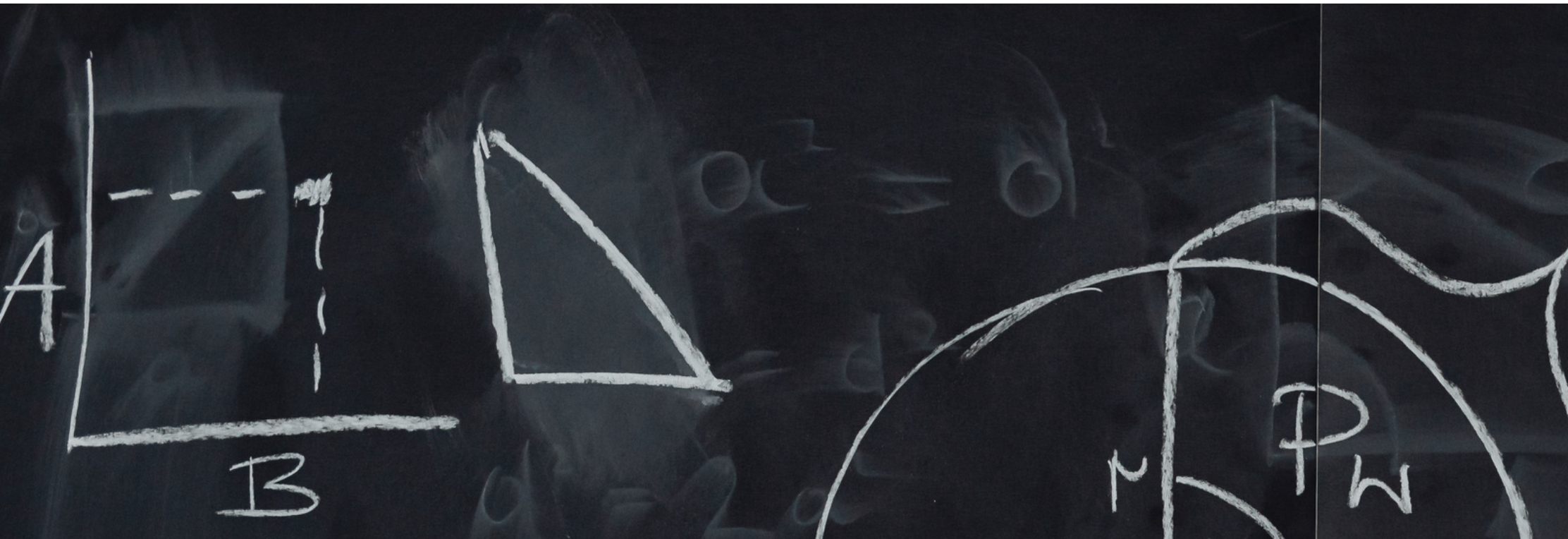




$\sin 300^\circ =$
 $= \sin(3 \cdot 90^\circ + 30^\circ)$
 $= \cos 30^\circ = -\frac{\sqrt{3}}{2}$

$\tan x \pm \tan y = \frac{\sin(x \pm y)}{\cos x \cos y}$
 $a^2 + b^2 = c^2$

$P_N = \frac{\alpha}{360^\circ} \cdot \pi \cdot r^2$
 $\frac{P_N}{\pi \cdot r^2} = \frac{\alpha}{360^\circ}$
 $\frac{L}{2 \cdot \pi \cdot r} = \frac{\alpha}{360^\circ}$

PEFA Academy Mathematics Curriculum Plan

PROGRAMME OVERVIEW

The A Level Mathematics programme is designed to develop students' analytical, logical, and problem-solving abilities through the study of pure mathematics, mechanics, and statistics. The course equips learners with the mathematical knowledge and skills required for higher education and professional careers in fields such as engineering, economics, computer science, data science, finance, and the physical sciences. The programme emphasizes conceptual understanding, mathematical reasoning, modelling, and the practical application of mathematical techniques to real-world situations.

Learning Approach

PEFA Academy adopts a flexible and student-centred learning approach designed to help students develop a thorough understanding of mathematical concepts while preparing effectively for advanced-level examinations. The programme incorporates:



Live Online Classes



Recorded Lessons



Interactive Discussions



Guided Problem-Solving Sessions



Practical Mathematical Exercises



Examination-Style Questions



Weekly Assignments



Topic-Based Assessments



Mock Examinations



Past Question Practice



Tutor Support Sessions

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Course Structure

The curriculum is divided into six major learning areas:

Module 1: Pure Mathematics I

This module introduces fundamental algebraic and mathematical concepts that form the foundation for advanced mathematical studies.

