

## 11+ PAST PAPER PACK

# Alleyn's Oakfield 11+ Maths

## Complete Past Paper Pack

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## **11+ MATHEMATICS**

## **SAMPLE EXAMINATION PAPER 1**

30 minutes.

## Section A - MULTIPLE CHOICE

Circle the correct answer to the questions in this section.

1. The perimeter of a square is 36 cm. What is the **area** of the square?

- A:  $36 \text{ cm}^2$       B:  $81 \text{ cm}^2$       C:  $18 \text{ cm}^2$       D:  $72 \text{ cm}^2$       E:  $100 \text{ cm}^2$

2. Which of these numbers is the smallest?

- A: 0.5      B: 0.0501      C: 0.051      D: 0.499      E: 0.49

3. One of the angles in an **isosceles** triangle is  $102^\circ$ , which of these is a possible size of one of the other angles in the triangle?

- A:  $39^\circ$       B:  $102^\circ$       C:  $98^\circ$       D:  $78^\circ$       E:  $129^\circ$

4. Which of these fractions is equal to 0.8?

- A:  $\frac{1}{8}$       B:  $\frac{4}{5}$       C:  $\frac{0.8}{10}$       D:  $\frac{8}{100}$       E:  $\frac{5}{4}$

5. Work out  $41 - 7 + 9 \times 2$

- A: 84      B: 50      C: 16      D: 86      E: 52

## Section B

Show your working when answering these questions

6. Work out  $584 - 326$

.....

7. Work out  $497 \div 7$

.....

8. Work out leaving any fractions in their **simplest** form

b)  $5\frac{4}{11} - 3\frac{8}{11}$

.....

9. Fill in the missing terms of the sequences given by these rules

a) Double the previous term and then subtract 6

4, 2, \_\_\_\_\_, \_\_\_\_\_

b) Add four to the previous term

\_\_\_\_\_, 5, \_\_\_\_\_, 13

b) The square numbers

\_\_\_\_\_, 4, \_\_\_\_\_, 16

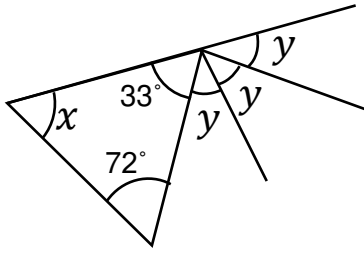
c) The prime numbers

\_\_\_\_\_, 3, 5, 7, \_\_\_\_\_

10. A bag of rice contains 360g. A special offer packet contains an extra 15%.  
Work out how much **extra** rice is in the special offer packet.

.....g

11. Work out the size of the angle  $x$  and angle  $y$  in the diagram.  
The diagram is **not** drawn to scale



$x = \dots\dots\dots^\circ$

$y = \dots\dots\dots^\circ$

12. Work out the mean of 5, 12, 8, 10, 5, 8

.....

- b) Another number is added to the list 5, 12, 8, 10, 5, 8, ?

The new mean is 7. What number was added to the list?

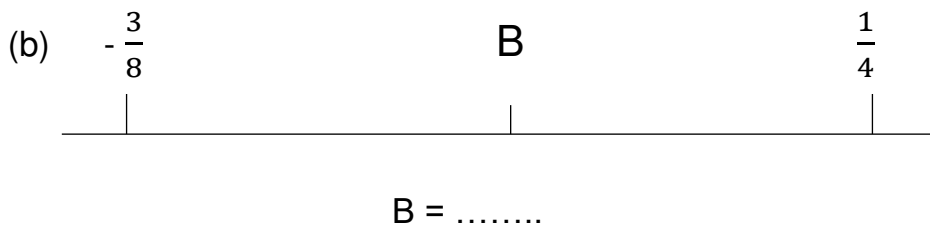
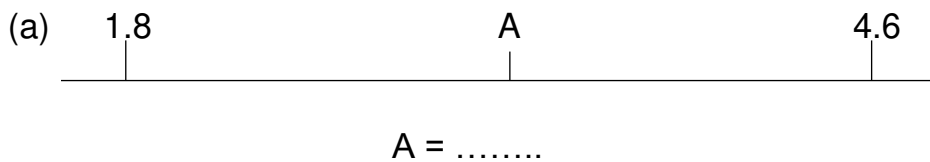
.....

