></p> <p>Graphical Solutions of Trigonometric Equations</p>	<p>Ex. 10C (p. 10.39)</p> <p>Level 1: 1 – 5</p> <p>Level 2: 6 – 10</p> <p>Rev. Ex. 10 (p. 10.65)</p> <p>Level 1: 12 – 15</p> <p>Level 2: 34 – 36</p>			
			<p>10.5 Trigonometric Identities</p> <p>A Trigonometric Ratios of <math>(180^\circ - \theta)</math></p> <p>B Trigonometric Ratios of <math>(180^\circ + \theta)</math></p> <p>C Trigonometric Ratios of <math>(360^\circ - \theta)</math> &amp; <math>-\theta</math></p>	3	<p>Examples 10.11 – 10.15</p> <p>Teaching Examples 10.11 – 10.15</p> <p>Teaching Example (Extra) 10.14</p> <p><b>Drilling Program:</b></p>	<p>Ex. 10D (p. 10.51)</p> <p>Level 1: 1 – 16</p> <p>Level 2: 17 – 32</p> <p>Rev. Ex. 10 (p. 10.65)</p>			



School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>D Trigonometric Ratios of <math>(360^\circ + \theta)</math></p> <p>E Trigonometric Ratios of <math>(90^\circ + \theta)</math></p> <p>F Trigonometric Ratios of <math>(270^\circ - \theta)</math> and <math>(270^\circ + \theta)</math></p> <ul style="list-style-type: none"> <li>• Learn the trigonometric identities for trigonometric ratios of <math>(180^\circ \pm \theta)</math>, <math>(360^\circ \pm \theta)</math>, <math>-\theta</math>, <math>(90^\circ + \theta)</math> and <math>(270^\circ \pm \theta)</math>.</li> <li>• Learn to simplify trigonometric expressions and prove trigonometric identities.</li> <li>• Teachers may use <i>Activity 10.3</i> to let students explore the relationships between the trigonometric ratios of <math>\theta</math> and <math>(180^\circ - \theta)</math>.</li> <li>• Teachers should encourage students to make use of the 'CAST' diagram to memorize the trigonometric identities.</li> <li>• Illustrate the use of trigonometric identities to simplify trigonometric expression and prove other trigonometric identities with examples.</li> </ul>		<p>Trigonometric Identities</p> <p><b>5-Minute Lecture:</b></p> <p>Trigonometric Identities</p> <p><b>Extra IT Activity:</b></p> <p>Trigonometric identities</p>	<p>Level 1: 16 – 20</p> <p>Level 2: 28 – 30, 39 – 43</p>			

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			10.6 Solving Trigonometric Equations by Algebraic Methods <ul style="list-style-type: none"> <li>• Learn how to solve various trigonometric equations algebraically.</li> <li>• Illustrate how to solve trigonometric equations by algebraic methods with examples.</li> </ul>	2	Examples 10.16 – 10.20 Teaching Examples 10.16 – 10.20 Teaching Examples (Extra) 10.16, 10.18, 10.20 <b>5-Minute Lecture:</b> Solving Trigonometric Equations by Algebraic Methods	Ex. 10E (p. 10.58) Level 1: 1 – 15 Level 2: 16 – 38 Rev. Ex. 10 (p. 10.65) Level 1: 21 – 23 Level 2: 44 – 49			
	34-36	<b>Book 5A Chapter 1 – Basic Properties of Circles</b>	1.1 Basic Terms of a Circle <ul style="list-style-type: none"> <li>A Arcs and Chords</li> <li>B Sectors and Segments</li> <li>C Special Types of Circles</li> </ul> <ul style="list-style-type: none"> <li>• Understand the basic terminologies related to a circle.</li> <li>• Help students revise the properties of angles related to lines and rectilinear figures learnt in junior forms using the <i>Basic Knowledge Review</i> on p. 1.3.</li> <li>• Teachers should remind students that an arc is a curve while a chord is a line</li> </ul>	1.5	<b>5-Minute Lecture:</b> Basic Terms of a Circle	Quiz 10 Ch.10	eLearning platform with instant feedback eWorksheet in eclass with solution	1, 7, 9, 17	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>segment.</p> <ul style="list-style-type: none"> <li>• Teachers should ensure students note the difference between sectors and segments.</li> <li>• Teachers should guide students to distinguish the terms 'inscribed' and 'circumscribed'.</li> </ul>						
			<p>1.2 Chords of a Circle</p> <p>A Perpendiculars to Chords</p> <p>B Distances between Chords and Centre</p> <ul style="list-style-type: none"> <li>• Understand the basic properties of chords of a circle.</li> <li>• Learn to apply the basic properties of chords of a circle to solve related geometric problems.</li> <li>• Teachers may use <i>Activity 1.1</i> to let students explore and prove the properties of perpendicular from the centre of a circle to a chord.</li> <li>• Teachers may use <i>Extra IT Activity</i> to let students explore the relationships between chords and their distances from centre.</li> </ul>	4.5	<p>Examples 1.1 – 1.5</p> <p>Teaching Examples 1.1 – 1.5</p> <p>Teaching Example (Extra) 1.2</p> <p><b>5-Minute Lecture:</b> Chords of a Circle</p> <p><b>Teaching Tool:</b> Perpendiculars to Chords</p> <p><b>Extra IT Activity:</b> Relationships between chords and their distances from centre</p>	<p>Ex. 1A (p. 1.21)</p> <p>Level 1: 1 – 17</p> <p>Level 2: 18 – 31</p> <p>Rev. Ex. 1 (p. 1.76)</p> <p>Level 1: 1, 7, 16</p> <p>Level 2: 21 – 22</p>			

