

MATHEMATICS SYLLABUS

Year 10 Track 2

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Year 10 – Track 2: Number and Applications (i)

SMP Interact Mathematics for Malta : Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
6	NN28	i. Recognise multiples, factors, prime numbers. Find and use least common multiples.	49		Core	<ul style="list-style-type: none"> Estimate and use a calculator to evaluate powers and roots. Revise rounding to a given number of decimal places. Estimate a result by rounding to one significant figure. Know that some fractions can be written as recurring decimals. Understand that fractions whose denominators are multiples of only 2 and/or 5 are non-recurring fractions
	NN28	ii. Use index notation and the rules for multiplying powers.				
9	NN28	iii. Round numbers to a given number of significant figures.	68			
11	NN28	iv. Add and subtract mixed numbers.	93			
	NN28	v. Change decimals to fractions and vice versa.				
15	NA29	i. Understand and use the elementary ideas of direct and inverse proportion. ii. Calculate an unknown quantity from quantities that vary in direct or inverse proportion.	129		Core	<ul style="list-style-type: none"> For inverse proportion use additional exercises. See FOM C2 Pg 78
23a	NN30	i. Use and interpret positive and negative integer indices, including zero.	195		Core	<p>E.g. $7^8 \times 7^{-5} = 7^3$ $(-1/3)^6 \div (-1/3)^2 = (-1/3)^4$ $(2^3)^5 = 2^{15}$</p> <ul style="list-style-type: none"> Include positive and negative powers of 10 and the use of a calculator.
	NN30	ii. Use the rules for multiplying and dividing integer powers with the same number base.				
40	NN30	iii. Write ordinary numbers in standard form and vice versa.	345			
32	NA31	i. Determine the speed of an object given the distance and time.	274		Core	<ul style="list-style-type: none"> Include average speed as the rate of change between the total distance travelled and the total time taken. Include velocity-time graphs but exclude: the interpretation of the gradient as the acceleration of an object; the interpretation of the area as the distance travelled by an object.
	NA31	ii. Determine the distance travelled by an object given the speed and time.				
	NA31	iii. Determine the time taken by an object given the distance and speed.				
	NA31	iv. Read and interpret travel graphs.				

Year 10 – Track 2: Number and Applications (ii)

SMP Interact Mathematics for Malta : Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
33	NN32	i. Understand that the reciprocal of a number is its multiplicative inverse.	285		Core	<ul style="list-style-type: none"> • For revision exercises use chapters 11 and 17. • Use mixed numbers for multiplication and division.
	NN32	ii. Multiply and divide one fraction by another fraction.				
37	NA33	i. Divide a quantity in a given ratio.	314		Core	<ul style="list-style-type: none"> • Include problems on ratios.
	NA33	ii. Write a ratio in the form $1 : k$ or $k : 1$				
36	NA33	iii. Understand and use simple map ratios.	308			
	NA33	iv. Work out the map distance given the scale and the actual distance.				
	NA33	v. Work out the actual distance given the scale and the map distance.				
	NA33	vi. Determine the map scale from map and actual distances.				

Year 10 - Track 2: Algebra (i)

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
2	AL23	i. Simplify algebraic fractions with numerical denominators.	12		Core	<ul style="list-style-type: none"> To include the use of brackets.
8	AL24	i. Use letter symbols to represent unknown quantities in a formula.	63		Core	<ul style="list-style-type: none"> Students should be able to create a formula from pictorial data or data presented in tabular form.
	AL24	ii. Change the subject of the formula which includes two operations.				
12	AL25	i. Evaluate practical formulae by substituting variables with numbers.	100		Core	<ul style="list-style-type: none"> E.g formulae for area, volume and temperature. Students should be given opportunities to use a spreadsheet to evaluate formulae.
14	AL26	i. Extend patterns and sequences of numbers.	119		Core	<ul style="list-style-type: none"> Students should be given opportunities to use a spreadsheet to generate sequences of numbers that they can describe both verbally and symbolically. <p>E.g. Find the 4th term given that the n^{th} term is $2n + 5$.</p>
	AL26	ii. Generate terms of a sequence using term definitions of the sequence.				
	AL26	iii. Use expressions to describe the n^{th} term of a simple sequence.				
	AL26	iv. Recognize geometric and number patterns.				
19	AL27	i. Simplify algebraic expressions by collecting like terms.	167		Core	<ul style="list-style-type: none"> To include simple use of brackets. <p>E.g. $\frac{2x}{3} \pm \frac{3(x+1)}{2}$</p>
	AL27	ii. Add/subtract algebraic fractions with numerical denominators.				
	AL27	iii. Solve linear equations in one unknown that involve two or more operations.				

Year 10 - Track 2: Algebra (ii)

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:		Pg	Level	SEC	Notes
21	AL28	i.	Generate and plot coordinate pairs that satisfy a linear rule.	176		Core	
	AL28	ii.	Use straight-line graphs to find the value of one coordinate given the other.				
	AL28	iii.	Draw quadratic graphs and identify maxima/minima.				
	AL28	iv.	Use quadratic graphs to find the value of one coordinate(s) given the other.				
23b	AL29	i.	Use and interpret positive and negative integer indices including zero.	195		Core	
	AL29	ii.	Use the index laws in simple instances.				
	AL29	iii.	Solve simple exponential equations by inspection.				E.g. $3^x = 81$, $2^x = \frac{1}{16}$
28	AL30	i.	Simplify algebraic expressions by collecting, cancelling and multiplying terms of an expression.	240		Core	
	AL30	ii.	Factorise expressions completely by taking out a common factor.				
	AL30	iii.	Multiply a single term over a bracket.				
	AL30	iv.	Use letter symbols to represent unknown quantities in a formula.				E.g Formulae for the surface area and volume of composite shapes and solids.

