

LAW TING PONG SECONDARY SCHOOL
S4 MATHEMATICS 2020 – 21
Course Outline

1. Introduction to the Syllabus

The Department of Mathematics at LTPSS strives to develop students' mathematical knowledge, skills and concepts that can facilitate their future development in various aspects. Our syllabus aims to provide content knowledge which serves as a means to develop students' thinking abilities and foster students' generic skills and positive attitudes towards mathematics learning.

2. Learning Objectives

The S4 syllabus aims to:

2.1. Knowledge Domain

Induce children to understand and grasp the knowledge of the following:

- the quadratic equations
- the functions and graphs
- the equations of straight lines
- more about polynomials
- the exponential and logarithmic functions
- the variations
- more about trigonometry

2.2. Skill Domain

Develop the following skills and capabilities:

- numeracy
- problem-solving skill
- logical reasoning skills
- communication skills
- presentation skills

2.3. Attitude Domain

Foster the attitudes to be:

- aspiring to higher academic performance
- self-regulated
- inquiring
- reflective
- persistent
- willing to work cooperatively with people

3. Syllabus Details

Week	Delivery Schedule	Chapter/ Section (Suggested Teaching Ratio)	Learning Objectives	Summative Assessment
1	3/9–4/9 (1)	Classroom Rule	<ul style="list-style-type: none"> ● Collect Summer Holiday HW. ● Explore the rules of Maths lesson. 	
2	7/9–11/9 (3)	<u>Ch1 Quadratic Equations in One Unknown (I) (18)</u>	<ul style="list-style-type: none"> ● Understand the general form of a quadratic equation in one unknown and its roots. 	

		# DSE Factorization 1.2 Solving Quadratic Equations by the Factor Method (2)	<ul style="list-style-type: none"> Solve the quadratic equation using the factor method. 	
3	14/9–18/9 (6)	1.3 Solving Quadratic Equations by the Quadratic Formula (3) 1.4 Solving Quadratic Equations by the Graphical Method (4)	<ul style="list-style-type: none"> Solve the quadratic equation by taking square roots. Understand the quadratic formula. Solve quadratic equations using the quadratic formula. Solve a quadratic equation by plotting the graph and reading the x-intercepts. Understand the approximate nature of the roots obtained by using the graphical method. 	
4	21/9–25/9 (6)	8.3ABC Equations Reducible to Quadratic Equations *** (3) 1.5 Problems Leading to Quadratic Equations (3)	<ul style="list-style-type: none"> Solve equations (including fractional equations, equations of higher degree and equations with square root signs) which can be reduced to quadratic equations. Solve real-life problems that involve quadratic equations. 	
5	28/9–29/9 (2)	8.4 Practical Problems Leading to Quadratic Equations *** (3)	<ul style="list-style-type: none"> Solve practical problems involving equations which can be reduced to quadratic equations. 	
6	5/10–9/10 (6)	<u>Ch2 Quadratic Equations in One Unknown (II) (17)</u> 2.1 Nature of Roots of a Quadratic Equation (5)	<ul style="list-style-type: none"> Understand the relation between the discriminant of a quadratic equation and the nature of its roots. Understand the relation between the discriminant of a quadratic equation and the number of x-intercepts of the graph. 	Ch1 Test 8/10 LKS
7	12/10–16/10 (6)	2.2 Forming a Quadratic Equation with Given Roots (2) 2.3 Relations between Roots and Coefficients *** (5)	<ul style="list-style-type: none"> Form a quadratic equation with given roots. Form a quadratic equation using the sum and product of its roots. *** Understand the relations between the roots and coefficients of a quadratic equation. Form a quadratic equation whose roots are related to the roots of another quadratic equation. 	
8	19/10–23/10	1.1 Real Number System (1)	<ul style="list-style-type: none"> Understand the hierarchy of the real number system. 	