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			<ul style="list-style-type: none"> <li>• For abler students, teachers may show them the proofs of the theorems taught in this chapter.</li> <li>• Make sure students can determine when to use a theorem and when to use its converse.</li> <li>• Illustrate the uses of theorems 1.1 – 1.5 with examples.</li> <li>• Teachers are reminded that performing geometric proofs using the properties of circles belongs to Non-Foundation Topics of the syllabus.</li> </ul>						
			<p>1.3 Angles in a Circle</p> <p>A Angles at the Centre and Angles at the Circumference</p> <p>B Angles in the Same Segment</p> <ul style="list-style-type: none"> <li>• Understand the angle properties of a circle.</li> <li>• Learn to apply the angle properties of a circle to solve related geometric problems.</li> <li>• Teachers should emphasize that the angle at the centre subtended by a certain arc maybe a reflex angle.</li> <li>• Teachers may use <i>IT Activity</i></li> </ul>	4.5	<p>Examples 1.6 – 1.11</p> <p>Teaching Examples 1.6 – 1.11</p> <p><b>5-Minute Lecture:</b> Angles in a Circle</p> <p><b>IT Activity 1.1:</b> Relationship between angles in a circle</p> <p><b>Teaching Tool:</b> Angles in the Same Segment</p>	<p>Ex. 1B (p. 1.36)</p> <p>Level 1: 1 – 15</p> <p>Level 2: 16 – 28</p> <p>Rev. Ex. 1 (p. 1.76)</p> <p>Level 1: 2, 4, 9, 11 – 12, 14 – 15, 17</p> <p>Level 2: 23 – 24</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>1.1 on p. 1.91 to let students investigate the relationship between angle at centre and angle at circumference.</p> <ul style="list-style-type: none"> <li>• Teachers may illustrate the concept of <math>\angle</math> in semi-circle by using the concept of <math>\angle</math> at centre twice <math>\angle</math> at <math>\odot^{ce}</math>.</li> <li>• Make sure students can identify angles in the same segment.</li> </ul>						
			<p>1.4 Relationships among Arcs, Chords and Angles</p> <p>A Equal Arcs, Equal Chords and Equal Angles</p> <p>B Arcs Proportional to Angles at the Centre</p> <ul style="list-style-type: none"> <li>• Understand the relationships among arcs, chords and angles.</li> <li>• Learn to apply the relationships among arcs, chords and angles to solve related geometric problems.</li> <li>• Teachers should introduce the relationships among arcs, chords and angles of circles.</li> <li>• Teachers may use <i>Extra IT Activity</i> to let students explore</li> </ul>	3	<p>Examples 1.12 – 1.16</p> <p>Teaching Examples 1.12 – 1.16</p> <p><b>5-Minute Lecture:</b> Relationships among Arcs, Chords and Angles</p> <p><b>Extra IT Activity:</b> Relationships among arcs, chords and angles</p>	<p>Ex. 1C (p. 1.49)</p> <p>Level 1: 1 – 12</p> <p>Level 2: 13 – 23</p> <p>Rev. Ex. 1 (p. 1.76)</p> <p>Level 1: 3</p> <p>Level 2: 28 – 29, 33</p>			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			the relationships among arcs, chords and angles. • Illustrate the uses of theorems 1.10 – 1.17 with examples.						
			1.5 Cyclic Quadrilaterals • Understand the basic properties of cyclic quadrilaterals. • Learn to apply the basic properties of cyclic quadrilaterals to solve related geometric problems. • Teachers should introduce the definition of cyclic quadrilaterals. • Teachers may use <i>Activity 1.3</i> or <i>IT Activity 1.2</i> on p. 1.92 to let students investigate the relationship between a pair of opposite angles of a cyclic quadrilateral. • Make sure students can identify the exterior angles of a cyclic quadrilateral. • Illustrate the uses of theorems 1.18 – 1.19 with examples.	4.5	Examples 1.17 – 1.19 Teaching Examples 1.17 – 1.19 Teaching Example (Extra) 1.17 <b>5-Minute Lecture:</b> Cyclic Quadrilaterals <b>IT Activity 1.2:</b> Relationship between a pair of opposite angles of a cyclic quadrilateral	Ex. 1D (p. 1.56) Level 1: 1 – 10 Level 2: 11 – 21  Rev. Ex. 1 (p. 1.76) Level 1: 5 – 6, 10, 13 Level 2: 25 – 27, 30 – 32, 36 – 37, 39, 41			
			<b>NF</b> 1.6 Concyclic Points A Definition B Circle Passing through Three Non-collinear Points	4.5	Examples 1.20 – 1.22 Teaching Examples 1.20 – 1.22 Teaching Example	p. 1.61 Ex. 1E (p. 1.67) Level 1: 1 – 14 Level 2: 15 – 22			

