RUGBY SCHOOL

16+ ENTRANCE EXAMINATIONS
for entry in September 2027

All written examination papers are one hour in duration

Dictionaries are not permitted in any written papers – except for those candidates whose first language is not English; who apply in advance and qualify for the use of a dictionary under current JCQ rules. These candidates may apply to use a non-electronic, bilingual dictionary.

Compulsory subjects

English

Structure of paper:

- A comprehension passage
- A writing task related to the comprehension passage: there will be a choice of topics.

No prior knowledge is required.

Skills being tested:
The ability to understand texts in terms of interpretation and analysis of linguistic and expressive techniques; the ability to write clear, concise, well-structured and expressive English.

Mathematics

Recognising that some students will know that their future educational path does not explicitly include maths, the exam will provide for everyone.
The exam will consist of 3 Sections, A, B and C.
Candidates choose one of two routes through the paper, based on their future aspirations.

- **Group 1: Sections A and B should be completed by candidates not intending to study Maths in the Sixth Form, or who intend to study IB Standard Level Maths.** This will cover questions roughly equivalent to GCSE grades 5-8.

- **Group 2: Sections B and C should be completed by candidates intending to study Maths or Further Maths at A level, or IB maths at Higher Level.** This will cover questions roughly equivalent to GCSE grades 6-9 and beyond.

  A Group 1 candidate can choose to sit the Group 2 sections instead if they consider themselves a strong mathematician (anticipating a grade 9 at GCSE).

The topic list that follows gives details of the requirements for each section of the paper. Note that a topic may appear more than once across the three sections, but is likely to require deeper mathematical insight in Section C than in Section A.

Mathematics Topic List

Section A (Non-maths A Level and IB SL)
The content of the Edexcel IGCSE Foundation exam is assumed throughout.

Algebra:
Manipulating expressions – expanding brackets, factorising into single and double brackets, simplifying algebraic sums and products
Solving equations – linear equations (including involving fractions), quadratic equations
Indices – rules thereof
Substituting into expressions
Plotting linear and non-linear graphs from tables

Number:
Surds
Indices
Order of operations
Disproof by counterexample (formal proof not expected)
Fractional arithmetic
Percentages, fractions, and decimals
Ratio
HCF and LCM
Rounding to DP and SF

Geometry:
Pythagoras
Trigonometry in right angled triangles
Area and perimeter of 2D shapes
Volume and surface area of 3D shapes

Section B (All candidates)

As above, but additionally:

Algebra:
Expanding more than two brackets, simultaneous equations, completing the square

Number:
Rounding and range of values.
Arithmetic Sequences and Series

Geometry:

Similar shapes (in 2D and 3D)

Trigonometry all triangles

Probability of up to three events (including conditional)

Section C (Maths and Further Maths A Level and IB HL)
As above, but additionally:

Algebra:
Explaining and reasoning mathematically

Number:
Problems involving properties of numbers

Geometry:
Coordinate Geometry

The IGCSE Foundation Specification can be found at this address:
https://qualifications.pearson.com/content/dam/pdf/International%20GCSE/Mathematics%20A/2016/Specification%20and%20sample%20assessments/international-gcse-in-mathematics-spec-a.pdf