Year 10 – Track 2: Shape, Space and Measurement (i)

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
1	GG21 GG21 GG21 GG21 GG21	i. Demonstrate Pythagoras Theorem through drawing and measurement. ii. Understand a proof of Pythagoras Theorem. iii. Use Pythagoras theorem to find the side of a right-angled triangle given the other two sides. iv. Identify Pythagorean triads. v. Use the converse of Pythagoras Theorem.	4		Core	• See also FOM C2 pg 51.
10	GM22 GM22 GM22 GM22 GM22 GM22 GM22 GM22	i. Work out the area of a parallelogram and a triangle. ii. Work out the area and perimeter of composite shapes. iii. Derive and use the formula to find the area of the trapezium by dividing it into two triangles. iv. Use the formula to find the area of a triangle to find the base and height. v. Use the formulae $C = \pi d$ and $C = 2\pi r$ to find the circumference of a circle and $A = \pi r^2$ to find the area of a circle. vi. Use formulae for the circumference and area to find the radius/diameter. vii. Work out the length of an arc and the area of a sector as fractions of a circle. viii. Work out the area of composite flat shapes by dividing them into simple shapes including circles.	74		Core	• Refer to FOM B2 Pg 142
16	GM23 GM23 GM23 GM23 GM23	i. Solve problems involving the volume of a prism. ii. Use $V = Ah$ to find volume/area/height of a prism. iii. Use the formula $V = \pi r^2 h$ to find the volume, radius or height of a cylinder. iv. Derive and use the formulae for the surface area of a cylinder. v. Use appropriate units for area and volume.	136		Core	• Curved and total surface area. • Convert from cm^2 to m^2 , cm^3 to m^3 and vice versa.
25	GG24 GG24	i. Recognise and use the relationship between corresponding, alternate and interior angles in relation to parallel lines. ii. Show that two lines are parallel.	220		Core	• When two alternate angles are equal. When two corresponding angles are equal. When two interior angles are supplementary.

Year 10 – Track 2: Shape, Space and Measurement (ii)

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
36	GG25	i. Draw simple scale drawings from given data and interpret scale drawings.	308		Core	
	GG25	ii. Use three-figure bearings, measured clockwise from the north to describe the position of one point from another.				
	GG25	iii. Find the distance/bearing of one object from another by making a scale drawing.				
42a	GG26	i. Understand the tangent function as the ratio between the opposite and the adjacent side of an angle in a right-angled triangle.	366		Core	
	GG26	ii. Use the tangent ratio to find: a. the opposite side given an angle and its adjacent side; b. the adjacent side given an angle and its opposite side; c. the angle given two sides other than the hypotenuse.				
45	GG27	i. Understand a proof that the angle sum of a triangle is 180° .	393		Core	
	GG27	ii. Understand a proof that the exterior angle of a triangle is equal to the sum of the interior angles at the other two vertices.				
	GG27	iii. Understand a proof that the angle sum of a quadrilateral is 360° .				
	GG27	iv. Solve problems involving the angles of triangles.				
	GG27	v. Understand and use the properties of the square, rectangle, parallelogram, trapezium, rhombus and kite.				
	GG27	vi. Calculate and use the sums of the interior and exterior angles of regular and irregular polygons.				<ul style="list-style-type: none"> Derive and use a formula, such as $(2n - 4)$ right angles or $180(n - 2)$, for the sum of the interior angles of a polygon with n sides.
	GG27	vii. Solve problems involving angles of polygons.				

Year 10 – Track 2: Shape, Space and Measurement (iii)

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
49a	GG28	i. Understand the sine and cosine function as the ratio between pairs of sides of a right-angled triangle.	433		Core	<ul style="list-style-type: none"> One side of which is the hypotenuse.
	GG28	ii. Use the sine and cosine ratios to find: <ul style="list-style-type: none"> a. the opposite side given an angle and the hypotenuse. b. the adjacent side given an angle and the hypotenuse. c. an angle given the opposite side or the adjacent side and the hypotenuse. d. the hypotenuse given an angle and the opposite or the adjacent side. 				
53		Transform points and shapes using:	472		Core	<ul style="list-style-type: none"> Use a given column vector. Use $y = \pm c$, $x = \pm c$, $y = \pm x$, as mirror lines. Use angles of rotation in multiples of 90°. Use positive integers or fractions as scale factor. Recognise that reflections, rotations and translations preserve length and angle so that any figure is congruent to its image under any of these transformations. Recognise that enlargements preserve angle and not length. Understand and use the effect of enlargement on the perimeter of 2D shapes.
	GG29	i. Translation.				
	GG29	ii. Reflection.				
	GG29	iii. Rotation.				
	GG29	iv. Enlargement.				
16	GM30	i. Find the surface area of simple compound solid shapes involving cubes, cylinders and/or pyramids.	143		Core	

Year 10 – Track 2: Data Handling

SMP Interact: Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
5	DH10	i. Construct and interpret information tables.	36		Core	
	DH10	ii. Understand, compute and interpret the mean, mode, median and range of a set of discrete/continuous ungrouped data only.				
	DH10	iii. Draw a histogram (<i>frequency diagram</i>) with equal intervals from an un/grouped frequency table.				
34	DH11	i. Understand and work out the probability of an event.	289		Core	<ul style="list-style-type: none"> • Questions involving playing cards will not be set in the examination.
	DH11	ii. Work out the probability of an event by experiment.				
	DH11	iii. Work out the probability of an event from a frequency table.				
	DH11	iv. Compile a possibility space.				
	DH11	v. Work out the combined probability outcomes of two independent events.				
						E.g. Tossing a coin and a dice using a possibility space.