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>C Tests for Concylic Points</p> <ul style="list-style-type: none"> <li>• Understand the definition of concyclic points.</li> <li>• Learn to test for concyclic points.</li> <li>• Teachers should introduce the definition of concyclic points.</li> <li>• Teachers may use <i>Activity 1.4</i> or <i>IT Activity 1.3</i> on p. 1.93 to let students learn how to construct the circumcircle of a triangle and learn that any three non-collinear points are concyclic.</li> <li>• Teachers may use <i>To Learn More</i> on p. 1.62 to explain why there is one and only one circle passing through three given non-collinear points.</li> <li>• Illustrate the uses of theorems 1.21 – 1.23 with examples.</li> </ul>		<p>(Extra) 1.22</p> <p><b>5-Minute Lecture:</b> Concyclic Points</p> <p><b>IT Activity 1.3:</b> Draw the circumcircle of a triangle</p> <p><b>Teaching Tool:</b> Tests for Concyclic Points</p>	<p>Rev. Ex. 1 (p. 1.76)</p> <p>Level 1: 18 – 20</p> <p>Level 2: 34 – 35, 38, 40, 42</p>			
	37-39	<b>Book 5A Chapter 2 – Tangents to Circles</b>	<p>2.1 Tangents to a Circle and their Properties</p> <p>A Definition</p> <p>B Radii and Tangents</p> <ul style="list-style-type: none"> <li>• Understand and apply the basic properties of tangents to a circle.</li> <li>• Teachers should introduce the definition of tangent.</li> </ul>	4.5	<p>Examples 2.1 – 2.5</p> <p>Teaching Examples 2.1 – 2.5</p> <p><b>5-Minute Lecture:</b> Tangents to a Circle and their Properties</p> <p><b>IT Activity 2.1:</b></p>	<p>Ex. 2A (p. 2.11)</p> <p>Level 1: 1 – 19</p> <p>Level 2: 20 – 29</p> <p>Rev. Ex. 2 (p. 2.43)</p> <p>Level 1: 1, 6, 8,</p>	eLearning platform with instant feedback eWorksheet in eclass with solution	1, 7, 9, 17	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<ul style="list-style-type: none"> <li>• Make sure students know that for any point on a circle, there is only one tangent passing through it.</li> <li>• Teachers may use <i>Activity 2.1</i> or <i>IT Activity 2.1</i> on p. 2.58 to let students explore the relationship between the radius of a circle and the tangent.</li> <li>• For abler students, teachers may show them the proofs of the theorems taught in this chapter.</li> <li>• Make sure students can determine when to use a theorem and when to use its converse.</li> <li>• Illustrate the uses of theorems 2.1 – 2.3 with examples.</li> <li>• Teachers may use <i>To Learn More</i> on p. 2.9 to show that when two circles touch each other, the point of contact and the two centres are collinear.</li> </ul>		Radius and tangent	12, 19 – 20 Level 2: 25, 29 – 31, 36, 38  Quiz 11 Ch.1			
			<p>2.2 Tangents from an External Point</p> <ul style="list-style-type: none"> <li>• Understand and apply the properties of tangents from an external point to a circle.</li> <li>• Teachers may use <i>Extra IT Activity</i> to let students explore</li> </ul>	3	Examples 2.6 – 2.8 Teaching Examples 2.6 – 2.8 Teaching Example (Extra) 2.8 <b>5-Minute Lecture:</b>	Ex. 2B (p. 2.20) Level 1: 1 – 15 Level 2: 16 – 26  Rev. Ex. 2 (p. 2.43)			



