

MATHEMATICS SYLLABUS

Year 11 Track 2

Contents

Pages

- | | |
|---|-------|
| • <u><i>Number and Applications</i></u> | 2 |
| • <u><i>Algebra</i></u> | 3 - 4 |
| • <u><i>Shape Space and Measurement</i></u> | 5 - 6 |
| • <u><i>Data Handling</i></u> | 7 |

Year 11 - Track 2: Number and Applications

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
44	NA34	i. Solve problems involving percentage increase and decrease.	384		Core	E.g. profit and loss, discount, simple interest, stocks, tax and exchange rate. • As a preview see also Ch 13 p.108.
	NA34	ii. Increase/decrease a quantity using a percentage multiplier.				
	NA34	iii. Calculate the percentage increase/decrease of a quantity.				• To include finding an increase/decrease in a quantity as a percentage.
48	NA35	i. Successive percentage changes.	426		Core	• Do not to include the compound interest formula. E.g. to find the cost price given the selling price and percentage profit.
	NA35	ii. Carry out calculations involving reverse percentages.				
27	NA35	iii. Solve problems on personal and household finance.	237			• Include earnings and insurance.
40	NA36	i. Calculate with numbers in standard form, with and without the use of a calculator.	345		Core	• Include problems.

Year 11 - Track 2: Algebra (i)

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod		Learning Outcome:	Pg	Level	SEC	Notes
35	AL31	i.	Interpret and understand rates of change as the gradient of a line.	299		Core	<ul style="list-style-type: none"> To include negative gradients. E.g. distance-time graphs, conversion graphs and the interpretation of non-linear graphs.
	AL31	ii.	Plot and interpret graphs of simple linear functions arising from real-life situations.				
	AL31	iii.	Calculate the gradient of a line from the coordinates of two points on the line.				
39	AL32	i.	Generate a sequence of ordered pairs of numbers and plot them to produce a straight-line graph.	335		Core	<ul style="list-style-type: none"> Students should be given opportunities to use a spreadsheet and/or a CAS to explore algebraic relationships both symbolically and graphically. For example, by representing the relationship of the form $y = mx$ graphically using a CAS, pupils can appreciate that by changing the values of m, the gradient of the line changes accordingly. Use $y = mx + c$ to draw quick sketches of lines.
	AL32	ii.	Understand the relationship between the equation of a straight-line and its gradient and y intercept.				
	AL32	iii.	Derive the values of m and c from the graph and write the equation of a line in the form $y = mx + c$ from its graph.				
	AL32	iv.	Use the fact that parallel lines have equal gradient to decide when two lines are parallel.				
	AL32	v.	Rearrange an equation in the form $y = mx + c$.				
41	AL33	i.	Solve linear equations in one unknown involving more than two operations.	357		Core	<ul style="list-style-type: none"> Include the use of brackets and simple fractions with numerical denominators. By forming equations from shapes and by forming equations from words.
	AL33	ii.	Solve problems leading to the solution of linear equations in one unknown.				
46	AL34	i.	Solve two simultaneous linear equations algebraically.	401		Core	
	AL34	ii.	Solve problems leading to the solution of simultaneous linear equations.				
	AL34	iii.	Solve two simultaneous linear equations graphically.				

Year 11 - Track 2: Algebra (ii)

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod		Learning Outcome:	Pg	Level	SEC	Notes
47	AL35	i.	Simplify fractions by taking out the common factor and cancelling.	423		Core	<ul style="list-style-type: none"> To include common factors only
50	AL36	i.	Change the subject of the formula that includes squares and square roots.	447		Core	<ul style="list-style-type: none"> Include $I = \frac{PTR}{100}$ to find P, T and R. E.g. $f(x) = 3x - 5$
	AL36	ii.	Change the subject of the formula when the same letter appears more than once.				
	AL36	iii.	Form formulae and change the subject.				
	AL36	iv.	Change the subject of the formula that involves many letters.				
	AL36	v.	Understand and use function notation.				

