

Wah Yan College Kowloon
F.4 Mathematics Scheme of Work (2016-2017)

Textbook	1. New Horizon Senior Mathematics 4A (Compulsory Part) (2nd Edition) 2. New Horizon Senior Mathematics 4B (Compulsory Part) (2nd Edition) 3. New Horizon Senior Mathematics 5A (Compulsory Part) (2nd Edition)
Other Resources	

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	Values#
First Term (1/9/2016- 1/2/2017, Weeks 1 to 17)	1-4	Chapter 3 Quadratic Equations in One Unknown <ul style="list-style-type: none"> • To recognize the general form of a quadratic equation • To understand the factor method for solving quadratic equations • To use the quadratic formula to solve quadratic equations • To use the graphical method to solve quadratic equations • To apply different methods to solve practical problems involving quadratic equations 	Concept Review (pp.3.4 – 3.6) <ul style="list-style-type: none"> • Teachers can ask students to review the operation of polynomials. • Teachers can ask students to review the factorization of quadratic polynomials. • Teachers can ask students to review complex numbers. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> • Bridging Materials 	<ul style="list-style-type: none"> • Review Worksheet • Test Bank 3.0 	
				3.1 Quadratic Equations	1 hour		<ul style="list-style-type: none"> • Worksheet 3.1

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			and Roots (pp.3.7 – 3.8) <ul style="list-style-type: none"> The general form of quadratic equation is $ax^2 + bx + c = 0$, where $a \neq 0$. 	/1 hour		(Sets 1 & 2)	
			3.2 Solving Quadratic Equations by Factor Method (pp.3.8 – 3.14) <ul style="list-style-type: none"> Teachers may apply factorization in solving quadratic equations. 	1.5 hours /1.5 hours	<ul style="list-style-type: none"> PowerPoint <u>Inspiring Activity 3.1</u> (p.3.8) 	<ul style="list-style-type: none"> Worksheet 3.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 3.2 Test Bank 3.2 	
			3.3 Solving Quadratic Equations by Quadratic Formula (pp.3.15 – 3.22) <ul style="list-style-type: none"> Teachers may discuss with students the limitation of the factor method for solving quadratic equations through the Inspiring Activity 3.2. Teachers can point out that the quadratic formula 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint Web Exploring <u>Inspiring Activity 3.2</u> (p.3.15) 	<ul style="list-style-type: none"> Worksheet 3.3 (Sets 1 & 2) Ongoing Assessment Package: Quiz 3.3 Test Bank 3.3 	

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			<p>is derived from the method of completing the square.</p> <ul style="list-style-type: none"> Teachers may point out that a quadratic equation can have unreal roots when it has no real roots. Teachers may ask students to tell the difference between the methods of solving quadratic equation. 				
			<p>3.4 Solving Quadratic Equations by the Graphical Method (pp.3.22 – 3.31)</p> <ul style="list-style-type: none"> Teachers should remind students the approximate nature of solving equations graphically. 	<p>2 hours /2 hours</p>	<ul style="list-style-type: none"> PowerPoint Simulation (Graphical method to solve quadratic equations) 	<ul style="list-style-type: none"> Worksheet 3.4 (Sets 1 & 2) Ongoing Assessment Package: Quiz 3.4 Test Bank 3.4 	
			<p>3.5 Practical Problems Leading to Quadratic Equations (pp.3.32 – 3.37)</p> <ul style="list-style-type: none"> Strategy in setting up the 	<p>2 hours /2 hours</p>	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 3.5 (Sets 1 & 2) Ongoing Assessment Package: Quiz 	

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			required equations of word problems should be introduced.			3.5 • Test Bank 3.5	
			<p>Inquiry & Investigation – Solving a Quadratic Equation by a Geometrical Method (pp.3.48 – 3.49)</p> <ul style="list-style-type: none"> This Inquiry & Investigation introduces how to solve a quadratic equation by geometrical method. Teachers can discuss with students the limitations of this method. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Intensive Practice Open-ended Questions Ongoing Assessment Package: Formative Assessment 3 Test Bank (Multiple-choice Questions) 		
	5-8	<p>Chapter 4</p> <p>Roots and Coefficients of Quadratic Equations</p> <ul style="list-style-type: none"> To understand and apply the concept of discriminant in order to determine the nature of roots of quadratic equations <p>Non-foundation</p>	<p>Concept Review (pp.4.4 – 4.6)</p> <ul style="list-style-type: none"> Teachers can ask students the properties and how to solve linear inequalities in one unknown. Teachers can ask students to review the method in solving quadratic 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Bridging Materials 	<ul style="list-style-type: none"> Review Worksheet Test Bank 4.0 	

