ACHIEVERS ARC

2027 SEC 4 A MATH LESSON PLAN

SEMESTER 1 (NOV - JAN)

LESSON	LESSON NAME	LEARNING OBJECTIVES
1	Differentiation	1) Be able to understand various differentiation rules and find derivatives of basic functions. 2) Understand and be able to apply the chain rule for derivatives. 3) Understand and be able to apply the product and quotient rule for derivatives.
2		
3		
4	Tangents, Normals and Rates of Change	1) Be able to find tangents and normals at points of a given curve using derivatives. 2) Understand and be able to find the rates of change at any point of a given curve. 3) Be able to solve various applied problems involving rates of change.
5		
6		
7	Maxima and Minima	1) Be able to find higher order derivatives of a given function. 2) Be able to identify increasing and decreasing functions. 3) Be able to find and determine the nature of stationary points of various curves. 4) Be able to solve various maxima and minima problems using derivatives.
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2027 SEC 4 A MATH LESSON PLAN

SEMESTER 2 (JAN - APR)

LESSON	LESSON NAME	LEARNING OBJECTIVES
1	Revision Chapters 1 to 3	
2		
3	Further Differentiation	1) Be able to find the derivatives of trigonometric, exponential and logarithmic functions. 2) Understand and be able to apply derivatives onto various real world problems.
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5		
6		
7	Indefinite Integrals	1) Be able to understand and apply the basic rules of integration. 2) Be able to integrate trigonometric and exponential functions. 3) Solve simple applied problems involving indefinite integrals.
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11	Mid Year Examination Mock Test	

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2027 SEC 4 A MATH LESSON PLAN

SEMESTER 3 (APR – AUG)

LESSON	LESSON NAME	LEARNING OBJECTIVES
1	Definite Integrals	1) Be able to evaluate definite integrals. 2) Be able to find areas bounded by lines and curves using definite integrals.
2		
3		
4	Kinematics	1) Be able to apply differentiation and integration on simple kinematics problems. 2) Understand the relationships between acceleration, velocity and displacement. 3) Be able to model various real world problems as kinematics problems.
5		
6		
7	Proofs in Plane Geometry	1) Understand the proofs involving properties of parallel lines, congruent triangles and quadrilaterals. 2) Understand the proofs involving similar triangles and the midpoint theorem. 3) Understand the proofs involving circles and the tangent chord theorem.
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10	Revision Chapters 6 to 8	
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12		

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2027 SEC 4 A MATH LESSON PLAN

SEMESTER 4 (AUG – OCT)

LESSON	LESSON NAME	LEARNING OBJECTIVES
1	Revision: Quadratic Functions and Inequalities	
2	Revision: Surds	
3	Revision: Polynomials and Partial Fractions	
4	Revision: Exponential and Logarithmic Functions and Equations	
5	Revision: Binomial Expansions	
6	Revision: Coordinate Geometry of Lines and Rectilinear Figures	
7	Revision: Coordinate Geometry of Circles	
8	Revision: Trigonometric Functions, Graphs and Equations	
9	Revision: Trigonometric Identities and Formulae	
10	End of Year Examination Mock Test 1	
11	End of Year Examination Mock Test 2	

2027 中四年级 (进阶数学) 课程表

第 1 学期（11 月 至 1 月）

课	标题	教学目标
1	微分	**1)** 能够理解各种微分规则并对基本函数求导。 **2)** 理解并能够应用链式法则求导。 **3)** 理解并能够应用乘积法则与商法则求导。
2		
3		
4	切线、法线 与 变化率	**1)** 能够利用导数求曲线上某点的切线与法线方程。 **2)** 理解并能够求曲线上任意一点的变化率。 **3)** 能够解决各种与变化率相关的实际应用问题。
5		
6		
7	极大值与极小值	**1)** 能够求函数的高阶导数。 **2)** 能够判断函数的增区间与减区间。 **3)** 能够求出曲线的驻点，并判断其性质（极大、极小或拐点）。 **4)** 能够利用导数解决各种极值问题。
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2027 中四年级 (进阶数学) 课程表

第 2 学期（1 月 至 4 月）

课	标题	教学目标
1	专题练习 1 - 3	
2		
3	进阶微分	1) 能够求三角函数、指数函数和对数函数的导数。 2) 理解并能够将微分应用于各种实际问题。
4		
5		
6		
7	不定积分	1) 能够理解并应用基本积分规则。 2) 能够对三角函数和指数函数进行积分。 3) 能够解决涉及不定积分的简单应用问题。
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11	年中考试模拟试卷	

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2027 中四年级 (进阶数学) 课程表

第 3 学期（4 月 至 8 月）

课	标题	教学目标
1	定积分	1) 能够计算定积分的数值。 2) 能够利用定积分求由直线与曲线围成的面积。
2		
3		
4	运动学	1) 能够将微分与积分应用于基础运动学问题。 2) 理解加速度、速度与位移之间的关系。 3) 能够将各种实际情境建模成运动学问题并求解。
5		
6		
7	平面几何中的证明	1) 理解与平行线性质、全等三角形和四边形性质相关的几何证明。 2) 理解与相似三角形与中点定理相关的几何证明。 3) 理解与圆、切线-弦定理相关的几何证明。
8		
9		
10	专题练习 6 - 8	
11		
12		

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2027 中四年级（进阶数学）课程表

第 4 学期（8 月 至 10 月）

课	标题	教学目标
1	复习：二次函数与不等式	
2	复习：根式	
3	复习：多项式与部分分式	
4	复习：指数与对数函数及方程	
5	复习：二项式展开	
6	复习：直线与矩形图形的坐标几何	
7	复习：圆的坐标几何	
8	复习：三角函数、图像与方程	
9	复习：三角恒等式与公式	
10	年终考试模拟试卷 1	
11	年终考试模拟试卷 2	