سلطنة عمان
وزارة التربية والتعليم
المديرية العامة للمدارس الخاصة
دائرة برامج ومناهج المدارس الخاصة
قسم المناهج التعليمية

رؤية عمان 2040

النشرة التوجيهية لمادة الرياضيات

المخرجات والمصادر التعليمية المعتمدة للمدارس الخاصة

برنامج ثنائي اللغة – للصفوف (11–12)

Mathematics Newsletter

Approved Educational Resources and Learning Outcomes for Private Schools

Bilingual Program Grades (11-12)

2025/2026

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الفهرس العام

General Index

الفصل الأول: الموجهات العامة

Section (1): General Guidelines

توفير المصادر التعليمية	▪ توفير نسخ أصلية من جميع المصادر التعليمية الموضحة في هذه النشرة التوجيهية لجميع الطلبة والمعلمين، مع مراعاة حقوق الطبع والملكية الفكرية في جميع استخدامات المصادر التعليمية.
الأهداف	▪ تحقيق المخرجات التعليمية للفصلين الدراسيين الأول والثاني للصفين الحادي عشر والثاني عشر الواردة في هذه الوثيقة.
التدريب	▪ تدريب المعلمين والذي يتعلق باستخدام المصادر التعليمية المعتمدة، يجب أن يكون ضمن خطط المدارس الخاصة للإنماء المهني، والمدارس هي الجهات المعنية بالتنسيق المباشر مع دور النشر أو عبر الموزعين المعتمدين حول توفير البرامج التدريبية لمعلميها.

Resources Provision	▪ To provide original copies of all the Resources for all students and teachers, and take in consideration the copyrights and intellectual properties in all uses of the educational recourses.
Outcomes	• To stick to "**Learning Outcomes**" during the two semesters of the academic year for both grades.
Training	▪ Teacher training related to the use of the selected coursebooks or learning resources should be part of all schools' commitment to the professional development of their teachers and should be made available to teachers by the schools either by direct contact the publishers or via their concerned distributers.

الفصل الثاني: الصف الحادي عشر

Section (2): Grade 11

الفهرس

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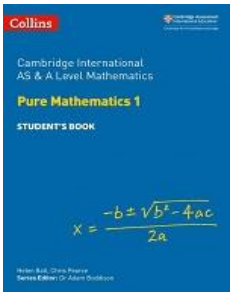
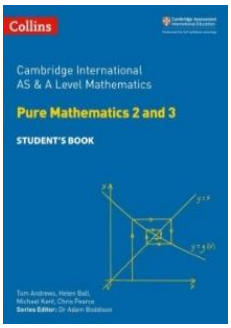
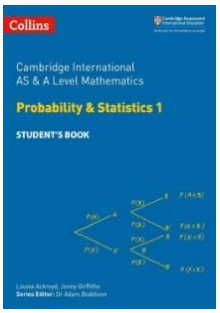
The Approved Resources and their ISBNs for Advance Math– Grade (11)

	Title	Publisher	ISBN	Book Cover
1	Cambridge International AS & A Level Mathematics Pure Mathematics 1 Student's Book	Collins	978-0-00-825773-6	
2	Cambridge International AS & A Level Mathematics Pure Mathematics 2&3 Student's Book	Collins	978-0-00-825774-3	
3	Cambridge International AS & A Level Mathematics Probability & Statistics 1 Student's Book	Collins	978-0-00-825776-7	
4	Cambridge International AS & A Level Mathematics Pure Mathematics 1, 2 & 3 Teacher's Guide - eBook	Collins	978-0-00-799018-4	Available online
5	Cambridge International AS & A Level Mathematics Probability & Statistics 1 Teacher's Guide - eBook	Collins	978-0-00-799019-1	Available online

Learning Outcomes of Advance Math– Grade (11)

