

## Algebra and Calculus (CASP)

Both algebra and calculus are essential tools in the study of mathematics and physics. In this course we will cover the following topics:

*Polynomials, exponentials and logarithms:* sketching and transforming their curves and using them to solve problems.

*Vectors:* their use in two and three dimensions, their various products and their usage in physics.

*Matrices:* manipulating them and using them to describe transformations and solve linear equations.

*Differentiation:* its meaning and role in explaining rates of change of functions, and its definition and calculation.

*Integration:* its role as the inverse operation to differentiation and its interpretation in calculating areas and volumes.

*Differential equations:* introduction to several types and the way these are solved, including the role of boundary conditions.

Knowledge of basic algebra (linear and quadratic equations) and some geometry and basic trigonometry is all you will need to follow this course.