	(6)	<u># DSE Estimation & Error</u> 2.4 Complex Number System (4)	<ul style="list-style-type: none"> ● Understand the conversion between recurring decimals and fractions. ● Understand the historical development of complex numbers. ● Understand the definition of i. ● Understand the system of complex numbers $a + bi$. ● Define and perform addition, subtraction, multiplication and division of complex numbers. *** 	
9	27/10–30/10 (5)	<u>Ch3 Functions and Graphs (16)</u> 3.1 Introduction to Functions (2) (Optional) 3.2 Notation of a Function (3)	<ul style="list-style-type: none"> ● Recognize the intuitive concept of functions. ● Recognize the concepts of independent and dependent variables. ● Recognize the concepts of domain, co-domain and range of a function. ● Recognize the algebraic, tabular and graphical representations of a function. ● Recognize the notation of a function. ● Find the values of functions. 	Ch2 Test 29/10 YMH
10	2/11–6/11 (6)	3.3 Some Common Functions and their Graphs (5)	<ul style="list-style-type: none"> ● Understand the features of the graph of a constant function. ● Understand the features of the graph of a linear function. ● Understand the features of the graph of a quadratic function. 	
11	9/11–13/11 (0)	Term Break		
12	16/11–20/11 (6)	3.4 Optimum Values of Quadratic Functions (6)	<ul style="list-style-type: none"> ● Understand the optimum value of the quadratic function and the features of its graph. ● Understand the method of completing the square. *** ● Find the optimum value of the quadratic function by the algebraic method. *** ● Solve practical problems relating to the optimum value of a quadratic function. *** 	
13	23/11–27/11	<u>Ch5 More about Polynomials (22)</u>	<ul style="list-style-type: none"> ● Review the concepts of monomials and polynomials, and the terminologies 	

	(5.5)	5.1 Revision on Polynomials (1) 5.2 Division of Polynomials (4.5)	involved. <ul style="list-style-type: none"> ● Review the basic operations (addition, subtraction and multiplication) of polynomials. ● Understand and manipulate long division of polynomials up to simple quadratic divisor. ● Understand and apply division algorithm. 	
14	30/11–4/12 (6)	5.3 Remainder Theorem (4.5)	<ul style="list-style-type: none"> ● Understand and apply the remainder theorem. 	Ch3 Test 3/12 YN
15	7/12–11/12 (6)	5.4 Factor Theorem (5)	<ul style="list-style-type: none"> ● Understand and apply the factor theorem. ● Understand and apply the converse of the factor theorem. ● Use the factor theorem to factorize polynomials up to degree 3. 	
16	14/12–18/12 (6)	5.5 H.C.F and L.C.M. of Polynomials *** (2.5) 5.6 Rational Functions and their Manipulations *** (4.5) # DSE Change of Subject	<ul style="list-style-type: none"> ● Understand the concepts of the highest common factor (H.C.F.) and the lowest common multiple (L.C.M.) of polynomials. *** ● Find the H.C.F. and L.C.M. of polynomials. *** ● Understand rational functions. ● Perform addition, subtraction, multiplication and division of rational functions. *** 	Ch5 Test 17/12 CKI
17	21/12–22/12 (0)	Christmas Fun Day & Christmas Celebration		
18	28/12–1/1 (0)	Christmas and New Year Holidays		
19	4/1–8/1	<u>Ch9 Variations (13.5)</u>	<ul style="list-style-type: none"> ● Understand the basic concept of variation through daily life examples. 	

	(6)	<u># DSE Simultaneous Equations</u> <u># DSE Percentages</u> 9.1 Basic Concept of Variation (0.5) 9.2 Direct Variation (3) 9.3 Inverse Variation (3)	<ul style="list-style-type: none"> ● Understand the concept of direct variation. ● Explore the algebraic and graphical representations of two quantities in direct variation. ● Solve real life problems involving direct variation. ● Understand the concept of inverse variation. ● Explore the algebraic and graphical representations of two quantities in inverse variation. ● Solve real life problems involving inverse variation. 	
20	11/1–15/1 (6)	9.4 Joint Variation (3.5) 9.5 Partial Variation (3.5)	<ul style="list-style-type: none"> ● Understand the concept of joint variation. ● Solve real life problems involving joint variation. ● Understand the concept of partial variation. ● Solve real life problems involving partial variation. 	Ch9 Test 21/1 LKS
21	18/1–22/1 (5)	Revision (Ch1,2,3,5,9)		
22	25/1–29/1 (0)	Summative Assessment (Ch1,2,3,5,9) CKI		
23	1/2–5/2 (0)	Summative Assessment (Ch1,2,3,5,9)		
24	8/2–10/2 (0)	Summative Assessment (Ch1,2,3,5,9)		
25	15/2–19/2 (0)	Lunar New Year Holiday		
26	22/2–26/2	<u>Ch4 Equations of Straight Lines</u>	<ul style="list-style-type: none"> ● Understand and apply the point-slope form to find equations of straight lines. 	