Advance Math Grade 11 - Semester 1

Area	Reference Chapter	Objectives	No. of weeks
Algebra, Equations and Functions	Quadratics PM1*	- Carry out the process of completing the square for a quadratic polynomial $ax^2 + bx + c$ and use a completed square form. - Find the discriminant of a quadratic polynomial $ax^2 + bx + c$ and use the discriminant. - Solve quadratic equations in one unknown **by using completing square.** - Solve quadratic inequalities in one unknown. - Solve by substitution a pair of simultaneous equations of which one is linear and one is quadratic. - Recognize and solve equations in x that are quadratic in some function of x.	2
	Functions PM1*	- Understand the terms function, domain, range, one-one function, **many-one function**. - Identify the range of a given function in simple cases. - Determine whether a given function is one-one **or many-one in simple cases.** - Illustrate in graphical terms the relation between a one-one function and its inverse - Understand and use transformations of the graph of $y = f(x)$ given by $y = f(x) + a$, $y = f(x+a)$, $y = af(x)$, $y = f(ax)$ and simple combinations of these.	2
	Algebra PM2&3*	- Understand the meaning of $\|x\|$, sketch the graph of $y = \|ax + b\|$ and use relations such as: $\|a\| = \|b\| \Leftrightarrow a^2 = b^2$ and $\|x - a\| < b \Leftrightarrow a - b < x < a + b$ in the course of solving equations. - Divide a polynomial by a linear or quadratic polynomial and identify the quotient and remainder. - Use the factor theorem and the remainder theorem. - Recall an appropriate form for expressing rational functions in partial fractions and carry out the decomposition.	3
Calculus	Differentiation PM1*	- Understand the gradient of a curve as the limit of the gradients of a sequence of chords (Note: differentiation by using first principle not included) - Use the notation $\frac{dy}{dx}$ and $f'(x)$ for first derivatives	3

Area	Reference Chapter	Objectives	No. of weeks
		- Use the derivative of x^n together with multiples, sums and differences - Differentiate composite functions, using the chain rule - Locate stationary points and determine their nature - Identify increasing and decreasing functions - Apply differentiation to find gradients, tangents and normal - Use the notation $\frac{d^2y}{dx^2}$ and $f''(x)$ for second derivatives - Apply differentiation to rates of change	
Statistics	Representing of data P&S1*	- Choose suitable ways of presenting qualitative and quantitative raw data, discussing the advantages and disadvantages of your choice - Use discrete, continuous, grouped, and ungrouped data - Interpret, draw, and use stem-and-leaf diagrams, histograms, box-and-whisker plots (including outliers) and cumulative frequency diagrams - Calculate and use measures of central tendency: mean, median and mode - Calculate and use measure of variation: range, interquartile range and standard deviation - Work with grouped and ungrouped data when calculating the mean and standard deviation	2
Revision			1 (Suggested)

* PM1: Pure Mathematics 1
* PM2&3: Pure Mathematics 2&3
* P&S1: Probability & Statistics 1

Advance Math Grade 11 - Semester 2

Area	Reference Chapter	Objectives	No. of weeks
Geometry	Coordinate Geometry PM1*	- Find the equation of a straight line, given sufficient information. - Interpret and use any of the forms $y = mx + c$, $y - y_1 = m(x - x)$, $ax + by + c = 0$ in solving problems. - Use algebraic methods to solve problems involving lines. - Understand the relationship between a graph and its associated algebraic equation and use the relationship between points of intersection of graphs and solutions of equations.	1.5
Trigonometry	Circular Measure and Trigonometry PM1*	- Understand the definition of a radian and use the relationship between radians and degrees. - Use formulae for the arc length and sector area of a circle - Define the sine, cosine and tangent for any angle. - Sketch and use graphs of the sine, cosine and tangent functions for angles of any size. - Use the exact values of the sine, cosine and tangent of 30˚, 45˚, 60˚ and related angles. - Use two important identities connecting sin x ,cos x and tan x. - Define the principal values of inverse trigonometric relations. - Find the solutions of simple trigonometric equations.	2.5
Algebra	Series PM1*	- Expand expressions of the form $(a + b)^n$, where n is a positive integer. - Recognize arithmetic progressions and geometric progressions. - Use formulae for the nth term of an arithmetic progression or a geometric progression. - Use formulae for the sum of the first n terms of an arithmetic progression or a geometric progression. - Interpret and find the sum to infinity of a convergent geometric progression.	2
Calculus	Integration PM1*	- Understand integration as the reverse process of differentiation. - Integrate $(ax + b)^n$ for rational values of n (except -1), together with constant multiples, sums and differences. - Solve problems involving the evaluation of a constant of integration. - Evaluate definite integrals. - Find areas bounded by curves and the coordinate axes or between a curve and a line or between two curves. - Use definite integration to find a volume of revolution.	3
Probability	Probability, permutations and combinations P&S1*	- Solve problems involving permutations and combinations of a set of objects. - Model situations involving probability and explain any assumptions made. - Evaluate probabilities in simple cases.	3