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		<ul style="list-style-type: none"> To understand the relations between the roots and coefficients To form quadratic equations with given roots <p>Non-foundation</p> <ul style="list-style-type: none"> To form quadratic equations by the sum of roots and the product of roots 	equations.				
			<p>4.1 The Nature of Roots of Quadratic Equations (pp.4.7 – 4.18)</p> <ul style="list-style-type: none"> The discriminant of a quadratic equation is derived from the quadratic formula. By substituting different values of a, b and c, we can know the nature of the roots from the value of the discriminant. Teachers can guide students to link up the concept in this section and the features of quadratic 	3 hours /3 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 4.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 4.1 Test Bank 4.1 	

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			graphs learnt in chapter 3 to explore the relationship between the discriminant and the number of x -intercepts of a quadratic graph.				
			<p>Non-foundation</p> <p>4.2 Sum and Product of Roots of Quadratic Equations (pp.4.19 – 4.28)</p> <ul style="list-style-type: none"> Teachers can introduce the formulas of the sum and product of roots. 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 4.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 4.2 Test Bank 4.2 	
			<p>4.3 Forming Quadratic Equations (pp.4.28 – 4.33)</p> <ul style="list-style-type: none"> Teachers can introduce how to form quadratic equations by using given roots. <p>Non-foundation</p> <ul style="list-style-type: none"> Teachers can introduce how to form quadratic equations by using the 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 4.3 (Sets 1 & 2) Ongoing Assessment Package: Quiz 4.3 Test Bank 4.3 	

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			relations between roots and coefficients.				
			<p>Inquiry & Investigation – The Quadratic Formula and Vieta’s Formulas (pp.4.44 – 4.45)</p> <ul style="list-style-type: none"> This Inquiry & Investigation introduces the proof of the quadratic formula by Vieta’s formulas and explores the Vieta’s formulas for cubic equations. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Intensive Practice Open-ended Questions Ongoing Assessment Package: Formative Assessment 4 Test Bank (Multiple-choice Questions) 		
	10-11	<p>Chapter 5</p> <p>Equations of Straight Lines</p> <ul style="list-style-type: none"> To find the equations of straight lines under different conditions To understand the general form of equations of straight lines To understand the features of straight lines To understand the possible intersections of two straight 	<p>Concept Review (pp.5.4 – 5.8)</p> <ul style="list-style-type: none"> Teachers can ask students to review the property of linear equations in two unknowns. Teachers can ask students to review the distance formula. Teachers can ask students to review the slope 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Bridging materials 	<ul style="list-style-type: none"> Review Worksheet Test Bank 5.0 	

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		lines	<p>formula.</p> <ul style="list-style-type: none"> Teachers can ask students to review parallel lines and perpendicular lines. Teachers can ask students to review the mid-point and section formulas. 				
			<p>5.1 Equations of Straight Lines (pp.5.9 – 5.22)</p> <ul style="list-style-type: none"> Students are expected to apply the two-point form, point-slope form and slope-intercept form to find the equation of a straight line. 	<p>2 hours /2 hours</p>	<ul style="list-style-type: none"> PowerPoint Teaching Videos (Two-point form) <u>Inspiring Activity 5.1</u> (p.5.11) 	<ul style="list-style-type: none"> Worksheet 5.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 5.1 Test Bank 5.1 	
			<p>5.2 General Form of Equations of Straight Lines (pp.5.23 – 5.39)</p> <ul style="list-style-type: none"> Teachers can sketch graphs of different straight lines for making comparisons on their magnitudes of slope, x-intercept and 	<p>1.5 hour /1.5 hours</p>	<ul style="list-style-type: none"> PowerPoint Simulation (Relation between two straight lines) Web Exploring 	<ul style="list-style-type: none"> Worksheet 5.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 5.2 Test Bank 5.2 	

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			<p>y-intercept.</p> <ul style="list-style-type: none"> Teachers may point out that the general form of the equation of a straight line is not unique. 				
			<p>Inquiry & Investigation – Normal Forms of Straight Lines (pp.5.56 – 5.57)</p> <ul style="list-style-type: none"> Teachers can discuss with students the applications of the normal form. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Intensive Practice Open-ended Questions Ongoing Assessment Package: Formative Assessment 5 Test Bank (Multiple-choice Questions) 		
	12-14	<p>Chapter 6 More about Polynomials</p> <ul style="list-style-type: none"> To manipulate the division of polynomials and to understand the division algorithm To learn and to apply the remainder theorem To understand the factor theorem and to apply it in factorization of polynomials up to degree 3 <p>Non-foundation</p> <ul style="list-style-type: none"> To understand the concepts of the greatest common divisor and the least common multiple of polynomials 	<p>Concept Review (pp.6.4 – 6.6)</p> <ul style="list-style-type: none"> Teachers can help students review the concepts of polynomials. Teachers can help students review the how to factorize polynomials Teachers can help students review how to solve simultaneous linear equations in two 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Bridging Materials 	<ul style="list-style-type: none"> Review Worksheet Test Bank 6.0 	