Mathematics Formulae Sheet *(to be included on page 2 of the exam paper)*

Arithmetic Sequences and Series

General term, $U_n = a + (n-1)d$

Sum to n terms, $S_n = \frac{n}{2}[2a + (n-1)d]$

The quadratic equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

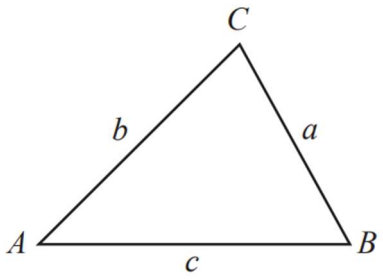
Trigonometry

In any triangle, ABC,

$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)}$$

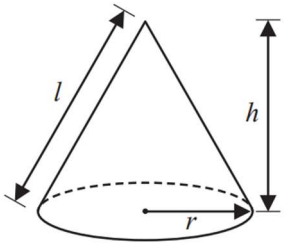
$$a^2 = b^2 + c^2 - 2bccos(A)$$

$$Area = \frac{1}{2}absin(C)$$

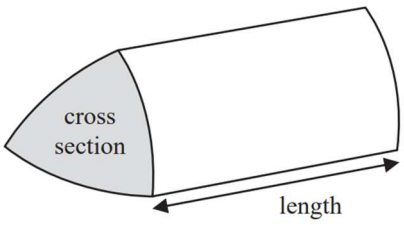


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = πrl

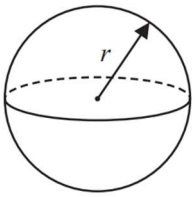


Volume of prism
= area of cross section × length

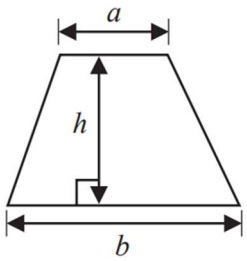


Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

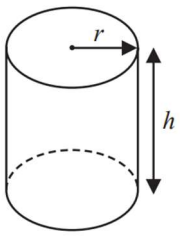


Area of trapezium = $\frac{1}{2}(a+b)h$



Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi rh$



Additional subjects

Art

- Candidates will be asked to draw directly from observation, working in charcoal from a still life arrangement in the Design Centre Art Studios. The drawing will be on an A1 scale and will take 1 hour.
- They will also be expected to bring a portfolio of their work with them to be discussed in an interview with the Head of the Art department.

Biology

Structure of paper:

- Multiple Choice: 20 marks
- Structured Questions: 30 marks

Required knowledge:

- Standard GCSE Biology syllabus knowledge.
- Covering a variety of areas including molecules, cells, animal physiology, plant physiology, ecology and inheritance

Skills being tested:

- Knowledge of biological concepts
- Ability to perform simple calculations using information provided (e.g. percentage change, ratios, rates)
- Analyse data and graphs
- Draw graphs
- Ability to construct a practical set-up
- Ability to critique experimental methodology

Chemistry

Structure of paper:

- Multiple Choice: 30 marks
- Structured Questions: 30 marks

Required knowledge:

The Chemistry 16+ paper will cover the following subtopics

- States of matter
- Elements, compounds and mixtures
- Atomic structure and the periodic table
- Chemical formulae, equations and calculations
  Note: Calculations involving concentrations are not required
- Bonding – ionic, covalent and metallic
- Reactivity series of metals
- Acids, bases, alkalis and salts – reactions and salt preparations
- Rates of reaction
- Basic organic chemistry – hydrocarbons and crude oil

Candidates will be provided with a copy of the periodic table.

Skills being tested

- Knowledge and understanding of chemistry
- Application of knowledge and understanding, analysis, and evaluation of chemistry
- Experimental skills, including the analysis and evaluation of data and methods in chemistry

Computer Science

Structure of paper:

- Section A – Hardware and Software: 25 marks
- Section B – Programming: 25 marks
- Section C – Implications of Computer Use: 5 marks

Required knowledge:

- Students are expected to have a strong understanding of the GCSE Computing syllabus although some areas of the assessment may test knowledge beyond this point.
- The written assessment content is taken from the GCSE course sections that relate to programming and coding constructs, data representation, hardware, software, networking, computer architectures and the use and effect of digital technology across society.
- Practical programming skills will also be assessed, and candidates should be able to interpret a real-world problem before analysing, designing and then implementing a solution using a high-level language.

Skills being tested:

- The ability to recall key facts.
- The ability to apply basic programming concepts to unfamiliar situations.
- The ability to construct clear and logical answers.

