Mathematics Syllabus

Form 3 Track 2

Contents

Form III – Track 2: Number and Applications							
Formula One Maths C1							
Ch	Mod		**Learning Outcome:**	Pg	Level	SEC	Notes
1	NA1	i.	Convert units of length/weight/capacity to smaller units and vice versa.	2		Core	• Restricted to metric units.
	NA1	ii.	Solve simple problems involving time.				
	NA1	iii.	Understand the notion of speed.				• Through direct proportion.
	NA1	iv.	Work out the distance/time given the speed and time/distance.				• Through direct proportion.
5	NN2	i.	Write ratios in their simplest form.	46		Core	
	NN2	ii.	Find missing quantities in a given ratio.				
	NN2	iii.	Use the ratio notation to compare two or more quantities.				
	NN2	iv.	Divide quantities in a given ratio.				
	NN2	v.	Use scale to understand similarity.				• Use linear measurements only.
	NN2	vi.	Interpret the scale on plans.				
8	NN3	i.	Add/subtract directed numbers.	74		Core	
	NN3	ii.	Multiply/divide directed numbers.				
10	NA4	i.	Find the percentage of a quantity.	94		Core	
	NA4	ii.	Work out the percentage increase/decrease.				
	NA4	iii.	Solve problems involving percentage increase and decrease.				
13	NN5	i.	Add and subtract fractions with different denominators.	116		Core	• Students should know the meaning of the following terms: 'common denominator', 'equivalent' and 'cancel'.
	NN5	ii.	Change improper fractions to mixed numbers and vice versa.				
	NN5	iii.	Multiply fractions by other fractions.				
17	NN6	i.	Write ordinary numbers in standard form and vice versa.	152		Core	• Learn to use the 'EXP' key on the calculator.
19	NN6	ii.	Choose reasonable approximations.	168		Core	• Learn to use the calculator appropriately and efficiently while at the same time employing suitable procedures to check the result displayed on the calculator.
	NN6	iii.	Carry out rough estimates to check accuracy.				• Apply appropriate checks of accuracy (E.g. working the problem backwards from its solution or make approximations to check the reasonableness of the result).
25	NN7	i.	Investigate the total cost of a project.	218		Core	E.g. Part time job, Cost of a holiday, an ideal room.
26	NN7	ii.	Use quadrilaterals and rectangles in investigations.	225			

Form III – Track 2: Algebra (i)							
Formula One Mathematics C1							
Ch	Mod		**Learning Outcome:**	Pg	Level	SEC	Notes
2	AL1	i.	Use letter symbols to represent unknown numbers.	12		Core	• Students should know the meaning of the following terms: variable, expression and simplify.
	AL1	ii.	Simplify algebraic expressions by collecting like terms.				
	AL1	iii.	Understand that a^2 means $a \times a$.				
6	AL2	i.	Solve linear equations in one unknown involving more than two operations.	54		Core	
	AL2	ii.	Solve problems by forming linear equations in one unknown.				• involving more than two operations.
9	AL3	i.	Describe simple patterns verbally.	80		Core	
	AL3	ii.	Use a number machine to generate a linear sequence.				
	AL3	iii.	Write down the rule that a number machine is using.				
	AL3	iv.	Generate terms of a sequence given the rule (formula) for the n^{th} term and the value of n.				
	AL3	v.	Generate number patterns on a spreadsheet.				• Students should be given opportunities to use a spreadsheet to generate sequences of numbers that they can describe both verbally and algebraically.
12	AL4	i.	Multiply a bracket by a single term.	110		Core	
	AL4	ii.	Factorise fully expressions containing a numerical common factor.				• Understand the words: expand and factorise.
14	AL5	i.	Mark points using an ordered pair of numbers in any quadrant.	124		Core	
	AL5	ii.	Generate and plot coordinate pairs that satisfy a linear rule.				E.g. from a number machine.
	AL5	iii.	Plot straight line graphs.				• Students are given opportunities to use a spreadsheet and/or a CAS to explore algebraic relationships graphically. For example, by graphically representing the relationship of the form $y = mx + c$, students appreciate that by changing the values of m and/or c, the gradient and/ or y intercept of the line is changed accordingly.
	AL5	iv.	Use straight-line graphs to find the value of one coordinate given the other.				
	AL5	v.	Understand the terms gradient and y intercept.				
	AL5	vi.	Understand, interpret and calculate the gradient of a line from the coordinates of two points on the line.				
18	AL6	i.	Evaluate practical formulae by substituting variables with numbers.	162		Core	• Students are encouraged to interpret the results.
	AL6	ii.	Change the subject of the formula involving two operations.				• The formulae have to involve linear equations.