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		<p>Non-foundation</p> <ul style="list-style-type: none"> To perform addition, subtraction, multiplication and division of algebraic fractions 	unknowns.				
			<p>6.1 Basic Operations of Polynomials (pp.6.7 – 6.16)</p> <ul style="list-style-type: none"> Teacher can help students review addition, subtraction and multiplication of polynomials in one variable. Teachers can introduce the method of long division to find the quotient and remainder in the division of polynomials. Teachers can introduce the division algorithm of polynomials. Teachers may point out that the degree of the 	<p>3.5 hours /3.5 hours</p>	<ul style="list-style-type: none"> PowerPoint Teaching Video (Long division of polynomials) 	<ul style="list-style-type: none"> Worksheet 6.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 6.1 Test Bank 6.1 	

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			remainder must be less than that of the divisor in the division of polynomials.				
			6.2 Remainder Theorem (pp.6.16 – 6.22) <ul style="list-style-type: none"> Student should learn how to find the remainder by using the remainder theorem. 	2.5 hours /2.5 hours	<ul style="list-style-type: none"> PowerPoint <u>Inspiring Activity 6.1</u> (p.6.16) 	<ul style="list-style-type: none"> Worksheet 6.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 6.2 Test Bank 6.2 	
			6.3 Factor Theorem (pp.6.23 – 6.31) <ul style="list-style-type: none"> Teachers can introduce the factor theorem and its applications. Teachers may point out the limitation of the use of factor theorem. 	2.5 hours /2.5 hours	<ul style="list-style-type: none"> PowerPoint <ul style="list-style-type: none"> <u>Inspiring Activity 6.2</u> (p.6.26) 	<ul style="list-style-type: none"> Worksheet 6.3 (Sets 1 & 2) Ongoing Assessment Package: Quiz 6.3 Test Bank 6.3 	
			Non-foundation 6.4 The G.C.D. and the L.C.M. of Polynomials (pp.6.32 – 6.38)	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 6.4 (Sets 1 & 2) Ongoing 	

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			<ul style="list-style-type: none"> Teachers can introduce the greatest common divisor (G.C.D.) and the least common multiple (L.C.M.) for two or more polynomials. 			Assessment Package: Quiz 6.4 <ul style="list-style-type: none"> Test Bank 6.4 	
			<p>Non-foundation</p> <p>6.5 Rational Functions (pp.6.38 – 6.45)</p> <ul style="list-style-type: none"> Teachers can introduce addition, subtraction, multiplication and division of rational fractions. Teachers may point out that the rule ‘do multiplication and division first, then addition and subtraction’ can also be applied to the mixed operation of rational functions. 	2.5 hours /2.5 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 6.5 (Sets 1 & 2) Ongoing Assessment Package: Quiz 6.5 Test Bank 6.5 	
			Inquiry & Investigation – Interpolating Polynomial	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Intensive Practice Open-ended Questions Ongoing Assessment Package: 		

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			<p>(pp.6.58 – 6.59)</p> <ul style="list-style-type: none"> Teachers can discuss with students the errors of interpolating polynomials. 		<p>Formative Assessment 6</p> <ul style="list-style-type: none"> Test Bank (Multiple-choice Questions) 		
<p>Second Term (2/1/2017-17/7/2017, Weeks 19 to 47)</p>	19-22	<p>Non-foundation</p> <p>Chapter 7 Exponential and Logarithmic Functions</p> <ul style="list-style-type: none"> To understand the definitions and the laws of rational indices To understand the definition and properties of logarithms and the change of base To understand the properties of exponential functions and logarithmic functions and recognize the features of their graphs To solve exponential and logarithmic equations To appreciate the applications of logarithms To appreciate the development of the concepts of logarithms 	<p>Concept Review (pp.7.4 – 7.5)</p> <ul style="list-style-type: none"> Teachers can help students review the definition of integral indices Teachers can help students review the laws of integral indices. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Bridging Materials 	<ul style="list-style-type: none"> Review Worksheet Test Bank 7.0 	