Design

Structure of paper:

- The paper will consist of just one question or design task.
- Part one will ask for a range of concepts to be produced in response to a given brief.
- Part two will ask for a developed solution of the selected concept or concepts.
- The format will be A3 plain paper.

Required knowledge:

- Knowledge of materials and their properties.
- Knowledge of the Design Process.
- Awareness of meeting wants and needs of the client or intended user.
- Awareness of appropriate manufacturing techniques/processes and fabrication methods.

Skills being tested:

- Ability to analyse a brief and identify key criteria needed to develop a viable solution.
- Drawing skills – isometric technique, 3rd Angle orthographic projection and freehand sketching in 3D.
- Creative ability – production of a range of innovative, feasible solutions.
- Evaluative decision making – ability to show through drawings supported by annotation, the justification for choices made.

Geography

Structure of paper:

- Section A: Compulsory data response question testing general Geographical skills.
- Section B: Candidates are required to answer one mini-essay question (1-2 sides), chosen from a variety of titles.

Required knowledge:

- No prior subject knowledge is needed for the skills question. A synoptic approach may be adopted bringing in knowledge from several different subjects and experiences.
- GCSE level (any specification) subject knowledge is needed for the mini essays.

Geography continued

Skills being tested:
- Ability to use and evaluate visual and numerical resource stimuli.
- Ability to infer conclusions from visual or numerical resource stimuli.
- Ability to write an essay based on the title given and coming to a clear conclusion.

Greek

Structure of paper:
- Comprehension and short translation based on a passage of unprepared Greek, using OCR GCSE vocabulary and grammar.
- English to Greek sentences using OCR GCSE 'restricted vocabulary' list.
- Literary Criticism questions on an unseen text, with translation provided, in the manner of OCR prose and verse set text assessment.

Required knowledge:
- OCR GCSE Vocabulary and Grammar.
- Basic literary appreciation techniques.

Skills being tested:
- Ability to understand an unseen Greek text.
- Ability to form Greek sentences from English originals.
- Literary criticism of an unseen text.

History

Structure of paper:
- 2 source-based questions:
    - 3 marks
    - 7 marks
- 1 essay: 20 marks

(total 30 marks available)

Required knowledge:
No specific knowledge required.

Skills being tested:
- source comprehension.
- the ability to recall, select and deploy historical knowledge.
- the ability to construct argument through explanation, analysis and substantiated judgement.

Latin

Structure of paper:
- Comprehension and short translation based on a passage of unprepared Latin, using OCR GCSE vocabulary and grammar.
- English to Latin sentences using OCR GCSE 'restricted vocabulary' list.
- Literary Criticism questions on an unseen text, with translation provided, in the manner of OCR prose and verse set text assessment.

Required knowledge:
- OCR GCSE Vocabulary and Grammar.
- Basic literary appreciation techniques.

Latin continued

Skills being tested:

- Ability to understand an unseen Latin text.
- Ability to form Latin sentences from English originals.
- Literary criticism of an unseen text.

Modern Languages – French/German/Spanish

Structure of paper:

The language papers in French, German and Spanish include:

- Comprehension exercises
- Grammar exercises
- An essay in the target language

Required knowledge:

Students will normally be expected to answer reading comprehension questions in the target language and in English on a variety of GCSE themes. We expect students to show awareness of GCSE grammar and the ability to manipulate it. The essay will focus on one of the current GCSE themes. We are aware that candidates have been studying languages for different amounts of time and so we look for potential. Our ideal candidate is one that has very secure and accurate knowledge of what they have covered so far.

Skills being tested:

- Reading comprehension - the ability to read for detail and for gist.
- Grammatical knowledge – students are advised to consult the list of grammar requirements for GCSE in their chosen language.
- Writing - the ability to write a detailed, focused and accurate essay in the target language containing a wide range of simple and complex structures, and a wide range of vocabulary appropriate to the task.