13. There are 54 people in Bright Wheels cycling club.

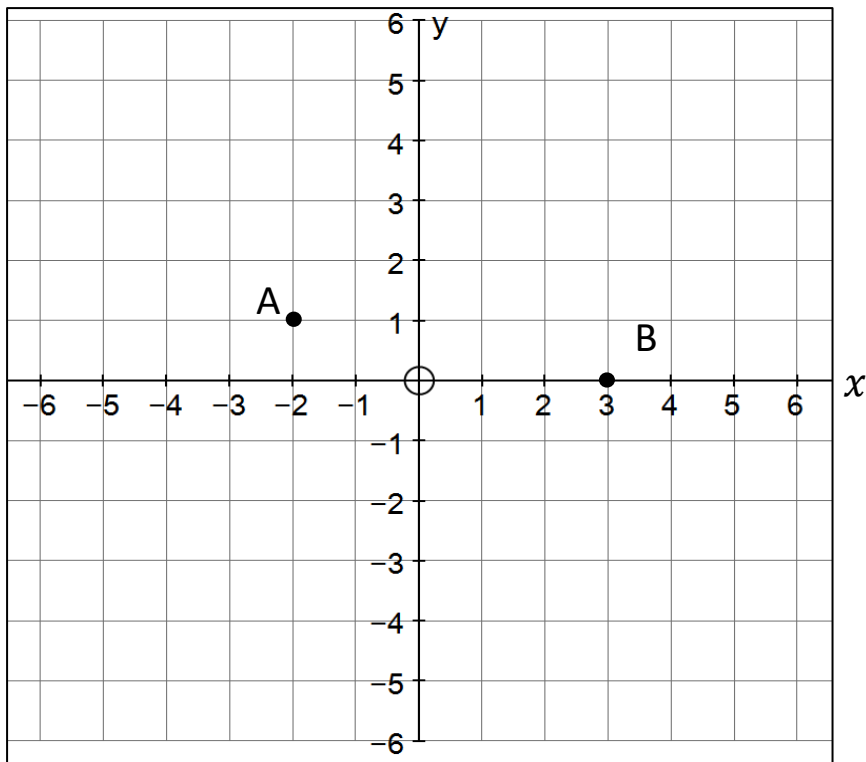
If there are 6 more boys than girls in the club, what is the ratio of boys to girls in the club? Give your answer in its **simplest** form.

boys: girls = .....:.....

14. These pictures show parts of a scale with equal gaps between each marking. What number should replace each letter?



15. Look at the coordinate grid below.



a) Write down the coordinates of point A and point B.

A(....., .....

B(....., .....

b) On the same coordinate grid plot the coordinate C(2, - 2).  
Label the coordinate C

c) A fourth point D has  $x$  coordinate -3.  
The coordinates A, B, C and D are the corners of a parallelogram.

Plot the coordinate D.

d) Reflect the parallelogram ABCD in the  $y$  axis

16.

The remainder when 256 is divided by a number is 6.

This statement in the box is only true for one number between 20 and 30.  
What is the number?

.....

The next question is only worth **one mark**

17. Use the numbers on the cards below to try to make the number **438**.

3

3

5

7

1

2

You must follow these three rules:

1. You can use addition, subtraction, multiplication, division and brackets to make the answer
2. You cannot make a number by grouping cards together. For example: you cannot make 75 by placing the 7 and 5 card next to each other.
3. You must use each number exactly once.

Use the space below for any rough working.

If you successfully make 437 write clear working out to show the steps in the solution box below, otherwise leave the solution box **empty**.

***Rough working***

**Solution**

# Paper Notes: 11+ Maths Sample Paper (11+ Maths Sample Paper)

Compiled by [SATs-Papers.co.uk](https://www.SATs-Papers.co.uk) to help you get the most from this paper.

## Overview

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This is a **sample 11+ Mathematics paper** published by **Alleyn's Oakfield**, designed to help students prepare for the 11+ entrance examinations required for entry to selective independent schools. The paper is structured to test the full breadth of mathematical skills expected at the end of Year 6, including arithmetic, fractions, decimals, geometry, algebra, statistics, and problem-solving under timed conditions. Candidates are given **30 minutes** to complete the paper.

The format mirrors real entrance exam conditions, with a mixture of **multiple-choice questions** in Section A and **free-response questions requiring working** in Section B. This balance assesses both quick recognition and deeper understanding. Topics span number operations, percentages, ratio, sequences, angles, coordinates, and logical reasoning. The paper rewards both accuracy and method, encouraging students to show their reasoning clearly.

This sample paper is particularly useful for students applying to London independent schools or grammar schools with 11+ Maths requirements. The variety and difficulty level reflect the standard expected by competitive selective schools, making it an excellent benchmark for revision and exam readiness.

## How this paper is organised

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The paper is divided into two distinct sections. **Section A** comprises **five multiple-choice questions**, each with five possible answers labelled A to E. Students must circle the correct answer. Topics include area and perimeter, ordering decimals, properties of triangles, fraction-decimal equivalence, and order of operations. This section tests rapid recall and conceptual understanding without requiring written working.