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			<p>7.1 Rational Indices (pp.7.6 – 7.16)</p> <ul style="list-style-type: none"> Teachers should clarify the difference between a radical and a surd to students. 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint <u>Inspiring Activity 7.1</u> (p.7.8) 	<ul style="list-style-type: none"> Worksheet 7.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 7.1 Test Bank 7.1 	
			<p>7.2 Equations Involving Indices (pp.7.16 – 7.21)</p> <ul style="list-style-type: none"> Teachers may point out that it is important to balance both sides of the equation. If $y < 0$, it is impossible to find the value of x such that $y = a^x$ for $a > 0$ and $a \neq 1$. Teachers may ask students to verify it with different values of a. 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint Inspiring Activity 7.2 (p.7.22) 	<ul style="list-style-type: none"> Worksheet 7.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 7.2 Test Bank 7.2 	
			<p>7.3 Logarithms (pp.7.21 – 7.28)</p> <ul style="list-style-type: none"> Teachers can introduce common logarithm by showing the log button on a calculator and further 	1.5 hours /1.5 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 7.3 (Sets 1 & 2) Ongoing Assessment Package: Quiz 7.3 	

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			define logarithmic functions and their properties.			<ul style="list-style-type: none"> Test Bank 7.3 	
			7.4 Using Logarithms to Solve Equations (pp.7.28 – 7.33) <ul style="list-style-type: none"> Teachers can point out the need of logarithm to solve some exponential equations. 	3 hours /3 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 7.4 (Sets 1 & 2) Ongoing Assessment Package: Quiz 7.4 Test Bank 7.4 	
			7.5 Logarithms to the Base a (pp.7.28 – 7.33) <ul style="list-style-type: none"> Teachers can introduce logarithm to base a and emphasize the rules of common logarithm apply. 	1.5 hours /1.5 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 7.5 (Sets 1 & 2) Ongoing Assessment Package: Quiz 7.5 Test Bank 7.5 	
			7.6 Applications of Logarithms (pp.7.41 – 7.46) <ul style="list-style-type: none"> Teacher can point out that there are problems involving data with extremely large or 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint Web Exploring 	<ul style="list-style-type: none"> Worksheet 7.6 (Sets 1 & 2) Ongoing Assessment Package: Quiz 7.6 	

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			extremely small values such as the loudness of sound, the energy released during an earthquake, and the distance between planets.			<ul style="list-style-type: none"> • Test Bank 7.6 	
			7.7 Exponential and Logarithmic Functions (pp.7.47 – 7.59) <ul style="list-style-type: none"> • Teachers may remind students that the function $f(x) = a^x$ is the inverse function of $f(x) = \log_a x$, and vice versa. 	3 hours /3 hours	<ul style="list-style-type: none"> • PowerPoint • Inspiring Activity 7.3 (pp.7.47 – 7.48) • Inspiring Activity 7.4 (p.7.51) • Inspiring Activity 7.5 (pp.7.53 – 7.54) • Simulation (Graphs of exponential functions) • Simulation (Graphs of logarithmic functions) • e-Figure Gallery 	<ul style="list-style-type: none"> • Worksheet 7.7 (Sets 1 & 2) • Ongoing Assessment Package: Quiz 7.7 • Test Bank 7.7 	
			Inquiry & Investigation – The Historical Development of Logarithms (p.7.74 – 7.75) <ul style="list-style-type: none"> • Teachers may teach students how to use the 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> • Web Exploring • Intensive Practice • Open-ended Questions • Ongoing Assessment Package: Formative Assessment 7 		

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			logarithm table and anti-logarithm table. <ul style="list-style-type: none"> Teachers may ask students to compare the results of 'Further Investigation' by using the tables and by using a calculator. 		<ul style="list-style-type: none"> Test Bank (Multiple-choice Questions) 		
	24-25	Chapter 8 Quadratic Functions and Graphs <ul style="list-style-type: none"> To find the optimum values of quadratic functions graphically <div style="background-color: #cccccc; border-radius: 10px; padding: 2px; display: inline-block; font-size: 0.8em;">Non-foundation</div> To understand the method of completing the square <div style="background-color: #cccccc; border-radius: 10px; padding: 2px; display: inline-block; font-size: 0.8em;">Non-foundation</div> To find the optimum values of quadratic functions by the algebraic method <div style="background-color: #cccccc; border-radius: 10px; padding: 2px; display: inline-block; font-size: 0.8em;">Non-foundation</div> To recognize the practical problems involving the 	Concept Review (pp.8.4 – 8.5) <ul style="list-style-type: none"> Teachers can help students review the properties of quadratic graphs 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Bridging Materials 	<ul style="list-style-type: none"> Review Worksheet Test Bank 8.0 	

