

# Maths 3b syllabus outline

## 1. Arithmetics and linear programming

- Geometric series and geometric series sum
- Continuous saving and exponentials
- Loans
- Dividing the plane with equations
- Value in each point of the plane
- Finding the highest and lowest value

## 2. Functions and limits

### Polynomial functions

- Polynomial functions of one term (monomials)
- Polynomial functions with two terms
- Some calculations with polynomials
- Polynomial functions of higher degree
- Factorisation of polynomial functions
- Solving polynomial equations of second degree

### Algebra

- Simplifying rational expressions with polynomials
- Solving rational equations with polynomials

### Limits

- Discrete and continuous functions
- Domain
- Concept of limit
- Uses of limits

## 3. Differentiation

- Rate of change and slope.
- Concept of derivative of a function in a point
- Graphical interpretation of the derivative
- Relationships between the derivative and the tangent line
- Special cases of derivative
- Differentiation of basic functions

## 4. Uses of the derivative

### Extreme points

- Functions that increase or decrease
- Local maximum and minimum
- Absolute maximum and minimum
- Applications
- Second derivative and its meaning
- Identifying maximum and minimum using the second derivative

### Derivatives in the function's graph

- Graph of a function and graph of its derivative

### Derivatives of exponential functions

- The number  $e$  and its special relationship with the derivative
- Logarithms and their relationship with the number  $e$

## 5. Integration

- The primitive function
- Primitive and derivative
- Integration and its meaning
- Primitive practice
- Applications of integration