

MARINA INTERNATIONAL SCHOOL

ADDITIONAL MATHS SCHEME OF WORK

FORM 5 - TERM 1

WEEK	TOPIC	TOPIC DETAILS
1.1	Binomial	use the Binomial Theorem for expansion of $(a + b)^n$ for positive integer n use the general term
1.2	Binomial	Recognise arithmetic and geometric progressions
1.3	Binomial	Use the formulae for the n th term and for the sum of the first n terms to solve problems involving arithmetic or geometric progressions
1.4	Binomial	Use the condition for the convergence of a geometric progression, and the formula for the sum to infinity of a convergent geometric progression
2.1	Quadratic Functions	Find the maximum or minimum value of the quadratic function $f : x \mapsto ax^2 + bx + c$ by any method
2.2	Quadratic Functions	Use the maximum or minimum value of $f(x)$ to sketch the graph or determine the range for a given domain
2.3	Quadratic Functions	Know the conditions for $f(x) = 0$ to have: (i) two real roots, (ii) two equal roots, (iii) no real roots and the related conditions for a given line to (i) intersect a given curve, (ii) be a tangent to a given curve, (iii) not intersect a given curve
2.4	Quadratic Functions	Solve quadratic equations for real roots and find the solution set for quadratic inequalities
3.1	Trigonometry	Know the six trigonometric functions of angles of any magnitude (sine, cosine, tangent, secant, cosecant, cotangent)
3.2	Trigonometry	Understand amplitude and periodicity and the relationship between graphs of related trigonometric functions, e.g. $\sin x$ and $\sin 2x$

WEEK	TOPIC	TOPIC DETAILS
3.3	Trigonometry	Draw and use the graphs of $y = a \sin bx + c$ $y = a \cos bx + c$ $y = a \tan bx + c$ where a is a positive integer, b is a simple fraction or integer (fractions will have a denominator of 2, 3, 4, 6 or 8 only), and c is an integer
4.1	Trigonometry	Use the relationships $\sin^2 A + \cos^2 A = 1$ $\sec^2 A = 1 + \tan^2 A$, $\operatorname{cosec}^2 A = 1 + \cot^2 A$ $\frac{\sin A}{\cos A} = \tan A$ $\frac{\cos A}{\sin A} = \cot A$
4.2	Trigonometry	Solve simple trigonometric equations involving the six trigonometric functions and the above relationships (not including general solution of trigonometric equations)
4.3	Trigonometry	Prove simple trigonometric identities
5.1	Differentiation	Understand the idea of a derived function Use the notations $f'(x)$, $f''(x)$, dy/dx , etc
5.2	Differentiation	use the derivatives of the standard functions x^n (for any rational n), $\sin x$, $\cos x$, $\tan x$, e^x , $\ln x$, together with constant multiples, sums and composite functions of these
6.1	Differentiation	Differentiate products and quotients of functions
6.2	Differentiation	Apply differentiation to gradients, tangents and normals, stationary points, connected rates of change, small increments and approximations and practical maxima and minima problems
7.1	Differentiation	Use the first and second derivative tests to discriminate between maxima and minima
7.2	Differentiation	Understand integration as the reverse process of differentiation integer (fractions will have a denominator of 2, 3, 4, 6 or 8 only), and c is an integer
8.1	Integration	Integrate sums of terms in powers of x
8.2	Integration	Integrate functions of the form $(ax + b)^n$ for any rational n , $\sin(ax + b)$, $\cos(ax + b)$, $e^{ax + b}$
9.1	Integration	Evaluate definite integrals and apply integration to the evaluation of plane areas

WEEK	TOPIC	TOPIC DETAILS
9.2	Integration	Apply differentiation and integration to kinematics problems that involve displacement, velocity and acceleration of a particle moving in a straight line with variable or constant acceleration, and the use of x-t and v-t graphs
10.1	Revision	Solving past paper questions
11.1	Revision	Solving past paper questions
12.1	Revision	Solving past paper questions
13.1	Revision	Solving past paper questions
14.1	REVISION	Solving past paper questions

ADDITIONAL MATHS SCHEME OF WORK

FORM 5 - TERM 2

WEEK	TOPIC	TOPIC DETAILS
1.1	PERMUTATION AND COMBINATION	Recognise and distinguish between a permutation case and a combination case
1.2	PERMUTATION AND COMBINATION	Know and use the notation $n!$ (with $0! = 1$), and the expressions for permutations and combinations of n items taken r at a time.
2.1	PERMUTATION AND COMBINATION	Answer simple problems on arrangement and selection (cases with repetition of objects, or with objects arranged in a circle, or involving both permutations and combinations, are excluded)
3.1	DIFFERENTIATION	Understand the idea of a derived function
3.2	DIFFERENTIATION	Use the notations $f'(x), f''(x)$, for dy/dx and d^2y/dx^2
4.1	DIFFERENTIATION	Use the derivatives of the standard functions x^n (for any rational n), $\sin x$, $\cos x$, $\tan x$, e^x , $\ln x$, together with constant multiples, sums and composite functions of these
4.2	DIFFERENTIATION	Apply differentiation to gradients, tangents and normals, stationary points, connected rates of change, small increments and approximations and practical maxima and minima problems
5.1	DIFFERENTIATION	Use the first and second derivative tests to discriminate between maxima and minima
6.1	Vectors in two dimensions	Use vectors in any form
6.2	Vectors in two dimensions	Know and use position vectors and unit vectors

WEEK	TOPIC	TOPIC DETAILS
7.1	Vectors in two dimensions	Find the magnitude of a vector; add and subtract vectors and multiply vectors by scalars
7.2	Vectors in two dimensions	Compose and resolve velocities
8.1	Logarithms	Transform given relationships, including $y = ax^n$ and $y = Abx$, to straight line form and hence determine unknown constants by calculating the gradient or intercept of the transformed graph
9.1	GENERAL REVISION	SYLLABUS CONTENTS AND PAST PAPERS

ADDITIONAL MATHS SCHEME OF WORK

FORM 5 - TERM 3

WEEK	TOPIC	TOPIC DETAILS
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