**Section B** contains **twelve questions** requiring full written solutions and working. Questions 6 to 8 cover basic arithmetic operations: subtraction, division, and mixed-number subtraction. Questions 9 to 12 involve sequences, percentages, angle geometry, and calculating the mean. Questions 13 to 16 address ratio, scales with fractions and decimals, coordinate geometry with transformations, and division with remainders. The final challenge, **Question 17**, is worth only one mark but requires creative problem-solving to combine six given digits using operations to reach a target number.

The paper totals approximately 17 questions, though some have multiple parts. The layout provides space for working, and students are explicitly instructed to show their methods. No mark allocation is printed on the paper, but the emphasis on working indicates that method marks are awarded alongside accuracy.

## Topics covered

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- Perimeter and area of squares, with conversion between the two measures
- Ordering decimals, including distinguishing between place values in the tenths, hundredths, and thousandths positions
- Properties of isosceles triangles, including angle relationships and the constraint that angles sum to  $180^\circ$
- Fraction-decimal equivalence, converting between fractions and decimals such as  $\frac{4}{5}$  and 0.8
- Order of operations (BIDMAS/BODMAS), particularly multiplication before addition and subtraction
- Subtraction and division of three-digit numbers, with and without remainders
- Subtraction of mixed numbers with common denominators, simplifying the result
- Sequences defined by term-to-term rules: doubling and subtracting, adding a constant, square numbers, and prime numbers
- Percentage increases, calculating 15% of a quantity in a real-world context
- Angle geometry: vertically opposite angles, angles on a straight line, and solving for unknown angles in diagrams
- Mean (average) of a data set, and reverse problems finding a missing value given a new mean
- Ratio in context, expressing the relationship between two groups in simplest form
- Reading scales with equal intervals, interpolating values for decimals and fractions on a number line
- Coordinate geometry: plotting points in all four quadrants, identifying coordinates, constructing a parallelogram from given vertices, and reflecting shapes in the y-axis
- Division with remainders and logical reasoning to identify a divisor that satisfies a specific remainder condition
- Creative arithmetic problem-solving using all four operations and brackets to reach a target number from given digits

## How to use this paper for revision

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- Revise square numbers up to at least  $15^2$  and learn to recognise them quickly, as they appear in both perimeter-area conversions and sequence questions.
- Practise converting between fractions, decimals, and percentages fluently. Being able to recall common equivalents (such as  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{3}{4}$ ,  $\frac{4}{5}$ ) saves time.
- Memorise the first ten prime numbers (2, 3, 5, 7, 11, 13, 17, 19, 23, 29) and understand what makes a number prime.
- Work through angle problems systematically: label all known angles, use angle facts (angles on a straight line sum to  $180^\circ$ , vertically opposite angles are equal), and solve step by step.
- For mean problems, remember that  $\text{mean} = \text{total} \div \text{count}$ . Reverse problems require you to work backwards: multiply the mean by the count to find the total, then subtract known values.
- When working with coordinates, always write the x-coordinate first, then the y-coordinate. Sketch axes if needed to visualise transformations like reflections.
- For the final problem-solving challenge, try different combinations methodically. Start with larger operations (multiplication or division) to build towards the target, then adjust with addition or subtraction.

## Common mistakes to avoid

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- Confusing perimeter and area: remember that perimeter is the distance around the edge, while area is the space inside. For a square,  $\text{area} = \text{side}^2$ , not  $\text{side} \times 4$ .
- Misapplying order of operations: students often work left to right without doing multiplication first. In  $41 - 7 + 9 \times 2$ , calculate  $9 \times 2 = 18$  before subtracting or adding.
- Assuming all angles in an isosceles triangle are equal. An isosceles triangle has only two equal angles; if one angle is  $102^\circ$ , the other two must sum to  $78^\circ$ , so each is  $39^\circ$ .
- Adding or subtracting mixed numbers without converting to improper fractions or handling whole numbers and fractions separately, leading to errors in borrowing or carrying.
- Forgetting to simplify ratios. If there are 30 boys and 24 girls, the ratio 30:24 must be reduced to 5:4 by dividing both sides by the highest common factor.
- Plotting coordinates incorrectly by reversing x and y, or misreading negative values. Always check which axis is which and count carefully from the origin.
- Misunderstanding remainders: if  $256 \div n$  has remainder 6, then  $256 - 6 = 250$  must be exactly divisible by n. Students often divide 256 instead of 250.

## Exam technique

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Begin with **Section A** to secure quick marks. Multiple-choice questions reward accuracy and speed, so trust your first instinct if you are confident, but eliminate obviously incorrect answers if unsure. Avoid spending more than one minute per question in this section. If stuck, move on and return later rather than lingering and losing time.