	(6)	(18.5) 4.1 Equations of Straight Lines (5.5) 4.2 General Form of Equation of a Straight Line (2.5)	<ul style="list-style-type: none"> ● Understand and apply the two-point form to find equations of straight lines. ● Understand and apply the slope-intercept form to find equations of straight lines. ● Find the equations of oblique lines passing through the origin, horizontal lines and vertical lines. ● Learn the techniques in solving problems involving equations of straight lines. ● Understand the general form of equation of a straight line. ● Explore the properties of a straight line from its equation in general form. 	
27	2/3–5/3 (5)	4.3 Possible Intersection of Straight Lines (3)	<ul style="list-style-type: none"> ● Solve problems involving intersection of straight lines on the coordinate plane. ● Determine the number of intersections of two straight lines from their equations. 	
28	8/3–12/3 (6)	8.1 Solving Simultaneous Equations by the Algebraic Method *** (3.5)	<ul style="list-style-type: none"> ● Solve simultaneous equations, one linear and one quadratic, by the algebraic method. ● Solve practical problems involving simultaneous equations. 	
29	15/3–19/3 (2)	8.2 Solving Simultaneous Equations by the Graphical Method *** (4)	<ul style="list-style-type: none"> ● Solve simultaneous equations, one linear and one quadratic, by the graphical method. ● Understand the use and the limitations of the graphical method in solving equations. ● Use the discriminant to find the number of intersections between a straight line and a quadratic curve. 	
30	22/3–26/3 (1)	Experiential Learning Week		
31	29/3–2/4 (0)	Easter Holiday		
32	7/4–9/4	<u>Ch10 More about Trigonometry</u>	<ul style="list-style-type: none"> ● Understand the definitions of angle of rotation and quadrant. 	

	(2)	(13) 10.1 Angles of Rotation (1) 10.2 Trigonometric Ratios of Any Angle (2)	<ul style="list-style-type: none"> Recognize the concepts of angles with the same terminal side on a rectangular coordinate plane. Understand the definitions of trigonometric ratios, including sine ratio, cosine ratio and tangent ratio, of any angle. Recognize the values of trigonometric ratios of 0°, 90°, 180°, 270° and 360°. Understand the signs of trigonometric ratios in different quadrants and the ‘CAST’ diagram. 	
33	12/4–16/4 (6)	10.3 Graphs of Trigonometric Functions (3.5) 10.4 Graphical Solutions of Trigonometric Equations (1.5)	<ul style="list-style-type: none"> Understand the features of graphs of sine, cosine and tangent functions. Recognize the features including periodicity and optimum values from the graphs of the trigonometric functions. Solve trigonometric equations such as $\sin x = k$ graphically, where k is a constant. 	Ch4 Test 15/4 CKI
34	19/4–23/4 (6)	10.5 Trigonometric Identities (3) 10.6 Solving Trigonometric Equations by Algebraic Methods (2)	<ul style="list-style-type: none"> Learn the trigonometric identities for trigonometric ratios of $(180^\circ \pm \theta)$, $(360^\circ \pm \theta)$, $-\theta$, $(90^\circ \pm \theta)$ and $(270^\circ \pm \theta)$. Simplify trigonometric expressions and prove trigonometric identities. Solve various trigonometric equations algebraically. 	
35	26/4–30/4 (6)	Ch6 Exponential Functions (10.5) # DSE Indices 6.1 Laws of Rational Indices *** (4) 6.2 Exponential Equations *** (2)	<ul style="list-style-type: none"> Understand the definitions of radicals and rational indices. Understand and use the laws of rational indices. Solve equations in the form $x^{\frac{m}{n}} = c$. Solve exponential equations by using the laws of indices. 	Ch10 Test 29/4 YMH
36	3/5–7/5 (6)	8.3D Equations Reducible to Quadratic Equations *** (0.5) 6.3 Exponential Functions and their Graphs *** (4)	<ul style="list-style-type: none"> Solve exponential equations which can be reduced to quadratic equations. Understand the exponential functions and their properties. Recognize the features of the graphs of exponential functions. 	
37	10/5–14/5	Ch7 Logarithmic Functions (14.5)	<ul style="list-style-type: none"> Understand the definition of common logarithms. 	

	(6)	7.1 Common Logarithms *** (5.5) 7.2 Applications of Common Logarithms *** (2.5)	<ul style="list-style-type: none"> Learn the properties of common logarithms. Apply the properties of common logarithms to solve problems. Solve logarithmic equations. Solve exponential equations by converting them into logarithmic equations. 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. 	
38	17/5–21/5 (4)	7.3 Logarithms to an Arbitrary Base *** (2)	<ul style="list-style-type: none"> Understand the definition of logarithms to an arbitrary base. Learn the properties of logarithms to an arbitrary base. Apply the properties of logarithms to an arbitrary base to solve problems. Solve logarithmic equations to an arbitrary base. 	
39	24/5–28/5 (6)	8.3E Equations Reducible to Quadratic Equations *** (0.5) 7.4 Graphs of Logarithmic Functions and their Features *** (3) 7.5 Historical Development of the Concept of Logarithms *** (1) (Optional)	<ul style="list-style-type: none"> Solve logarithmic equations which can be reduced to quadratic equations. Understand the logarithmic functions and their properties. Recognize the features of the graphs of logarithmic functions. Understand the relationship between $y = a^x$ and $y = \log_a x$. Appreciate the development of the concept of logarithms. 	Ch67 Test 3/6 PYU
40	31/5–4/6 (6)	Revision (Ch1–10)		
41	7/6–11/6 (4)	Revision (Ch1–10)		
42	15/6–18/6 (0)	Final Exam LKS & YMH		
43	21/6–24/6	Final Exam		