Year 11 – Track 2: Shape, Space and Measurement (i)

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
38	GG31 GG31 GG31	i. Understand the notion of similar shapes. ii. Prove triangles similar by showing that: <ol style="list-style-type: none"> The corresponding angles are equal; the corresponding sides of each triangle are in the same ratio which is equal to the scale factor (k) of the enlargement; there is one pair of equal angles and the sides containing these angles are in the same ratio. iii. Solve problems involving similarity and length of sides using the scale factor notion.	322		Core	<ul style="list-style-type: none"> Recognise that enlargements preserve angle and not length. Understand and use the effect of enlargement on the perimeter of 2D shapes. Appreciate that any two circles and any two squares are mathematically similar, whereas in general, two rectangles are not.
42b	GG32	i. Use the tangent ratio to solve practical problems.	366		Core	<ul style="list-style-type: none"> To include isosceles triangles and other shapes. To include angles of elevation and depression and bearings.
49b	GG33 GG33	i. Use the sine and cosine ratios to solve practical problems. ii. Use trigonometric ratios to solve problems involving bearings and angles of elevation and depression.	433		Core	<ul style="list-style-type: none"> To include isosceles triangles and other shapes.
54	GG34 GG34 GG34 GG34 GG34 GG34	Use ruler and compasses only to draw: <ol style="list-style-type: none"> triangles, rectangles, regular hexagons and circles; the perpendicular bisector of a line segment; the perpendicular from a given point to a line; the bisector of an angle; angles of 90°, 60°, 30°, 45°; Understand and apply the following locus properties in two dimensions in practical situations: <ol style="list-style-type: none"> the locus of points which are at a fixed distance from a given point; the locus of points which are equidistant from two given points. 	485		Core	

Year 11 – Track 2: Shape, Space and Measurement (ii)

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
60	GG35	i. Understand the terms secant, tangent, arc, sector and segment of a circle.	535		Core	<ul style="list-style-type: none"> It follows that equal arcs subtend equal angles at the centre and at the circumference.
	GG35	ii. Understand that in any circle: <ul style="list-style-type: none"> a. the angles in the same segment are equal; b. the angle in a semicircle is a right angle; c. the angle subtended by an arc at the centre is twice the angle subtended by the arc at the circumference; d. the opposite angles of a cyclic quadrilateral are supplementary; e. the exterior angle of a cyclic quadrilateral is equal to the interior opposite angle; f. the angle between the tangent and the radius at the point of contact is a right angle. 				
	GG35	iii. Give reasons to justify the use of the above angle facts in simple riders.				
63	GG36	i. Understand the notion of congruent shapes.	556		Core	<ul style="list-style-type: none"> Use RHS , SSS, SAS and ASA/AAS to prove that triangles are congruent. Appreciate that reflection, rotations and translations preserve length and angle, so that any figure is congruent to its image under any of these transformations.
	GG36	ii. Appreciate that all congruent shapes are similar but similar shapes are not necessarily congruent.				
	GG36	iii. Solve problems involving congruency.				
26	GG37	i. Understand through congruent triangles that: <ul style="list-style-type: none"> a. the line from the centre of a circle to the midpoint of a chord is perpendicular to the chord. b. tangents drawn to a circle from a point outside the circle are equal. c. equal chords are equidistant from the centre. 	231		Core	<ul style="list-style-type: none"> See also exercises in Ch 63 on pages 558-561. Appreciate that the converse is also true. <ul style="list-style-type: none"> Appreciate that the converse is also true.

Year 11 – Track 2: Data Handling

SMP Interact Mathematics for Malta: Intermediate Level

Ch	Mod	Learning Outcome:	Pg	Level	SEC	Notes
18	DH12	i. Draw Pie Charts from real data.	158		Core	• Use percentages.
52	DH13	i. Understand, compute and interpret the mean, mode, median and range of a set of discrete/continuous ungrouped data only.	462		Core	