Form III – Track 2: Algebra (ii)						
Formula One Maths C1						
Ch	Mod	**Learning Outcome:**	Pg	Level	SEC	Notes
20	AL7	i. Draw and interpret linear and non-linear graphs arising from real-life situations.	176		Core	E.g. Distance/time graphs; conversion graphs of height against age; currency etc. • Exclude the interpretation of the gradient.
		ii. Use distance/time graph to find distance/ time/speed.				E.g. calculating average speed.

Form III – Track 2: Shape, Space and Measurement (i)							
Formula One Maths C1							
Ch	Mod		**Learning Outcome:**	Pg	Level	SEC	Notes
3	GM1	i.	Find the volume of compound shapes and prisms made up of cuboids.	28		Core	
	GM1	ii.	Find the total surface area of solids made up of cuboids.				
5	GG2	i.	Understand the notion of similar shapes.	48		Core	• Restrict to ratio of linear measurements.
7	GG3	i.	Derive the sum of the exterior/interior angles of a polygon.	64		Core	• LOGO provides an ideal environment for students to experience angle as a measure of turn, in both a clockwise and an anti-clockwise direction. Besides, turtle geometry gives students an opportunity to manipulate angles of different sizes. • Dynamic Geometry Software can help students discover the properties of vertically opposite angles, angles at a point and angles on a straight line. • By drawing simple shapes such as squares, rectangles and triangles using simple LOGO commands such as FD, BK, RT, LT and REPEAT, students are given the opportunity to reflect upon the properties of these shapes.
	GG3	ii.	Solve problems involving angles of polygons.				
	GG3	iii.	Identify parts of a circle: chord and sector.				
	GG3	iv.	Inscribe a regular polygon in a circle with given radius for integral values of $\frac{360^\circ}{n}$.				
11	GM4	i.	Identify parts of a circle: arc.	104		Core	• Revise: centre, radius, diameter and circumference.
	GM4	ii.	Understand the notion of π, as a ratio of the circumference to the diameter.				
	GM4	iii.	Deduce and use of formulae: $C = \pi d$ and $C = 2\pi r$.				
	GM4	iv.	Deduce and use the formula for the area of a circle: $A = \pi r^2$ by dividing it into sectors.				• Build a parallelogram and use: Area = base × perpendicular height for the parallelogram thus obtained.
	GM4	v.	Find the area of composite shapes: dividing them into simple shapes including circles.				

Form III- Track 2: Shape, Space and Measurement (ii)							
Formula One Maths C1							
Ch	Mod		**Learning Outcome:**	Pg	Level	SEC	Notes
15	GG5	i.	Draw simple scale drawings and solve problems involving angles of elevation and depression.	136		Core	
	GG5	ii.	Use ruler and compasses only to draw the perpendicular bisector of a line segment.				
	GG5	iii.	Use ruler and compasses only to draw the perpendicular at a point on a line.				
	GG5	iv.	Use ruler and compasses only to draw angles of 60° and 90°.				
	GG5	v.	Use ruler and compasses only to draw the bisector of an angle.				• Apply the bisector of an angle method to draw angles of 30º and 45º.
	GG5	vi.	Draw the inscribed regular hexagon in a given circle using ruler and compasses only.				• For constructions of regular polygons see also Chapter 7 page 70 – 73.
				184		Core	
	GG6	i.	Use the main eight compass directions.				• For three figure bearings exercises refer also to FOM Maths B Gold Page 26.
	GG6	ii.	Express the eight main compass directions as three-figure bearings				

Form III – Track 2: Data Handling							
Formula One Maths C1							
Ch	Mod		**Learning Outcome:**	Pg	Level	SEC	Notes
4	DH1 DH1 DH1	i. ii. iii. .	Compile and interpret frequency tables for un/grouped discrete data. Compile and interpret frequency tables for un/grouped continuous data. Interpret bar charts and pie charts.	32		Core	Students: • Use spreadsheets to display and analyse the collected data. • Learn not only how to compute statistics but also understand its uses and drawbacks. • Learn to group data in a meaningful way. • Examples for class intervals: $10 - 19, 20 - 29, \ldots.$ $0 \leq t < 5, 5 \leq t < 10, \ldots$
16	DH2	i.	Understand, compute and interpret the mean, median, mode and range of a set of discrete/continuous ungrouped data only.	144		Core	
22	DH3 DH3 DH3 DH3	i. ii. iii. iv.	Understand and work out the probability of an event. Understand that the probabilities of all mutually exclusive outcomes add up to 1. Compile and use a possibility space. Work out the probability from a frequency table.	194		Core	• Questions involving playing cards will not be set in the examination.