Y11 IGCSE Further Maths (Edexcel) / Additional Maths (0606, CIE) crash-course

These two math courses are truly challenging courses that will stretch students to their limit in terms of utilising their entire arsenal of mathematical skills. Akademia's experienced and insightful tutors will showcase their systematic and organised problem-solving prowess to aspiring students aiming for an A* (minimum requirement in the low 90s and high 80s for CIE and Edexcel, respectively). Our crash course will equip typically above-average students with skills that will serve them well, not only for their further maths / additional maths exams, but also for their IB or A–level studies.

Course duration: 8 to 13 hours, depends on students' or parents' choice of topics, and tutor availability

Tutors: Ms. Cecilia Foo or Mr. Jenkins Tsang

Topic list and suggested time allocation

Topic 1 (1 to 2 hours): Algebra and equation solving, with focus on:

- Disguised polynomial and disguised simultaneous equations
- Inequalities and absolute functions involving critical value behaviour analysis

Topic 2 (2 to 3 hours): Functions and graphs: Graph-plotting of basic analytical functions with special emphases on:

- Recognising key features (e.g. asymptotes, symmetry) of different types of graphs
- When to use and not use the graphic-display calculator (Edexcel)
- Deriving straight–line relationships (CIE)
- Polynomial properties
- Graphical methods for analytically–unsolvable problems (Edexcel)

Topic 3a (0.5 to 1 hour): Coordinate geometry

- Distances, gradients, straight line properties, 2–D inequalities, and problem solving

Topic 3b (0.5 to 1 hr): Sequences, miscellaneous algebra, permutation, combination and binomial theorems

- Sequence and series word problems (Edexcel)
- Matrix algebra (CIE)
- Techniques on exhaustive listing and systematic counting (CIE)

Topic 4: (2 to 3 hours) Trigonometry, 3D geometry and vectors

- Proof of trigonometric identities
- Using the unit circle to solve problems
- Drawing relevant diagrams and visualising 3D shapes
- Application in vector addition and travelling
- Application of trigonometry in geometry

Topic 5: (2 to 3 hours) Calculus

- How to properly use product rule, quotient rules, and chain rules
- Unfamiliar graph sketching, including stationary points and points of inflection determination
- Setting up problems of optimisation problems and related rates of change
- Integration as antiderivatives
- Definite integrals, relation to area and volumes of revolution
- Motion (displacement, velocity, acceleration) analysis

Provided materials:

- Customised, illustrative, house–made topic–sorted questions, with varying levels of difficulties
- Past paper practices