	(4)	
44	28/6–30/6 (3)	Paper Checking

*** Non-foundation Topics

DSE Junior Topics

4. Formative Assessment Modes

We may assess our students' learning in the following modes:

- Discussions and presentations
- Projects
- Poster walks

5. Summative Assessments

Tests and examination will be conducted during the year to judge the extent of students' learning. The purpose is to grade or certify students, evaluate their progress or to find out the effectiveness of a curriculum.

Assessment	Format	Mark Distribution	Time
Mid-term Assessment	Section A: MC	100	1 hr 45 mins
	Section B: Short questions		
	Section C: Conventional questions		
Final Exam	Paper 1	Section A1: Short questions	2 hrs 15 mins
		Section A2: Short questions	
		Section B: Conventional questions	
	Paper 2	Section A: MC	1 hr 15 mins
Section B: MC			

Weighting of Component Parts:

Term	Assessment item	1 st term		2 nd term		Final Assessment
		CA	SA	CA	SA	
1 st term	Homework/ Section Quizzes	20%	–	–	–	30%
	Chapter Tests	80%	–	–	–	
	Mid-term Assessment	–	100%	–	–	10%
2 nd term	Homework/ Section Quizzes	–	–	20%	–	30%
	Chapter Tests	–	–	80%	–	
	Final Exam Paper 1	–	–	–	65%	30%
	Final Exam Paper 2	–	–	–	35%	
Total		100%	100%	100%	100%	100%

6. Grade Boundaries

Students' attainment at different stages of the school year is reported in performance levels. The mark ranges for the different performance levels are as follows.

Performance level	Mark Range
5**	93 above
5*	88-92
5	80-87
4	65-79
3	48-64
2	35-47
1^	Below 35

^Level 1 denotes performance not meeting the required standards of the school

For the descriptors of the performance levels, parents are advised to consult the information from the HKEAA at

https://www.hkeaa.edu.hk/DocLibrary/HKDSE/Subject_Information/math/math-compulsory-level-descriptors-e.pdf

7. Course Materials

(Book 4A) Mathematics in Action 4A (2nd Edition) – Longman Hong Kong Education.

(Book 4B) Mathematics in Action 4B (2nd Edition) – Longman Hong Kong Education.

DSE Pre-Training Mathematics (Compulsory Part) Section A

MCQ Fast-track Course Mathematics (Compulsory Part)

Mathematics Classwork Book

Mathematics Homework Book

Mathematics Folder

Calculator

8. Role of Parents at home

Parents are encouraged to talk to their child about their learning in class on a regular basis. They should also discuss the results obtained by their child to find out how well they are doing in their mathematics course.

LAW TING PONG SECONDARY SCHOOL
S5 MATHEMATICS 2020 – 21
Course Outline

1. Introduction to the Syllabus

The Department of Mathematics at LTPSS strives to develop students' mathematical knowledge, skills and concepts that can facilitate their future development in various aspects. Our syllabus aims to provide content knowledge which serves as a means to develop students' thinking abilities and foster students' generic skills and positive attitudes towards mathematics learning.

2. Learning Objectives

The S5 syllabus aims to:

2.1. Knowledge Domain

Induce children to understand and grasp the knowledge of the following:

- Properties and tangents of circles
- inequalities and linear programming
- trigonometry in 2-D and 3-D problems
- equations of circles
- locus
- measures of dispersion
- permutation and combination
- the variations
- more about probability
- sequences

2.2. Skill Domain

Develop the following skills and capabilities:

- conceptualize inquire
- reasoning skills
- formulate
- solve problems mathematically
- numeracy
- presentation skills

2.3. Attitude Domain

Foster the attitudes to be:

- aspiring to higher academic performance
- self-regulated
- inquiring
- reflective
- perseverant
- willing to work cooperatively with people

3. Syllabus Details

Week	Delivery Schedule	Chapter/ Section (Suggested Teaching Ratio)	Learning Objectives	Summative Assessment
1	1/9 – 4/9 (2)	Ch3 Inequalities 3.1 Compound Linear Inequalities in One Unknown	<ul style="list-style-type: none"> ● Learn the concept of compound linear inequalities in one unknown connected by logical operators ‘and’ or ‘or’. ● Learn how to solve compound linear inequalities in one unknown and represent the solutions graphically. 	