Music

Structure of paper:

- Performance on main instrument: 10 minutes.
- Aural tests: 10 minutes.
- Listening Skills: 20 minutes.
- Essay: 20 minutes.

Required knowledge:

- Knowledge to roughly ABRSM Grade V music theory level.
- Performing ability of ABRSM Grade V or above.
- Experience of GCSE level listening skills.

Skills being tested:

- Performing ability; demonstrating secure technical control through a musical, convincing and assured performance.
- Aural skills: recognition of cadences, notating a melody from listening, aural identification of intervals, etc.
- Listening skills: recognising instruments, time signatures, textures, rhythms, composition devices, etc.
- Essay: writing style and ability to organise and structure extended prose.

Physics

Structure of paper:
- Multiple Choice: 20 marks
- Structured Short Written Answers: 40 marks

Required knowledge:
- Standard GCSE formulae and units need to be learnt (and will not be provided).
- Knowledge and understanding of electricity, waves, forces and motion and energy at GCSE level.

Skills being tested:
- Knowledge of key physics facts.
- Understanding of physics principles and ability to apply them.
- Ability to perform calculations using information provided.
- Ability to construct logical, structured written explanations.

Physical Education

Structure of paper:
Three sections are examined:
- Applied Anatomy and Physiology
- Health, Fitness & Well Being
- Socio-cultural Issues & Sports Psychology

Each section is broken down into multiple choice and short structured questions, with 20 marks available for each section.

Required knowledge:
- Standard GCSE Physical Education syllabus knowledge. The paper covers a variety of areas on anatomy and physiology, health, fitness, well-being, socio-cultural issues and sports psychology.
- These areas can be further broken down into the following topics:
    - The skeletal, muscular, cardiovascular and respiratory systems
    - The effects of exercise on the body, principles of training, components of fitness, types of training
    - Injury prevention
    - Nutrition, health and well-being
    - Performance enhancing drugs
    - Factors affecting participation in sport: media, sponsorship, skill, motivation, mental preparation and SMART goal setting.

Skills being tested:
- Application of theoretical knowledge to practical activities.
- Ability to demonstrate a topical and relevant knowledge of current issues is sport and physical education.

Religious Studies (Philosophy & Theology)

Structure of paper:
- A 2, 4, 6, 8 and 12 mark question.
- One of each question will be on the paper.
- These questions will ask about religious belief. The candidate may refer to philosophical or ethical ideas where relevant.

Required knowledge:
GCSE-level knowledge of religion (the most commonly studied areas at GCSE level). Philosophy and Ethics can be referred to throughout the paper where the candidate sees fit.

Religious Studies (Philosophy & Theology) continued

Skills being tested:

- Knowledge of religious beliefs and teachings. Knowledge of Philosophy and Ethics can be used where the candidate feels appropriate.
- Understanding of differences in religious belief and practice and how this may influence an individual.
- The ability to form a coherent and persuasive argument using analysis and evaluation, using precise technical terminology.

Theatre Studies

Structure of paper:

A one-hour paper

Two questions will be set:

- Practical work reflection: an essay that will ask candidates to reflect on their strengths and relative weaknesses as a *performer* or *designer* in one previous production, or extract from a play, in which they have been involved (30 minutes).
- Live Theatre Evaluation: an essay that requires analysis of a professional theatre production. This can be from a digital platform, such as Digital Theatre+ (30 minutes).

  In their answer candidates should refer to the statement and describe **key moments** from at least one actor's performance. They can also make reference to any, or all, of the following production elements: set; lighting; sound; special effects; costume and/or make-up.

Required knowledge:

- GCSE-level knowledge of subject specific terminology.
- A live theatre performance experience that can be recalled in detail.

Skills being tested:

- The ability to apply subject specific language accurately and purposefully.
- The ability to evaluate and analyse personal performance/design skills.
- Analysis of production elements.
- The ability to write clearly and concisely in a well-structured and expressive manner.