School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Self-directed Learning Skills <sup>♦</sup>	Values <sup>#</sup>	Basic Law Education
			<p>the properties of tangents from an external point.</p> <ul style="list-style-type: none"> <li>• Illustrate the uses of theorem 2.4 with examples.</li> <li>• Teachers may encourage students to attempt the Investigation Corner on p. 2.57.</li> </ul>		<p>Tangents from an External Point</p> <p><b>Extra IT Activity:</b> Tangent properties</p>	<p>Level 1: 5, 7, 14, 16 – 17, 20</p> <p>Level 2: 24, 28, 32</p>			
			<p>2.3 Angles in the Alternate Segment</p> <ul style="list-style-type: none"> <li>• Understand and apply the properties of angles in the alternate segment of a circle.</li> <li>• Teachers should introduce the definitions of tangent-chord angles and alternate segment.</li> <li>• Make sure students can identify angles in the alternate segment.</li> <li>• Teachers may use <i>Activity 2.2</i> to let students explore the relationship between tangent-chord angle and the corresponding angle in the alternate segment.</li> <li>• Illustrate the uses of theorems 2.5 – 2.6 with examples.</li> <li>• Teachers may use Maths Dialogue on p. 2.33 to let students prove tangency by different methods.</li> </ul>	4.5	<p>Examples 2.9 – 2.11</p> <p>Teaching Examples 2.9 – 2.11</p> <p>Teaching Examples (Extra) 2.10, 2.11</p> <p><b>5-Minute Lecture:</b> Angles in the Alternate Segment</p> <p><b>Teaching Tool:</b> Angles in the Alternate Segment</p>	<p>Ex. 2C (p. 2.34)</p> <p>Level 1: 1 – 16</p> <p>Level 2: 17 – 28</p> <p>Rev. Ex. 2 (p. 2.43)</p> <p>Level 1: 2 – 4, 9 – 11, 13, 15, 18, 21</p> <p>Level 2: 22 – 23, 26 – 27, 33 – 35, 37</p> <p>Quiz 12 Ch.12</p>			

\* The extended parts should be marked with asterisks. These parts should be more challenging and can be covered when the students can master the

knowledge and skills covered in the conventional topics.

# **Core Values of Wah Yan College, Kowloon**

I. Love and care	1. Accept & feel positive about himself 2. Appreciation & Gratitude 3. Empathy & Compassion	4. Forgiveness & Reconciliation 5. Service 6. Family as a basic unit of society; marriage is the foundation of a family
II. Strive for excellence	7. Reflective 8. Commitment 9. Perseverance	10. Curiosity & willingness to learn 11. Value imagination and creativity
III. Respect and Justice	12. Life is valuable and respectable 13. Openness to good in all things 14. Respect for himself & others	15. Integrity 16. Faithfulness
IV. Responsibility	17. Freedom & Self-discipline 18. Care for the environment	19. Social Identities: citizen identity, national identity and global citizen identity
V. Faith	20. Experience of God 21. Explore & practise one's faith	22. Appreciate religious liturgies