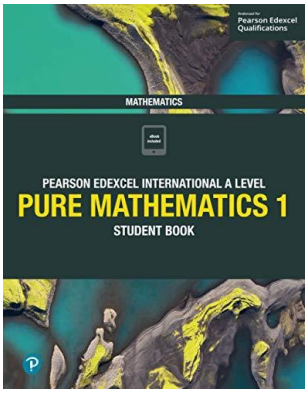
Area	Reference Chapter	Objectives	No. of weeks
		- Use sample spaces in simple cases. - Add and multiply probabilities in appropriate cases - Use both Vann diagrams and tree diagrams to calculate probabilities. - Show that events are independent or mutually exclusive. - Use conditional probability in simple cases. - Use the conditional probability formula $P(A/B) = \frac{P(A \cap B)}{P(B)}$	
Revision			1 (Suggested)

*PM1: Pure Mathematics 1

*P&S1: Probability & Statistics 1

المصدر التعليمي المعتمد ورقم الISBN لمادة الرياضيات الأساسية – الصف (11)

The Approved Resource and its ISBN for Basic Math– Grade (11)

	Title	Publisher	ISBN	Book Cover
1	PEARSON EDEXCEL INTERNATIONAL A LEVEL PURE MATHE MATICS 1 Student Book	Pearson	9781292244792	

Learning Outcomes for Basic Math– Grade (11)

Basic Math Grade 11 - Semester 1

Area	Reference Chapter	Objectives	No. of weeks
Algebra	Chapter (1) Algebraic Expressions	After completing this chapter, students should be able to: - Multiply and divide integer powers (pages 2-4) - Expand a single term over brackets and collect like terms (pages 2-4). - Expand the product of two or three expressions (pages 4-6). - Factorise linear, quadratic and simple cubic expressions (pages 6-9). - Know and use the law of indices (pages 9-11). - Simplify and use the rules of surds (pages 12-13). - Rationalise denominators (pages 13-15).	3
	Chapter (2) Quadratics	After completing this chapter, students should be able to: - Solve quadratic equations using factorization, the quadratic formula and completing the square (pages 19-24). - Read and use $f(x)$ notation when working with functions (pages 25-27). - Sketch the graph and find the turning point of a quadratic function (pages 27-30). - Find and interpret the discriminant of a quadratic expression (pages 30-32).	4
	Chapter (3) Equations and Inequalities	After completing this chapter, students should be able to: - Solve linear simultaneous equations using elimination or substitution (pages 37-38). - Solve simultaneous equations: one linear and one quadratic (Pages 39-40). - Solve linear inequalities (pages 44-46). - Solve quadratic inequalities (pages 46-49).	3
	Chapter (5) Straight Line Graphs	After completing this chapter, students should be able to: - Calculate the gradient of a line joining a pair of points(pages86-87). - Understand the link between the equation of a line, and its gradient and intercept (pages 87-89).	2
Revision			1 (Suggested)

Basic Math Grade 11 - Semester 2

Area	Reference Chapter	Objectives	No. of weeks
Trigonometry	Chapter (6) Trigonometric Ratios	After completing this chapter students should be able to: - Use the cosine rule to find a missing side or angle (pages 105-110). - Use the sine rule to find a missing side or angle (pages 110-116) - Find the area of a triangle using an appropriate Formula (pages 116-118). - Solve problems involving triangles (pages 118-122).	4
	Chapter (7) Radians	After completing this chapter students should be able to: - Convert between degrees and radians, and know exact values of angles measured in radians (Exercise 7A) All. (Pages 134-135). - Find an arc length using radians (Exercise 7B) Q1only (pages135-139). - Find areas of sectors and segments using radians (Exercise 7C) Q1,2 and 3. (pages139-145).	1.5
Calculus	Chapter (8) Differentiation	After completing this chapter students should be able to: - Find the derivative, $f'(x)$ or $\frac{dy}{dx}$, of a simple function (pages157-163). - Use the derivative to solve problems involving gradients, tangents and normals. (pages 163-165). - Find the second derivative, $f''(x)$ or $\frac{d^2y}{dx^2}$ of a simple Function (pages 165-166).	4
	Chapter (9) Integration	After completing this chapter students should be able to: - Find y given $\frac{dy}{dx}$ for x^n . (pages171-173). - Integrate polynomials (pages 172-175). - Find $f(x)$, given $f''(x)$ and a point on the curve (pages176-178).	2.5
Revision			1 (Suggested)