In **Section B**, always show your working clearly, even for straightforward calculations. Examiners award method marks when the final answer is wrong but the approach is sound. Use the space provided and write legibly. For multi-step problems like the mean or ratio questions, break the problem into parts: find totals, then divide or simplify. Check that your final answer makes sense in context (for example, the number of boys and girls should add to 54).

Save **Question 17** until last. It is worth only one mark, so do not spend ten minutes on it at the expense of higher-value questions. If you finish early, use any remaining time to attempt it or to check your answers throughout the paper. For coordinate and geometry questions, sketching a quick diagram in rough can prevent errors. Finally, read every question twice: small words like 'extra' or 'simplest form' change what the question is asking.

## What to revise alongside this paper

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Students should consolidate their understanding of **fractions, decimals, and percentages** as a connected family of representations. Practise converting between all three forms and solving word problems involving each. Work on **properties of quadrilaterals** (rectangles, parallelograms, trapeziums, rhombuses) and their angle and symmetry properties, as these often appear in coordinate geometry and transformation questions.

Review **algebraic thinking** through sequences and function machines. Understand how to express patterns using nth term rules, and practise finding missing terms in linear and non-linear sequences. Strengthen **mental arithmetic** by working without a calculator on problems involving multiples, factors, and divisibility tests. This builds speed and confidence for timed papers.

For students aiming at the most competitive schools, explore **problem-solving puzzles** such as logic grids, digit problems, and multi-step word problems. Resources like UKMT Junior Maths Challenge past papers provide excellent stretch material. Finally, practise **drawing and interpreting diagrams** for geometry and data-handling questions, as visual reasoning is a key skill at 11+ level.

## Key terms

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**Perimeter, Area, Isosceles triangle, Order of operations (BIDMAS/BODMAS), Mixed number, Improper fraction, Term-to-term rule, Square number, Prime number, Percentage, Vertically opposite angles, Mean (average), Ratio, Coordinate, Parallelogram, Reflection, Remainder**

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## **11+ MATHEMATICS**

## **SAMPLE EXAMINATION PAPER 2**

30 minutes.

## Section A - MULTIPLE CHOICE

Circle the correct answer to the questions in this section.

1. Which of these numbers is a multiple of 15?

A: 5

B: 30

C: 1

D: 40

E: 160

2. 12 is  $\frac{3}{4}$  of what number?

A: 4

B: 3

C: 9

D: 16

E: 36

3. The most likely height of a mug is?

A: 30 cm

B: 9 mm

C: 95 mm

D: 3cm

E: 950 mm

4. If I buy 5 pencils costing 54p each. How much change do I get from £5?

A: £2.70

B: £3.30

C: £4.46

D: £2.30

E: £3.70

5. How many minutes are there in 1 and a three-quarter hours?

A: 105

B: 175

C: 125

D: 85

E: 1.75

## Section B

Show your working when answering these questions

6. Work out  $2584 + 218$

.....

7. Work out  $43 \times 59$

.....

8. Work out leaving any fractions in their **simplest** form

c)  $\frac{5}{8}$  of 40

.....

9. Put the following numbers in order of size from smallest to biggest

$$\frac{5}{6}, \quad \frac{2}{3}, \quad 0.03, \quad 0.8, \quad \frac{13}{18}$$

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

10. A hotel rents out their function room for weddings, the cost of hiring the room is £600 plus £50 for each guest attending.

a) Fill in the missing values in the formula to work out the cost of hiring the hotel for a wedding.

Total Cost = \_\_\_\_\_ + \_\_\_\_\_ × number of guests

b) How much would a wedding for 70 guests cost?

£.....

c) The total cost for a wedding is £6100. How many guests are attending the wedding?

.....guests

11. The numbers on the cards go up in equal steps. For each sequence write down what number should replace the question mark.

a)

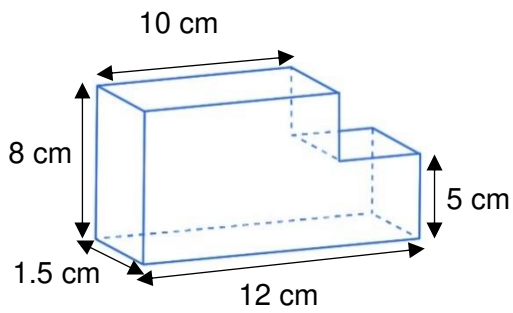
.....

b)

.....