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		optimum values of quadratic functions					
			<p>8.1 Optimum Values of Quadratic Functions (pp.8.6 – 8.18)</p> <ul style="list-style-type: none"> Students should recognize the vertex from quadratic function in the form $y = a(x - h)^2 + k$. <p>Non-foundation</p> <ul style="list-style-type: none"> By the method of completing the square, students can find the extreme values of a function, and hence the extreme points and the axis of symmetry. <p>Non-foundation</p> <ul style="list-style-type: none"> Teachers can remind students that the minimum and maximum values k may be expressed as $-\frac{\Delta}{4a}$ for easy memory. 	2.5 hours /2.5 hours	<ul style="list-style-type: none"> PowerPoint Inspiring Activity 8.1 (p.8.8) Teaching Video (Completing the square 1) Teaching Video (Completing the square 2) Simulation (Quadratic graphs) 	<ul style="list-style-type: none"> Worksheet 8.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 8.1 Test Bank 8.1 	
			<p>Non-foundation</p> <p>8.2 Practical Problems</p>	2 hours			

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			<p>Involving the Optimum Values of Quadratic Equations (pp.8.18 – 8.24)</p> <ul style="list-style-type: none"> Students should be able to find the minimum or maximum values in practical problem 	/2 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 8.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 8.2 Test Bank 8.2 	
			<p>Inquiry & Investigation – Contribution of Mohammed to the Method of Completing the Square (p.8.36 – 8.37)</p> <ul style="list-style-type: none"> Teachers can introduce the geometric methods in the method of completing the square. 		<ul style="list-style-type: none"> Web Exploring Intensive Practice Open-ended Questions Ongoing Assessment Package: Formative Assessment 8 Test Bank (Multiple-choice Questions) 		
	26-28	<p>Chapter 9 Trigonometry</p> <ul style="list-style-type: none"> To understand the concepts of angles and quadrants and reference angles To understand sine, cosine and tangent functions, and 	<p>Concept Review (pp.9.4 – 9.5)</p> <ul style="list-style-type: none"> Teachers can ask students to review trigonometric ratios in right-angled triangles. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Bridging Materials 	<ul style="list-style-type: none"> Review Worksheet Test Bank 9.0 	

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		<p>their graphs and properties, including maximum and minimum values and periodicity</p> <ul style="list-style-type: none"> To solve the trigonometric equations $a \sin \theta = b$, $a \cos \theta = b$ and $a \tan \theta = b$ (solutions in the interval from 0° to 360°) To simplify expressions including sine, cosine and tangent of $-\theta$, $90^\circ \pm \theta$, $180^\circ \pm \theta$, etc <p>Non-foundation</p> <ul style="list-style-type: none"> To solve other trigonometric equations (solutions in the interval from 0° to 360°) 	<ul style="list-style-type: none"> Teachers can ask students to review trigonometric ratios of special angles. Teachers can ask students to review trigonometric identities. 				
			<p>9.1 Angles and Quadrant (pp.9.6 – 9.10)</p> <ul style="list-style-type: none"> Teachers can remind students that angle of rotation is different from true bearings. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 9.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 9.1 Test Bank 9.1 	