Topics Covered

- Quadratics
- Functions
- Coordinate Geometry
- Circular Measure
- Trigonometry
- Sequences and Series
- Differentiation
- Integration

Learning Outcomes

By the end of this module, students should be able to:

- Solve quadratic equations and inequalities
- Apply function notation and transformations
- Solve coordinate geometry problems
- Use trigonometric identities and equations
- Apply differentiation and integration techniques
- Solve problems involving sequences and series

Module 2: Pure Mathematics II

This module extends students' understanding of algebra, trigonometry, calculus, and numerical methods.

Topics Covered

- Advanced Algebra
- Logarithmic Functions
- Exponential Functions
- Advanced Trigonometry
- Differentiation Techniques
- Integration Techniques
- Numerical Solution of Equations

Learning Outcomes

Students should be able to:

- Solve logarithmic and exponential equations
- Apply advanced trigonometric identities
- Differentiate and integrate complex functions
- Use numerical methods to solve equations
- Interpret mathematical models



Modules 3 & 4

Module 3: Pure Mathematics III

This module develops advanced mathematical techniques used in higher-level mathematics and scientific applications.

Topics Covered

- Partial Fractions
- Binomial Expansion
- Advanced Calculus
- Parametric Equations
- Differential Equations
- Vectors
- Complex Numbers
- Numerical Methods

Learning Outcomes

Students should be able to:

- Apply advanced algebraic techniques
- Solve differential equations
- Perform vector calculations in two and three dimensions
- Work with complex numbers and Argand diagrams
- Solve advanced calculus problems

Module 4: Mechanics

This module introduces the mathematical principles used to describe motion, forces, and physical systems.

Topics Covered

- Forces and Equilibrium
- Kinematics
- Momentum
- Newton's Laws of Motion
- Work, Energy and Power

Learning Outcomes

Students should be able to:

- Analyse forces acting on bodies
- Solve problems involving motion
- Apply Newton's laws to practical situations
- Calculate momentum and energy
- Interpret real-life mechanical systems



Modules 5 & 6: Probability and Statistics

Module 5: Probability and Statistics I

This module introduces statistical analysis and probability concepts used in data interpretation and decision-making.

Topics Covered

- Data Representation
- Measures of Central Tendency
- Measures of Dispersion
- Permutations and Combinations
- Probability
- Discrete Random Variables
- Binomial Distribution
- Geometric Distribution
- Normal Distribution

Learning Outcomes

Students should be able to:

- Organise and analyse data
- Calculate probabilities
- Apply probability distributions
- Interpret statistical information
- Solve practical statistical problems

Module 6: Probability and Statistics II

This module builds on statistical concepts and develops more advanced methods of statistical analysis and inference.

Topics Covered

- Poisson Distribution
- Continuous Probability Distributions
- Sampling Techniques
- Estimation
- Hypothesis Testing
- Correlation and Regression
- Statistical Modelling

Learning Outcomes

Students should be able to:

- Apply advanced statistical techniques
- Interpret statistical models
- Conduct hypothesis testing
- Analyse relationships between variables
- Draw conclusions from statistical data



Assessment Framework

Continuous Assessment

Students will be assessed through:

- Weekly Assignments
- Topic-Based Tests
- Class Activities
- Problem-Solving Exercises

Module Assessments

At the end of each module, students will complete:

- Written Assessments
- Practical Mathematical Exercises
- Timed Examination Questions

Mock Examinations

Students will participate in:

- Mid-Programme Mock Examinations
- Final Mock Examinations
- Examination Technique Workshops

Programme Outcome

Upon successful completion of the programme, students will possess the mathematical knowledge, analytical thinking skills, and problem-solving abilities required for advanced studies and professional careers. They will be able to apply mathematical concepts confidently, interpret quantitative information effectively, and solve complex problems across a wide range of academic and real-world contexts.

Final Examination Preparation

Preparation activities include:

- Past Question Practice
- Revision Classes
- Tutor Feedback Sessions
- Performance Reviews
- Examination Readiness Assessments