الفصل الثالث: الصف الثاني عشر

Section (2): Grade 12

الفهرس

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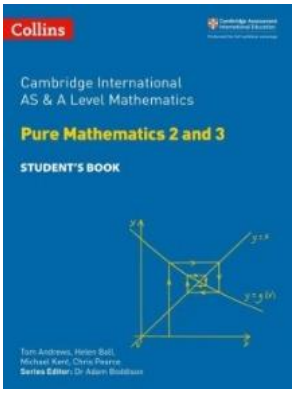
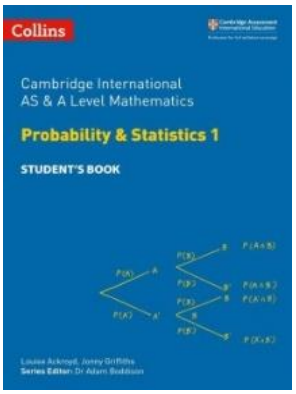
The Approved Resources and their ISBNs for Advance Math– Grade (12)

	Title	Publisher	ISBN	Book Cover
1	Cambridge International AS & A Level Mathematics Pure Mathematics 2&3 Student's Book	Collins	978-0-00-825774-3	
2	Cambridge International AS & A Level Mathematics Probability & Statistics 1 Student's Book	Collins	978-0-00-825776-7	
4	Cambridge International AS & A Level Mathematics Pure Mathematics 1, 2 & 3 Teacher's Guide - eBook	Collins	978-0-00-799018-4	Available online
5	Cambridge International AS & A Level Mathematics Probability & Statistics 1 Teacher's Guide - eBook	Collins	978-0-00-799019-1	Available online

Learning Outcomes for Advance Math – Grade (12)

Advance Math Grade 12 - Semester 1

Area	Reference Chapter	Objectives	Pages	No. of weeks
Algebra	Chapter (2) Logarithms and exponential functions (Pure Mathematics 2&3) Pages (36 to 54)	Understand the relationship between logarithms and indices and use the laws of logarithms.	(36 to 43)	3
		Understand the definition and properties of e^x and $\ln x$, including their relationship as inverse functions, and their graphs.	(44 to 51)	
		Use logarithms to solve equations of the form $a^x = b$, and similar inequalities. (Note: Applications of logarithms not included).	(52 to 54)	
Trigonometry	Chapter (3) Trigonometry (Pure Mathematics 2&3) Pages (65 to 80)	Use the expansions of $\sin(A \pm B), \cos(A \pm B)$ and $\tan(A \pm B)$.	(65 to 70)	4
		Use the formulae for $\sin 2A, \cos 2A$ and $\tan 2A$.	(70 to 72)	
		Use the expression of $a \sin\theta + b \cos\theta$ in the forms $R \sin(\theta \pm \alpha)$ and $R \cos(\theta \pm \alpha)$.	(73 to 75)	
		- Understand the relationship of the secant, cosecant and cotangent functions to cosine, sine and tangent. - Use the properties and graphs of all six trigonometric functions for angles of any magnitude.	(76 to 79)	
		Use trigonometric identities for the simplification and exact evaluation of expressions, in particular, $sec^2\theta \equiv 1 + tan^2\theta$ and $cosec^2\theta \equiv 1 + cot^2\theta$.	(79 to 80)	
Calculus	Chapter (4) Differentiation	Differentiate e^x, $\ln x$, $\sin x$ and $\cos x$.	(84 to 94)	3