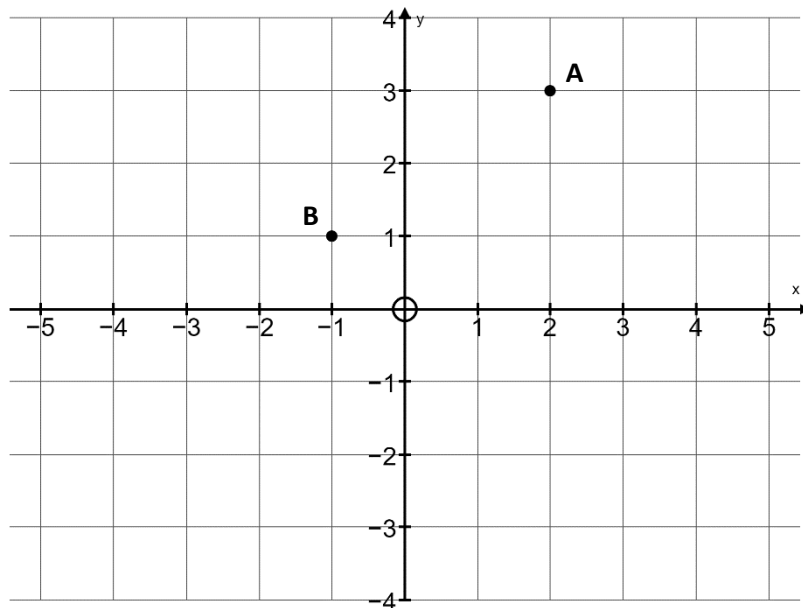
c)

12. Find the volume of the prism in the diagram. The diagram is **not** drawn to scale



.....cm<sup>3</sup>

13. Look at the coordinate grid below



a) Write down the coordinates of the points A and B

A (....., ..... )    B (....., .....)

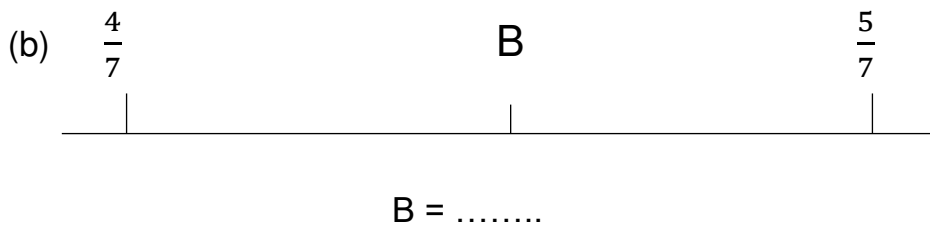
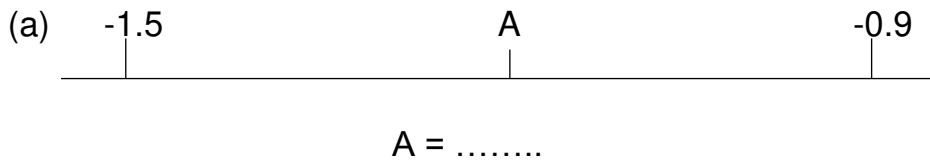
b) On the same grid plot the coordinate (-1, -2). Label this coordinate C.

c) The three coordinates join to make triangle ABC. Reflect triangle ABC in the  $y - axis$

d) Each square on the grid represents one square unit of area. What is the area of triangle ABC in square units?

.....square units

14. These pictures show parts of a scale with equal gaps between each marking. What number should replace each letter?



15. A train travels at constant speed, if the train travels 90km in 30 minutes. How long will it take the train to travel 150 km?

.....minutes

- 16.** A number has 6 digits. The last digit is 4. If the 4 is moved to the front of the number it becomes 4 times greater. What is the number?

.....

17. This crossword has numbers instead of letters, fill in the cross number to make all the clues correct. There is more than one way it can be correctly completed.

1	2	3
4		
5		

**Across Clues**

- 1) An even cube number
- 4) The square of a prime number
- 5) A prime number

**Down Clues**

- 1) Double a square number
- 2) A prime number
- 3) A prime number

# Paper Notes: 11+ Maths Sample Paper (11+ Maths Sample Paper)

Compiled by [SATs-Papers.co.uk](https://www.SATs-Papers.co.uk) to help you get the most from this paper.

## Overview

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This is **Sample Examination Paper 2**, an 11+ mathematics practice paper published by **Alleyn's Oakfield**. The paper is designed for students preparing for Year 7 entry and tests a broad range of mathematical skills typical of the **11+ entrance level**. With a time limit of **30 minutes**, it combines quick-fire multiple-choice questions with longer written problems requiring clear working and reasoning.

The paper covers fundamental arithmetic, fractions, measurement, algebra, geometry, and problem-solving. Questions range from straightforward calculation to multi-step challenges involving coordinate geometry, volume, and number puzzles. The format mirrors real entrance exam conditions, giving students valuable practice in both content and exam technique.

This paper suits students aiming for independent or selective grammar schools, particularly those seeking exposure to the style and difficulty level typical of competitive 11+ assessments. The inclusion of challenging final questions (such as the digit-rearrangement puzzle and the number crossword) makes it particularly useful for stretching able mathematicians and building confidence with unfamiliar problem types.