			<ul style="list-style-type: none"> ● Solve problems leading to compound linear inequalities. 	
2	7/9 – 11/9 (6)	<p>3.1 Compound Linear Inequalities in One Unknown (Con't)</p> <p>3.2 Solving Quadratic Inequalities in One Unknown by the Graphical Method</p>	<ul style="list-style-type: none"> ● Learn to solve quadratic inequalities in one unknown by the graphical method. 	<p>Section Quiz on Friday 3:00-3:30pm online</p>
3	14/9 – 18/9 (6)	<p>3.3 Solving Quadratic Inequalities in One Unknown by the Algebraic Method</p> <p>3.4 Problems Leading to Quadratic Inequalities in One Unknown</p>	<ul style="list-style-type: none"> ● Learn to solve quadratic inequalities in one unknown by the method of tabulation. ● Learn to solve quadratic inequalities in one unknown algebraically when the corresponding quadratic equation has a double real root or no real roots. ● Learn to solve real-life application problems involving quadratic inequalities in one unknown. Learn to solve real-life application problems involving quadratic inequalities in one unknown. 	
4	21/9 – 25/9 (6)	<p>Ch4 Linear Programming</p> <p>4.1 Linear Inequalities in Two Unknowns</p> <p>4.2 Solving Systems of Linear Inequalities in Two Unknowns Graphically</p>	<ul style="list-style-type: none"> ● Learn the concept of linear inequalities in two unknowns and their graphical representations. ● Learn to solve system of linear inequalities in two unknowns graphically 	
5	28/9 – 2/10 (3)	<p>4.3 Linear Programming</p>	<ul style="list-style-type: none"> ● Understand the concept of linear programming and learn how to find the optimal solution subject to given constraints. 	
6	5/10 – 9/10 (6)	<p>4.4 Applications of Linear Programming</p> <p>Ch7 Equations of Circles</p> <p>7.1 Equations of Circles</p>	<ul style="list-style-type: none"> ● Learn how to solve real-life problems on linear programming. ● Understand and apply the standard form to find equations of circles. ● Understand and apply the general form to find equations of circles. 	

7	12/10 – 16/10 (6)	7.2 More about equations of Circles 7.3 Intersection between a Straight Line and a Circle	<ul style="list-style-type: none"> ● Find equations of circles based on other given information. ● Learn to find the coordinates of the intersection(s) of a straight line and a circle. ● Determine the number of intersections of a straight line and a circle. ● Find the equations of tangents to a circle ● 	
8	19/10 – 23/10 (6)	Ch8 Locus 8.1 Concept of a Locus 8.2 Sketch and Description of a Locus 8.3 Algebraic Equation of a Locus	<ul style="list-style-type: none"> ● Understand the concept of a locus. ● Sketch and describe the locus of moving points on a plane satisfying given conditions. ● Recognize that different conditions can give rise to the same locus. ● Describe the locus of points with algebraic equations. ● 	
9	26/10 – 30/10 (5)	Ch1 Basic Properties of Circle 1.1 Basic terms of a Circle 1.2 Chords of a Circle 1.3 Angles in a Circle	<ul style="list-style-type: none"> ● Understand the basic terminologies related to a circle. ● Understand the basic properties of chords. ● Learn to apply the basic properties of chords of circle to solve related geometric problems. ● Understand the angle properties of a circle. ● Learn to apply the angle properties of a circle to solve related geometric problems. 	
10	2/11 – 6/11 (6)	1.4 Relationships among Arcs, Chords and Angles 1.5 Cyclic Quadrilaterals 1.6 Concyclic Points	<ul style="list-style-type: none"> ● Understand the relationships among arcs, chord and angles. ● Learn to apply the relationships among arcs, chords and angles to solve related geometric problems. ● Understand the basic properties of cyclic quadrilaterals. ● Learn to apply the basic properties of cyclic quadrilaterals to solve related geometric 	