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			<p>9.2 Trigonometric Ratios of Arbitrary Angles (pp.9.11 – 9.17)</p> <ul style="list-style-type: none"> Teachers can introduce the definition of trigonometric ratios of arbitrary angles. Teachers may remind students that the trigonometric ratios may be positive or negative depending upon the quadrant in which the angle lies. 	1 hour /1 hour	<ul style="list-style-type: none"> PowerPoint <u>Inspiring Activity 9.1</u> (p.9.13) 	<ul style="list-style-type: none"> Worksheet 9.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 9.2 Test Bank 9.2 	
			<p>9.3 Finding Trigonometric Ratios Without Using a Calculator (pp.9.18 – 9.28)</p> <ul style="list-style-type: none"> Teachers can introduce the concept of reference angle and finding trigonometric ratios by using the reference angle. Teachers may point out that if one of the trigonometric ratios is 	1 hour /1 hour	<ul style="list-style-type: none"> PowerPoint <u>Inspiring Activity 9.2</u> (pp.9.19 – 9.20) 	<ul style="list-style-type: none"> Worksheet 9.3 (Sets 1 & 2) Ongoing Assessment Package: Quiz 9.3 Test Bank 9.3 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			<p>given, the other trigonometric ratios of the angle can be found by the definitions.</p> <ul style="list-style-type: none"> Teachers can introduce the trigonometric ratios of the angles formed by the coordinate axes. 				
			<p>9.4 Trigonometric Identities (pp.9.28 – 9.34)</p> <ul style="list-style-type: none"> Teachers may introduce trigonometric identities and the use of trigonometric identities to simplify expressions. 	1 hour /1 hour	<ul style="list-style-type: none"> PowerPoint Teaching Video (Trigonometric identities) <u>Inspiring Activity 9.3</u> (pp.9.28 – 9.29) 	<ul style="list-style-type: none"> Worksheet 9.4 (Sets 1 & 2) Ongoing Assessment Package: Quiz 9.4 Test Bank 9.4 	
			<p>9.5 Graphs of Trigonometric Functions (pp.9.34 – 9.45)</p> <ul style="list-style-type: none"> Students should be able to sketch and recognize the graphs of sine, cosine and tangent and identify their periodicity and the ranges of values of trigonometric 	1.5 hours /1.5 hours	<ul style="list-style-type: none"> PowerPoint Web Exploring Teaching Video (To generate a sine curve using the unit circle method) Teaching Video (To generate a cosine curve using the unit circle method) Teaching Video (To generate a 	<ul style="list-style-type: none"> Worksheet 9.5 (Sets 1 & 2) Ongoing Assessment Package: Quiz 9.5 Test Bank 9.5 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			<p>functions.</p> <ul style="list-style-type: none"> Teachers may ask students to draw the graphs of sine, cosine and tangent using computer software. 		<p>tangent curve using the unit circle method)</p> <ul style="list-style-type: none"> Simulation (Graphs of trigonometric functions) 		
			<p>9.6 Trigonometric Equations (pp.9.45 – 9.59)</p> <ul style="list-style-type: none"> Students should make use of reference angle to find the solution of simple trigonometric equations in the interval of 0° to 360°. By reading graphs or adding a suitable straight line on a trigonometric graph, students are guided to find solutions to trigonometric equations. <p>Non-foundation</p> <ul style="list-style-type: none"> Teachers can introduce the skills in solving some harder trigonometric equations. 	<p>2 hours /2 hours</p>	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 9.6 (Sets 1 & 2) Ongoing Assessment Package: Quiz 9.6 Test Bank 9.6 	
			Inquiry & Investigation –	0.5 hour	<ul style="list-style-type: none"> Intensive Practice 		