Area	Reference Chapter	Objectives	Pages	No. of weeks
	(Pure Mathematics 2&3) Pages (84 to 104) and (111 to 115)	Differentiate products and quotients. NOTE: (tan x) dervitve included here.	(94 to 101)	
		Differentiate of $tan^{-1} x$.	(102 to 104)	
		Differentiate functions defined **implicitly only.**	(111 to 115)	
Probability and Statistics	Chapter (3) Discrete random variables (Probability & Statistics 1) Pages (83 to 96)	Construct a probability distribution table for a discrete random variable X.	(83 to 90)	2
		Calculate the expectation, E(X), and variance, Var(X), of a discrete random variable.	(90 to 94)	
			(94 to 96)	
Revision			1 (Suggested)	

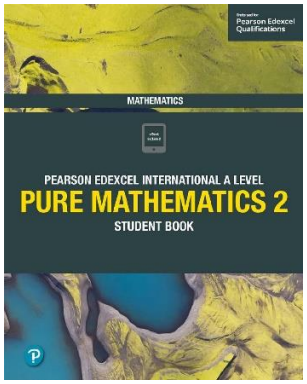
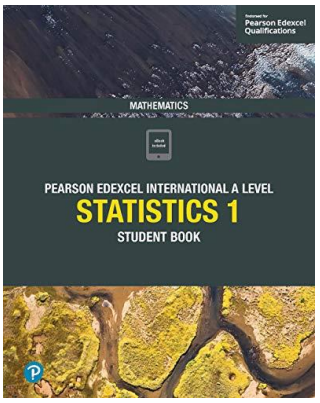
Advance Math Grade 12 - Semester 2

Area	Reference Chapter	Objectives	Pages	No. of weeks
Calculus	Chapter (5) Integration (Pure Mathematics 2&3) Pages (121 to 148)	Use the trapezium rule to estimate a definite integral.	(121 to 127)	4
		-Recognize integrals in particular forms. -Use trigonometrical relationships in carrying out integration.	(127 to 138)	
		Integrate using partial fractions.	(139 to 141)	
		Integrate using a substitution.	(142 to 145)	
		Use integration by parts.	(145 to 148)	
Vectors	Chapter (7) Vectors (Pure Mathematics 2&3) Pages (175 to 197)	-Use standard notation for vectors, i.e. $\begin{pmatrix} x \\ y \end{pmatrix}$, $x\boldsymbol{i} + y\boldsymbol{j}$, $\begin{pmatrix} x \\ y \\ z \end{pmatrix}$, $x\boldsymbol{i} + y\boldsymbol{j} + z\mathbf{k}$, $\overrightarrow{AB}$, $\mathbf{a}$ -Carry out addition and subtraction of vectors and multiplication of a vector by a scalar, and interpret these operations in geometrical terms. -Find the mid-point of a line as a vector.	(175 to 188)	2
		Calculate the magnitude of a vector, and use unit vectors, displacement vectors and position vectors.	(189 to 197)	
Algebra	Chapter (9) Complex numbers (Pure Mathematics 2&3) Pages (242 to 264)	-Understand the idea of a complex number, recall the meaning of the terms real part, imaginary part, modulus, argument, conjugate, and use the fact that two complex numbers are equal if and only if both real and imaginary parts are equal. - Represent complex numbers geometrically by means of an Argand diagram.	(242 to 249)	3
		Carry out operations of addition, subtraction, multiplication and division of two complex numbers expressed in Cartesian form $x + \boldsymbol{i}y$.	(250 to 253)	
		Find the two square roots of a complex number.	(254 to 256)	
		Use the result that, for a polynomial equation with real coefficients, any non-real roots occur in conjugate pairs.	(256 to 259)	
		Carry out the operations of multiplication and division of two complex numbers expressed in polar form: $r(\cos\theta + i\sin\theta) \equiv re^{i\theta}$.	(259 to 264)	

Probability and Statistics	Chapter (4) Normal Distribution (Probability & Statistics 1) Pages (117 to 143)	-Understand and use the normal distribution to model continuous random variables. -Analyze the shape and symmetry of the normal distribution.	(117 to 125)	3
		Find probabilities using the normal distribution table, given the values of μ and σ.	(126 to 139)	
		Find μ and σ given probabilities.	(139 to 143)	
Revision			1 (Suggested)	