			problems. <ul style="list-style-type: none"> ● Understand the definition of concyclic points. ● Learn to test for concyclic points. 	
11	9/11 – 13/11 (0)	Term Break		
12	16/11 – 20/11 (6)	Ch2 Tangents to Circles 2.1 Tangents to a Circle and their Properties 2.2 Tangents from an External Point	<ul style="list-style-type: none"> ● Understand and apply the basic properties of tangents to a circle. ● Understand and apply the properties of tangents from an external point to a circle 	
13	23/11 – 27/11 (5)	2.2 Tangents from an External Point (Con't) 2.3 Angles in the Alternate Segment	<ul style="list-style-type: none"> ● Understand and apply the properties of angles in the alternate segment of a circle 	
14	30/12 – 4/12 (6)	Ch5 Applications of Trigonometry in 2-dimensional Problems 5.1 Area of a Triangle 5.2 The Sine Formula	<ul style="list-style-type: none"> ● Understand and use the formula to find the areas of triangle. ● Understand and use the Heron's formula to find the areas of triangles. ● Understand and use the sine formula to solve triangles. 	
15	7/12 – 11/12 (5)	5.3 The Cosine formula 5.4 Trigonometric Problems in Two Dimensions	<ul style="list-style-type: none"> ● Understand and use the cosine formula to solve triangles. ● Apply trigonometric knowledge in solving 2-dimensional problems relating to angle of elevation/depression. ● Apply trigonometric knowledge in solving 2-dimensional problems relating to bearings 	
16	14/12 – 18/12 (6)	5.4 Trigonometric Problems in Two Dimensions (Con't)	<ul style="list-style-type: none"> ● Apply trigonometric knowledge in solving 2-dimensional problems relating to angle of elevation/depression. 	

			<ul style="list-style-type: none"> ● Apply trigonometric knowledge in solving 2-dimensional problems relating to bearings 	
17	21/12 –25/12 (0)	Christmas Fun Day & Christmas Celebration		
18	28/12-1/1(0)	Christmas and New Year Holidays		
19	4/1 – 8/1 (6)	Ch6 Applications of Trigonometry in 3-dimensional Problems 6.1 Basic Terminologies in 3-dimensional Problems 6.2 More Examples on 3-dimensional Problems	Ch6 Applications of Trigonometry in 3-dimensional Problems 6.1 Basic Terminologies in 3-dimensional Problems 6.2 More Examples on 3-dimensional Problems	
20	11/1 – 15/1 (6)	6.3 Practice 3-dimensional Problems	6.3 Practice 3-dimensional Problems	
21	18/1 – 22/1 (6)	Revision		
22	25/1–29/1 (0)	Mid Year assessment + Paper checking		
23	1/2–5/2 (0)	Mid Year assessment + Paper checking		
24	8/2–10/2 (0)	Mid Year assessment + Paper checking		
25	15/2–19/2 (3)	Chinese New Year Holidays		

26	22/2 – 26/2 (6)	<p>Ch9 Measures of Dispersion</p> <p>9.1 Introduction to Measures of Dispersion</p> <p>9.2 Range and Inter-quartile Range</p>	<ul style="list-style-type: none"> ● Understand the concept of dispersion. ● Understand the concepts of range and inter-quartile range. ● Find the range and inter-quartile range for both grouped and ungrouped data sets. 	
27	1/3 – 5/3 (5)	<p>9.3 Box-and-Whisker Diagram</p> <p>9.4 Standard Deviation</p>	<ul style="list-style-type: none"> ● Construct box-whisker diagrams. ● Understand the concept of standard deviation for both grouped and ungrouped data. 	
28	8/3 – 12/3 (6)	<p>9.5 Comparing Dispersions Using Appropriate Measures</p> <p>9.6 Applications of Standard Deviation</p>	<ul style="list-style-type: none"> ● Use appropriate measures to compare the dispersions of different sets of data. ● Understand the applications of standard deviation to real-life problems involving standard scores and normal distribution. 	
29	15/3 – 19/3 (2)	<p>9.7 Effects of Data Change on Measures of Dispersion</p>	<ul style="list-style-type: none"> ● Explore the effects on the measures of dispersion subject to the following conditions: <ul style="list-style-type: none"> - Adding a common constant to each datum of the set of data - Multiplying each datum of the set of data by a common constant - Removing a datum from a set of data ● - Adding a datum to a set of data 	
30	22/3–26/3 (1)	Experiential Learning Week		
31	29/3–2/4 (0)	Easter Holiday		
32	5/4 – 9/4 (3)	<p>Ch10 Permutation and Combination</p> <p>10.1 Basic Principles of Counting</p>	<ul style="list-style-type: none"> ● Understanding the addition rule and multiplication rule in the counting principle. ● Solve problems by applying the addition rule and multiplication rule. 	