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			<p>More about Coordinates (pp.9.75 – 9.76)</p> <ul style="list-style-type: none"> Teachers can demonstrate the conversion between polar coordinate system and rectangular coordinate system using a calculator. Teachers can ask students to draw the graph of the function in polar coordinate by computer software. 	/0.5 hour	<ul style="list-style-type: none"> Open-ended Questions Ongoing Assessment Package: Formative Assessment 9 Test Bank (Multiple-choice Questions) 		
	29-32	<p>Non-foundation</p> <p>Chapter 10</p> <p>Important Formulas in Trigonometry</p> <ul style="list-style-type: none"> To study and use the formula $\frac{1}{2}ab\sin C$ for calculating the areas of triangles To study and use the sine formula to solve oblique triangles To study and use the cosine formula to solve oblique 	<p>Concept Review (pp.10.4 – 10.6)</p> <ul style="list-style-type: none"> Teachers can help students review the area of a triangle. Teachers can help students review the arc length and the area of a sector. Teachers can help students review how to 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Bridging Materials 	<ul style="list-style-type: none"> Review Worksheet Test Bank 10.0 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
		triangles <ul style="list-style-type: none"> To study and apply Heron's formula 	solve simple trigonometric equations.				
			10.1 Area of Triangles (pp.10.7 – 10.15) <ul style="list-style-type: none"> Teachers can introduce to students that the area of triangles can be found by the formula $\frac{1}{2}ab\sin C$. 	1 hour /1 hour	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 10.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 10.1 Test Bank 10.1 	
			10.2 Sine Formula (pp.10.15 – 10.26) <ul style="list-style-type: none"> Teachers may point out that if two sides and one non-included angle of a triangle are given, then the sine formula can be used to solve the triangle. Teachers may ask students to construct various types of triangles by using geometric software and conclude the number of triangles that can be 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint Teaching Video (The proof of the sine formula) Simulation (Solve triangles) 	<ul style="list-style-type: none"> Worksheet 10.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 10.2 Test Bank 10.2 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			formed.				
			<p>10.3 Cosine Formula (pp.10.27 – 10.37)</p> <ul style="list-style-type: none"> Teacher may point out that because of the limitations of sine formula, cosine formula is used as another tool to solve a triangle. Teachers may point out that if two sides and the included angle of a triangle are given, then the cosine formula can be applied to find the remaining side. Teachers may point out that if three sides of a triangle are given, the cosine formula can be used to find the unknown angles. 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint Teaching Video (The proof of the cosine formula) Simulation (Solve triangles) 	<ul style="list-style-type: none"> Worksheet 10.3 (Sets 1 & 2) Ongoing Assessment Package: Quiz 10.3 Test Bank 10.3 	
			<p>10.4 Heron's Formula (pp.10.38 – 10.45)</p> <ul style="list-style-type: none"> Teachers may point out if three sides of a triangle 	1 hour /1 hour	<ul style="list-style-type: none"> PowerPoint Simulation (Solve triangles) 	<ul style="list-style-type: none"> Worksheet 10.4 (Sets 1 & 2) Ongoing 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			are known, then Heron's Formula can be applied to find the area of the triangle.			Assessment Package: Quiz 10.4 • Test Bank 10.4	
			<p>Inquiry & Investigation – Other Proofs of the Cosine Formula (pp.10.60 – 10.61)</p> <ul style="list-style-type: none"> In this Inquiry and Investigation, the principle in the first proof is the same as the proof of Pythagoras' theorem by Euclid. For 'Further Investigation', the cosine ratio is used twice. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Intensive Practice Open-ended Questions Ongoing Assessment Package: Formative Assessment 10 Test Bank (Multiple-choice Questions) 		
	35-36	<p>Chapter 11 Variations</p> <ul style="list-style-type: none"> To understand direct and inverse variations and their applications to real-life problems To study the graphs of direct and inverse variations To understand joint and 	<p>Concept Review (pp.11.4 – 11.6)</p> <ul style="list-style-type: none"> Teachers can help students review the concept of ratio. Teachers can review how to find percentage change with students. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Bridging Materials 	<ul style="list-style-type: none"> Review Worksheet Test Bank 11.0 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
		partial variations and their applications to real-life problems	<ul style="list-style-type: none"> Teachers can review the methods of solving simultaneous equations with students. 				
			11.1 Direct Variations (pp.11.7 – 11.16) <ul style="list-style-type: none"> Teachers can introduce the properties of direct variations. 	1.5 hours /1.5 hours	<ul style="list-style-type: none"> PowerPoint <u>Inspiring Activity 11.1</u> (p.11.7) 	<ul style="list-style-type: none"> Worksheet 11.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 11.1 Test Bank 11.1 	
			11.2 Inverse Variations (pp.11.17 – 11.27) <ul style="list-style-type: none"> Teachers should remind students that an inverse variation can be represented graphically in two different ways. 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint <u>Inspiring Activity 11.2</u> (p.11.17) 	<ul style="list-style-type: none"> Worksheet 11.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 11.2 Test Bank 11.2 	
			11.3 Joint Variations (pp.11.27 – 11.36) <ul style="list-style-type: none"> Teachers should remind students that there is only one variation constant term in a joint variation. 	2 hours /2 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 11.3 (Sets 1 & 2) Ongoing Assessment Package: Quiz 11.3 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
						<ul style="list-style-type: none"> • Test Bank 11.3 	
			11.4 Partial Variations (pp.11.36 – 11.47) <ul style="list-style-type: none"> • Teachers should remind students that if a variable is the sum of two or more parts, the equation may have two or more variation constants. 	3 hours /3 hours	<ul style="list-style-type: none"> • PowerPoint 	<ul style="list-style-type: none"> • Worksheet 11.4 (Sets 1 & 2) • Ongoing Assessment Package: Quiz 11.4 • Test Bank 11.4 	
			Inquiry & Investigation – Road Safety (pp.11.62 – 11.63) <ul style="list-style-type: none"> • Teachers can point out that the stopping distance is the sum of thinking distance and braking distance. • In ‘Further Investigation’, the two-second’ rule is introduced. Teachers may point out that in bad conditions, the time gap may need to be double. 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> • Web Exploring • Intensive Practice • Open-ended Questions • Ongoing Assessment Package: Formative Assessment 11 • Test Bank (Multiple-choice Questions) 		
	37-38	Non-foundation Chapter 12 More about Quadratic	Concept Review (pp.12.4 –	0.5 hour /0.5 hour	<ul style="list-style-type: none"> • Test Bank 12.0 	<ul style="list-style-type: none"> • Review 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
		Equations <ul style="list-style-type: none"> To formulate and solve equations which can be transformed into quadratic equations To solve practical problems leading to quadratic equations 	12.5) <ul style="list-style-type: none"> Teachers can help students review the techniques required in solving different kinds of equations. 			Worksheet	
			12.1 Solving Equations that can be Transformed into Quadratic Equations (pp.12.6 – 12.14) <ul style="list-style-type: none"> Teachers can discuss with students the types of equations that can be transformed into quadratic equations, such as fractional equations, equations with higher degree or fractional degree, exponential and logarithmic equations. Teachers may remind students to check whether 	3 hours /3 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 12.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 12.1 Test Bank 12.1 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			<p>the answers obtained satisfy the given equation.</p> <ul style="list-style-type: none"> Teachers may point out that some equations may have non-real roots (complex roots). 				
			<p>12.2 Problems Involving Equations that can be Transformed into Quadratic Equations (pp.12.14 – 12.19)</p> <ul style="list-style-type: none"> Teachers should introduce the strategies for solving practical problems. 	2 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 12.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 12.2 Test Bank 12.2 	
			<p>Inquiry & Investigation – Solving Equations of Higher Degree (p.12.28 – 12.29)</p> <ul style="list-style-type: none"> Teachers can point out that using Vieta's substitution, we can solve some cubic equations which do not have rational roots. 	0.5 hours	<ul style="list-style-type: none"> Intensive Practice Open-ended Questions Ongoing Assessment Package: Formative Assessment 12 Test Bank (Multiple-choice Questions) 		