## How this paper is organised

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The paper divides into two distinct sections. **Section A** comprises five multiple-choice questions, each offering five answer options labelled A to E. These questions test quick recall, estimation, and basic manipulation of numbers, fractions, and units. Students circle the correct answer directly on the paper.

Section B contains **twelve free-response questions** (questions 6 to 17), requiring written working and final answers in the spaces provided. Marks are not explicitly stated on the paper, but the variety of question types (straightforward calculation, fraction simplification, ordering mixed numbers, formula completion, coordinate plotting, volume calculation, and logic puzzles) suggests a range of weightings. Some questions have multiple parts, such as question 10 with three sub-parts on algebraic reasoning and inverse operations.

The **30-minute time limit** is tight, averaging roughly 105 seconds per question. Students must balance speed in Section A with careful working in Section B, where errors in early steps can cascade through multi-part questions. The paper ends with

two challenging problems (questions 16 and 17) that reward persistence and lateral thinking.

## Topics covered

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- Multiple choice questions on multiples, fractions of quantities, estimation of real-world measurements, and time unit conversions
- Column addition and multiplication of multi-digit whole numbers with working shown
- Finding fractions of amounts and simplifying answers to lowest terms
- Ordering mixed sets of fractions, decimals, and improper fractions by converting to common denominators or decimal equivalents
- Constructing and applying linear formulae in real-world contexts (wedding venue hire costs)
- Inverse operations and rearranging algebraic equations to find unknown values
- Identifying patterns in arithmetic sequences and calculating missing terms from given increments
- Calculating the volume of composite 3D shapes (L-shaped prisms) by decomposition or formula
- Reading and plotting coordinates in four quadrants, performing reflections in the y-axis, and calculating areas of triangles on grids
- Interpreting scales with equal intervals to find missing values in both decimal and fractional contexts
- Proportional reasoning and ratio problems involving distance, speed, and time
- Advanced number puzzles requiring systematic trial or algebraic manipulation (six-digit cyclic number problem)
- Constraint-based logic puzzles using number properties (cube numbers, squares of primes, prime numbers, doubles of squares)

## How to use this paper for revision

---

- Practise multiplication tables up to  $12 \times 12$  fluently to speed up questions 4, 7, and 15 without needing extended working.
- When ordering fractions and decimals (question 9), convert everything to decimals first or find a common denominator of 18 to compare accurately.
- For volume problems (question 12), sketch the prism from different angles and break it into two rectangular blocks ( $10 \times 8 \times 1.5$  and  $10 \times 5 \times 12$  minus overlap) to avoid errors.
- In coordinate geometry (question 13), plot points carefully by counting squares rather than estimating, and check reflections by measuring perpendicular distance to the y-axis.
- For algebraic word problems (question 10), write the formula in full before substituting numbers, and rearrange carefully by reversing operations one step at a time.
- Tackle the number puzzles (questions 16 and 17) by setting up equations or testing small examples systematically rather than guessing randomly.
- Read measurement questions (question 3) with care: convert all options to the same unit (millimetres or centimetres) before choosing the most sensible answer.

## Common mistakes to avoid

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- Choosing 160 in question 1 because it contains a 5, forgetting that multiples of 15 must be divisible by both 3 and 5, so 30 is correct.
- Misreading '12 is three-quarters of what number' as '12 multiplied by three-quarters' instead of recognising  $12 \div (3/4) = 16$ .
- In question 4, calculating  $5 \times 54 = 270p$  but forgetting to subtract from 500p, or misplacing the decimal point in the final answer.
- Ordering question 9 by size of numerator or denominator alone, rather than converting  $13/18 \approx 0.72$ ,  $5/6 \approx 0.83$ , and  $2/3 \approx 0.67$  to compare properly.
- In question 10c, dividing 6100 by 50 directly and forgetting to subtract the fixed £600 room hire cost first, leading to 110 guests instead of 110 guests.
- Calculating volume in question 12 by multiplying all visible dimensions without decomposing the L-shape, producing  $10 \times 12 \times 8 \times 5 \times 1.5$  nonsense instead of splitting into two blocks.
- Reflecting triangle ABC across the wrong axis (the x-axis instead of the y-axis) because of haste, or counting area by perimeter instead of using  $\frac{1}{2} \times \text{base} \times \text{height}$ .

## Exam technique

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Begin with **Section A**, aiming to complete all five multiple-choice questions in under six minutes total. If uncertain, eliminate obviously wrong answers (such as 950 mm for mug height) and make an educated guess rather than leaving blanks. Check arithmetic quickly by estimation: for question 4,  $5 \times 50 = 250\text{p}$ , so change from £5 should be roughly £2.50.