		10.2 Permutation		
33	12/4- 16/4 (6)	10.2 Permutation (Con't) 10.3 Combination	<ul style="list-style-type: none"> ● Understand the factorial notation. ● Understand the notation and concept of permutation. ● Solve problems on the permutation of distinct objects without repetition. 	
34	19/4 – 23/4 (6)	10.3 Combination (Con't)	<ul style="list-style-type: none"> ● Understand the notation and concept of combination. ● Solve problems on the combination of distinct objects without repetition. 	
35	26/4 – 30/4 (6)	Ch11 More about Probability 11.1 Set Language 11.2 Using Set Language in Probability 11.3 Addition Law of Probability	<ul style="list-style-type: none"> ● Recognize the notations of sets. ● Use Venn diagrams to represent sets and their elements. ● Recognize the set notations including union, intersection and complement. ● Understand the concepts of sample spaces and events. ● Apply the concepts of sets to find probabilities. ● Understand the concept of mutually exclusive events. ● Understand the addition law of probability. ● Understand the concept of complementary events. ● Apply the addition law of probability to real-life problems. 	
36	3/5 – 7/5 (6)	11.4 Multiplication Law of Probability for Independent Events 11.5 Conditional Probability and Multiplication Law of Probability for Dependent Events	<ul style="list-style-type: none"> ● Understand the concept of independent events. ● Understand the multiplication law of probability for independent events. ● Apply the multiplication law of probability to real-life problems. ● Understand the concept of dependent events. ● Understand the concept of conditional probability and its notation. ● Understand the multiplication law of probability for dependent events. 	
37	10/5 – 14/5 (6)	11.6 Using Permutation and Combination to Solve Probability Problems	<ul style="list-style-type: none"> ● Apply the multiplication law of probability to real-life problems. ● Use permutation and combination to solve probability problems. 	

38	17/5 – 21/5 (4)	S6 Ch1 Arithmetic and Geometric Sequences 1.1 Review on Sequences Arithmetic Sequences	<ul style="list-style-type: none"> ● Understand the concept of the general term of a sequence. ● Understand the concept, the general term and the properties of an arithmetic sequence. 	
39	24/5 – 28/5 (6)	1.2 Geometric Sequences Problems Involving Arithmetic and Geometric Sequences	<ul style="list-style-type: none"> ● Understand the concept, the general term and the properties of a geometric sequence. ● Able to solve practical problems involving arithmetic or geometric sequences. 	
40	31/5–4/6 (6)	Revision (Ch1–10)		
41	7/6–11/6 (4)	Revision (Ch1–10)		
42	15/6–18/6 (0)	Final Exam		
43	21/6–24/6 (4)	Final Exam		
44	28/6–30/6 (3)	Paper Checking		

4. Formative Assessment Modes

We may assess our students’ learning in the following modes:

- Discussions and presentations
- Projects
- Poster walks
- Peer teaching

5. Summative Assessments

Tests and examination will be conducted during the year to judge the extent of students’ learning. The purpose is to grade or certify students, evaluate their progress or to find out the effectiveness of a curriculum.

Assessment	Format		Mark Distribution	Time
Mid-term Assessment	Section A: MC Section B: Short questions Section C: Conventional questions		100	1 hr 45 mins
Final Exam	Paper 1	Section A1: Short questions	35	2 hrs 15 mins
		Section A2: Short questions	35	
		Section B: Conventional questions	35	
	Paper 2	Section A: MC Section B: MC	30 15	1 hr 15 mins

Weighting of Component Parts:

Term	Assessment item	1 st term		2 nd term		Final Assessment
		CA	SA	CA	SA	
1 st term	Homework/ Section Quizzes	20%	–	–	–	30%
	Chapter Tests	80%	–	–	–	
	Mid-term Assessment	–	100%	–	–	10%
2 nd term	Homework/ Section Quizzes	–	–	20%	–	30%
	Chapter Tests	–	–	80%	–	
	Final Exam Paper 1	–	–	–	65%	30%
	Final Exam Paper 2	–	–	–	35%	
Total		100%	100%	100%	100%	100%

6. Grade Boundaries

Students’ attainment at different stages of the school year is reported in performance levels. The mark ranges for the different performance levels are as follows.

Performance level	Mark Range
5**	93 above
5*	88-92
5	80-87
4	65-79
3	48-64
2	35-47
1^	Below 35

^Level 1 denotes performance not meeting the required standards of the school

For the descriptors of the performance levels, parents are advised to consult the information from the HKEAA at

https://www.hkeaa.edu.hk/DocLibrary/HKDSE/Subject_Information/math/math-compulsory-level-descriptors-e.pdf

7. Course Materials

(Book 5A) Mathematics in Action 5A (2nd Edition) – Longman Hong Kong Education.

(Book 5B) Mathematics in Action 5B (2nd Edition) – Longman Hong Kong Education.

(Book 6A) Mathematics in Action 6A (2nd Edition) – Longman Hong Kong Education.

DSE Pre-Training Mathematics (Compulsory Part) Section A

MCQ Fast-track Course Mathematics (Compulsory Part)

Mathematics Classwork Book

Mathematics Homework Book

Mathematics Folder

Calculator

8. Role of Parents at home

Parents are encouraged to talk to their child about their learning in class on a regular basis. They should also discuss the results obtained by their child to find out how well they are doing in their mathematics course.