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			<ul style="list-style-type: none"> Teachers may point out a special property of the equation in 'Further Investigation'. The coefficients of it form a palindrome. 				
		<p>Non-foundation</p> <p>Chapter 13 Simultaneous Equations</p> <ul style="list-style-type: none"> To solve simultaneous equations in two unknowns (one linear and one quadratic) by the graphical method To solve simultaneous equations in two unknowns (one linear and one quadratic) by the algebraic method To solve practical problems leading to simultaneous equations 	<p>Concept Review (pp.13.4 – 13.7)</p> <ul style="list-style-type: none"> Teachers can help students review the graphical and algebraic methods in solving simultaneous linear equations Teachers can help students review the factor method and the quadratic formula to solve quadratic equations Teachers can review the three cases of the discriminant of a quadratic equation with students 	0.5 hour /0.5 hour	<ul style="list-style-type: none"> Bridging Materials 	<ul style="list-style-type: none"> Review Worksheet Test Bank 13.0 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			<p>13.1 Solving Simultaneous Equations by the Graphical Method (pp.13.8 – 13.16)</p> <ul style="list-style-type: none"> Teacher can remind students the point of intersection of the graphs is the solution of the simultaneous equations. Teacher may point out the three different possible outcomes when solving simultaneous equations in two unknowns graphically. Teacher may point out the limitation of the graphical method. 	1 hour /1 hour	<ul style="list-style-type: none"> PowerPoint Simulation (Quadratic graphs) 	<ul style="list-style-type: none"> Worksheet 13.1 (Sets 1 & 2) Ongoing Assessment Package: Quiz 13.1 Test Bank 13.1 	
			<p>13.2 Solving Simultaneous Equations by the Algebraic Method (pp.13.17 – 13.26)</p> <ul style="list-style-type: none"> By teaching the method of elimination, students can 	1.5 hours /1.5 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 13.2 (Sets 1 & 2) Ongoing Assessment Package: Quiz 13.2 	

School Term	Weeks	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	SL/AL	Teaching and Learning Activities	Consolidation and Assessment	Values#
			<p>eliminate one of the two unknowns and obtain a quadratic equation in one unknown.</p> <ul style="list-style-type: none"> Teachers may point out that the simultaneous equations do not have real solution but has non-real solutions. Teachers may remind students that the same method can be applied when xy terms are involved. 			<ul style="list-style-type: none"> Test Bank 13.2 	
			<p>13.3 Practical Problems Leading to Simultaneous Equations (pp.13.26 – 13.34)</p> <ul style="list-style-type: none"> Teachers should introduce the procedure in solving practical problems. 	1.5 hours /1.5 hours	<ul style="list-style-type: none"> PowerPoint 	<ul style="list-style-type: none"> Worksheet 13.3 (Sets 1 & 2) Ongoing Assessment Package: Quiz 13.3 Test Bank 13.3 	

* 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	<ul style="list-style-type: none"> 1. Accept & feel positive about himself 2. Appreciation & Gratitude 3. Empathy & Compassion 	<ul style="list-style-type: none"> 4. Forgiveness & Reconciliation 5. Service 6. Family as a basic unit of society; marriage is the foundation of a family
II. Strive for excellence	<ul style="list-style-type: none"> 7. Reflective 8. Commitment 9. Perseverance 	<ul style="list-style-type: none"> 10. Curiosity & willingness to learn 11. Value imagination and creativity
III. Respect and Justice	<ul style="list-style-type: none"> 12. Life is valuable and respectable 13. Openness to good in all things 14. Respect for himself & others 	<ul style="list-style-type: none"> 15. Integrity 16. Faithfulness
IV. Responsibility	<ul style="list-style-type: none"> 17. Freedom & Self-discipline 18. Care for the environment 	<ul style="list-style-type: none"> 19. Social Identities: citizen identity, national identity and global citizen identity
V. Faith	<ul style="list-style-type: none"> 20. Experience of God 21. Explore & practise one's faith 	<ul style="list-style-type: none"> 22. Appreciate religious liturgies