In **Section B**, show all working even for questions like 6 and 7, as partial credit often applies in real entrance exams. Use the grid provided for question 13 with precision: plot point C by counting along the x-axis to -1 and down the y-axis to -2, then reflect by keeping the y-coordinate fixed and changing the sign of the x-coordinate. For question 8c, simplify  $\frac{5}{8} \times 40$  by cancelling the 8 into 40 first (giving  $5 \times 5 = 25$ ) to avoid large fractions.

Leave the final two questions (16 and 17) until last if time is short, but attempt them if possible: question 16 rewards systematic trial (let the original number be ABCDE4, then  $4ABCDE = 4 \times ABCDE4$ , which sets up an equation), and question 17 allows multiple valid solutions, so any correct crossword earns full marks. Budget about two minutes per Section B question, saving three minutes at the end to check answers and ensure units ( $\text{cm}^3$ , minutes, pounds) are stated where required.

## What to revise alongside this paper

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Students should consolidate **fraction arithmetic** (addition, subtraction, multiplication, and division of fractions, plus converting between improper fractions and mixed numbers) to handle questions like 2 and 8 confidently. Practise **BIDMAS order of operations** and substitution into formulae to prepare for question 10 and similar algebraic contexts.

Geometry skills are essential: revise **properties of 2D and 3D shapes**, including how to decompose composite solids into simpler blocks for volume calculations. Work on **transformations** (reflection, rotation, translation) on coordinate grids, ensuring fluency with all four quadrants and negative coordinates. Strengthen **ratio and proportion** techniques, particularly setting up and solving equations like distance = speed  $\times$  time, which underpins question 15.

For the challenge questions, explore **number theory fundamentals** (prime factorisation, square and cube numbers, divisibility rules) and practise **logical reasoning puzzles** that combine multiple constraints. Consider working through similar problem-solving resources (such as UKMT Junior Maths Challenge past papers or Nrich activities) to build resilience with unfamiliar question types and develop systematic trial-and-improvement strategies.

## Key terms

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**Multiple, Fraction of a quantity, Simplest form, Common denominator, Linear formula, Inverse operation, Arithmetic sequence, Prism, Volume, Coordinates, Reflection, Axis of symmetry, Proportional reasoning, Cube number, Square number, Prime number**

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# 11+ ENTRANCE EXAMINATION SYLLABUS

Entry to Alley'n's is primarily academically selective by examination and then interview. There are up to three stages to the 11+ process. With the exception of candidates residing overseas, all candidates will visit Alley'n's for assessment.

## Stage 1: Entrance examinations in English, Mathematics and Reasoning

### English (45 mins)

It is essential that time is managed carefully and we suggest 10 minutes for **reading** and 35 minutes for completing the tasks. Candidates must write in black or blue pen/ biro (**not** pencil).

The examination consists of some multiple-choice comprehension questions and a directed writing task. Answers for this section are marked in pencil on a pre-printed multiple-choice answer sheet where the selected answer is marked in the correct box. For example, see below.

	A	B	C	D
Q1	X			
Q2			X	
Q3		X		

In the written task, candidates will be asked to produce a narrative or descriptive response that continues the reading passage. Evidence of detailed comprehension, clarity, fluency and accuracy of written expression are assessed; imaginative and linguistic flair will also be rewarded.

### Mathematics (30 minutes)

Candidates should bring pen, pencil, ruler and eraser to the examination; calculators are not needed.

The examination is largely set on the National Curriculum topics listed below. The final questions on the paper are harder, extension questions and are self-explanatory.

#### Number and algebra

- Understand place value.
- Find factors and multiples of numbers.
- Using factor pairs.
- Recognise prime numbers and square numbers.
- Understand square and cube numbers.
- Order, add and subtract negative numbers.
- Use all four operations with decimals to two places.
- Reduce a fraction to its simplest form by cancelling.
- Compare and order fractions greater than 1
- Long division.

- Add, subtract and place fractions in order using common denominators.
- Add and subtract proper fractions and mixed numbers
- Multiply proper fractions and mixed numbers by whole numbers
- Understand and use order of operations.
- Solve simple problems involving ratio and direct proportion.
- Write percentages as fractions; fractions as decimals.
- Find simple percentages of whole numbers in context.
- Calculate fractions of shapes and quantities.
- Solve problems that involve multiplying and dividing any three-digit number by any two-digit number.
- Check solutions by applying inverse operations or estimate answers using approximations.
- Construct and use simple formulae.
- Use brackets appropriately.
- Use and interpret coordinates in all four quadrants.
- Convert metric units.
- Convert between miles and kilometres.
- Read scales, including analogue and digital clocks.
- Work with units of time (seconds, minutes, hours, days, weeks).