LAW TING PONG SECONDARY SCHOOL
S6 MATHEMATICS 2020 – 21
Course Outline

1. Introduction to the Syllabus

The Department of Mathematics at LTPSS strives to develop students' mathematical knowledge, skills and concepts that can facilitate their future development in various aspects. Our syllabus aims to provide content knowledge which serves as a means to develop students' thinking abilities and foster students' generic skills and positive attitudes towards mathematics learning.

2. Learning Objectives

The S6 syllabus aims to:

2.1. Knowledge Domain

All HKDSE domain required by HKEAA

2.2. Skill Domain

Develop the following skills and capabilities:

- conceptualize inquire
- reasoning skills
- formulate
- solve problems mathematically
- numeracy
- presentation skills

2.3. Attitude Domain

Foster the attitudes to be:

- aspiring to higher academic performance
- self-regulated
- reflective
- perseverant

3. Syllabus Details

Week	Delivery Schedule	Chapter / Topic
1	1/9– 4/9 (1)	Administration work
2	7/9 – 11/9 (6)	Rational and irrational numbers Using percentages
3	14/9 – 18/9 (6)	Rates, ratios and proportions Linear equations in one unknown
4	21/9 – 25/9 (6)	Linear equations in two unknowns Laws of integral indices
5	28/9 – 2/10 (4)	Polynomials Identities
6	5/10 – 9/10 (6)	Linear inequalities in one unknown Arc lengths and areas of sectors
7	12/10 – 16/10 (6)	Angles and parallel lines Polygons
8	19/10 – 23/10 (6)	Congruent and Similar triangles Centres of triangles

9	26/10 – 30/10 (4)	Pythagoras' theorem Trigonometry
10	2/11 – 6/11 (6)	Measures of central tendency Probability
11	9/11 – 13/11 (0)	Term Break
12	16/11 – 20/11 (6)	Quadratic equations in one unknown Functions and graphs
13	23/11 – 27/11 (6)	Exponential and logarithmic functions More about polynomials
14	30/11 – 4/12 (6)	More about equations Variations
15	7/12 – 11/12 (5)	Arithmetic and geometric sequences and their summations Inequalities and linear programming
16	14/12 – 18/12 (6)	More about graphs of functions Equations of straight lines
17	21/12 – 25/12 (0)	Basic properties of circles Loci
18	28/12 – 1/1 (0)	Christmas and New Year Holidays
19	4/1 – 8/1 (6)	Equations of circles More about trigonometry
20	11/1 – 15/1 (6)	Permutations and combinations More about probability
21	18/1 – 22/1 (6)	Measures of dispersion
22	25/1 – 29/1 (0)	Final Examination
23	1/2 – 5/2 (0)	Final Examination

24	8/2 –10/2 (0)	Final Examination
25	15/2 –19/2 (0)	Lunar New Year Holiday
26	22/2 –26/2 (6)	Paper checking
27	1/3 – 5/3 (6)	Review on exam technique in Paper 1
28	8/3 – 12/3 (6)	Review on exam technique in Paper 2
29	15/3 – 19/3 (3)	Overall review on exam technique

4. Formative Assessment Modes

We may assess our students’ learning in the following modes:

- Discussion and presentation
- Poster design
- Questions design
- Peer teaching

5. Summative Assessments

Examination will be conducted during the year to judge the extent of students’ learning. The purpose is to grade or certify students, evaluate their progress or to find out the effectiveness of a curriculum.

Assessment	Format		Mark Distribution	Time
Final Exam	Paper 1 (65%)	Section A1 SQ	35	2 hrs 15 mins
		Section A2 SQ	35	
		Section B LQ	35	
	Paper 2 (35%)	Section A MC	30	1 hr 15 mins
Section B MC	15			

Weighting of Component Parts

Assessment item	Weighting
Practice papers	40%
Final Examination	60%

6. Grade Boundaries

Students’ attainment at different stages of the school year is reported in performance levels. The mark ranges for the different performance levels are as follows.

Performance level	Mark Range
5*	88 or above
5	80-87
4	65-79
3	48-64
2	35-47
1^	Below 35
^Level 1 denotes performance not meeting the required standards of the school	

For the descriptors of the performance levels, parents are advised to consult the information from the HKEAA at https://www.hkeaa.edu.hk/DocLibrary/HKDSE/Subject_Information/math/math-compulsory-level-discriptors-e.pdf

7. Role of Parents at home

Parents are encouraged to talk to their child about their learning in class on a regular basis. They should also discuss the results obtained by their child to find out how well they are doing in their mathematics course.