المصدر التعليمي المعتمد ورقم الISBN لمادة الرياضيات الاساسية – الصف (12)

The Approved Resource and its ISBN for Basic Math– Grade (12)

	Title	Publisher	ISBN	Book Cover
1	PEARSON EDEXCEL INTERNATIONAL A LEVEL PURE MATHEMATICS 2 Student Book	Pearson	9781292244853	
2	PEARSON EDEXCEL INTERNATIONAL A LEVEL STATISTICS 1 Student Book	Pearson	9781292245140	

Learning Outcomes for Basic Math– Grade (12)

Basic Math Grade 12 - Semester 1

Area	Reference Chapter	Objectives Students should be able to:	Pages	No. of weeks
Algebra	Chapter (1) Algebraic methods (PURE MATHEMATICS 2) Pages (2 to 13)	• Cancel factors in algebraic fractions	(2 to 3)	3.5
		• Divide a polynomial by a linear expression	(3 to 6)	
		• Use the factor theorem to factorize a cubic expression	(7 to 11)	
		• Use the remainder theorem to find the remainder when a polynomial f(x) is divided by (ax - b)	(11 to 13)	
	Chapter (3) Exponentials and logarithms (PURE MATHEMATICS 2) Pages (52 to 59) **(Sketching not to be included)**	• Recognize the relationship between exponents and logarithms.	(52 to 54)	3
		• Recall and apply the laws of logarithms.	(54 to 56)	
		• Solve equations of the form $a^x=b$.	(57 to 58)	
		• Change the base of a logarithm.	(58 to 59)	
Calculus	Chapter (7) Differentiation (PURE MATHEMATICS 2) Pages (138 to 143)	• Identify increasing and decreasing functions	(138)	2
		• Find stationary points of functions and determine their nature	(139 to 143)	
Statistics	Chapter (2) Measures of location and spread. (Statistics 1) Pages (6 to 21)	• Recognize different types of data.	(6 to 8)	3.5
		• Calculate measures of central tendency such as the mean, median and mode.	(9 to 12)	
		• Calculate measures of location such as percentiles.	(13 to 15)	

Area	Reference Chapter	Objectives Students should be able to:	Pages	No. of weeks
		• Calculate measures of spread such as range, interquartile range and interquartile range.	(16 to 17)	
		• Calculate variance and standard deviation.	(18 to 21)	
Revision			1 (Suggested)	

Basic Math Grade 12 - Semester 2

Area	Reference Chapter	Objectives Students should be able to:	Pages	No. of weeks
Algebra	Chapter (4) The binomial Expansion (PURE MATHEMATICS 2) Pages (63 to 68)	• Use Pascal's triangle to identify binomial coefficients and use them to expand simple binomial expressions.	(63 to 64)	3
		• Use combinations and factorial notation.	(65 to 66)	
		• Use the binomial expansion to expand brackets.	(67 to 68)	
	Chapter (5) Sequences and series (PURE MATHEMATICS 2) Pages (81 to 96)	• Find the n^{th} term of an arithmetic sequence	(81 to 83)	3.5
		• Prove and use the formula for the sum of the first n terms of an arithmetic series.	(84 to 86)	
		• Find the n^{th} term of a geometric sequence.	(87 to 90)	
		• Prove and use the formula for the sum of a finite geometric series.	(91 to 93)	
		• Prove and use the formula for the sum to infinity of a convergent geometric series.	(94 to 96)	
Calculus	Chapter (8) Integration (PURE MATHEMATICS 2) Pages (153 to 159) **(Diagram should be given for any required area)** **(Equation should be given in factorized form)**	• Evaluate a definite integral.	(153 to 154)	2.5
		• Find the area bounded by a curve and the x-axis.	(155 to 159)	
Statistics	Chapter (3) Representations of data (Statistics 1) Pages (35 to 47)	• Identify outliers in data sets.	(35 to 37)	3
		• Draw and interpret box plots.	(38 to 40)	
		• Draw and interpret stem and leaf diagrams.	(40 to 44)	
		• Work out whether or not data is skewed.	(44 to 47)	
Revision			1 (Suggested)	

نهاية الوثيقة

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