- Solve problems in context, e.g. money.
- Use letters to represent unknowns.
- Generate and describe linear sequences.

### Shape, space and measures

- Measure and draw angles to the nearest degree.
- Know the sum of angles in a triangle, sum of angles on a line and sum of angles at a point.
- Identify all the symmetries of 2D shapes.
- Plot points in all 4 quadrants.
- Make sensible estimates of a range of measures in relation to everyday situations.
- Solve simple problems involving speed, distance, time.
- Finding area/perimeter of compound shapes.
- Use formulae for area/volume of shapes.
- Calculate areas of triangles and parallelograms.
- Calculate the volume of 3D shapes.
- Names radius/diameter and know relationship.
- Reflection and translation of shapes.

### Handling data

- Interpret graphs and diagrams, including pie charts.
- Calculate and interpret the mean as an average.

Decimal Separators: The symbol used to separate the integer part of a decimal from its fractional part is called the decimal point. Candidates from overseas should be aware that in Britain the decimal point is denoted by a period (eg 31.241). In some countries the notation is different: for example, many European countries use a comma in place of the decimal point (e.g. 31,241). Candidates are expected to be aware of the British system for decimal points and should note that questions will be set in this style; however, the candidate's own answer may be written in the style that is familiar to them.

## Verbal, Non-Verbal & Spatial Reasoning Test (multiple-choice) (45 minutes)

Verbal Reasoning tests mainly involve reasoning with words and typically include a variety of question types that involve the production of, use of, and relations between, words.

Non-Verbal Reasoning tests involve reasoning with abstract figures. Some questions, for example, might look at relationships between shapes and sequences of shapes, by identifying common features from a set of figures and applying them to a new figure.

Spatial Reasoning tests are similar to non-verbal reasoning tests in that they involve reasoning with abstract figures. Spatial Reasoning question types typically involve the mental creation, retention and manipulation of visual images.

Answers are marked in pencil on a pre-printed multiple-choice answer sheet where the selected answer is marked in the correct box. For example, see below.

	A	B	C	D
Q1	X			
Q2			X	
Q3		X		

Any commercial or freely available practice questions will be useful preparation for this test, noting that the exact types of questions covered and/or the level of difficulty may be different from the Alleyn's test.

## **Stage 2: Group activity and one-to-one interview**

Candidates reaching an acceptable standard in the entrance examination are invited back to school to attend our interview day, which consists of two elements: candidates are assessed in small groups and in a one-to-one interview. Parents are not interviewed. Candidates will be asked about their interests in and out of school, and we will be seeking to identify those best suited to the education offered at Alleyn's. An invitation to an interview does not guarantee the subsequent offer of a place.

## **Stage 3: For academic scholarship candidates only**

Following the group activity and one-to-one interviews, shortlisted academic scholarship candidates will be invited to return to Alleyn's for a series of Academic Scholarship workshops.

## **Examination Concessions and Access Arrangements**

We allow the use of a word processor and/or extra time as appropriate. Candidates must provide a letter from their current school setting out their normal way of working. For further details please refer to our Policy on Entrance Examination Concessions and Access Arrangements.

## **For further information**

Visit the school website [www.alleyns.org.uk](http://www.alleyns.org.uk) or contact the Registrar's office: telephone 020 8557 1478 or email [registrar@alleyns.org.uk](mailto:registrar@alleyns.org.uk)

# Paper Notes: 11+ Maths Question Paper (11+ Maths Past Paper)

Compiled by [SATs-Papers.co.uk](https://www.SATs-Papers.co.uk) to help you get the most from this paper.

## Overview

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This document is the official **11+ Entrance Examination Syllabus** published by **Alleyn's School**, setting out the complete content and structure of the entrance assessments for Year 7 entry. It describes a three-stage selection process that includes written examinations in **English, Mathematics, and Reasoning**, followed by group activities and individual interviews, and culminating in academic scholarship workshops for shortlisted candidates.

The syllabus provides detailed specifications for each examination component, including time allocations, topics covered, and answer formats. The **Mathematics paper** is a 30-minute test covering the National Curriculum, with topics spanning number and algebra, shape and measures, and data handling. Calculators are not permitted, and the final questions include harder extension material. The English paper combines multiple-choice comprehension with creative writing, whilst the Reasoning test integrates verbal, non-verbal, and spatial reasoning in a single 45-minute multiple-choice assessment.

This syllabus is designed for candidates applying to Alleyn's and their families, providing transparency about assessment content and helping students to prepare effectively. It includes practical guidance on decimal notation for overseas candidates, access arrangements for students with additional needs, and clear instructions on equipment and writing materials required on the day.

## How this paper is organised

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The syllabus document is organised into three main stages of the **11+ entrance process**. Stage 1 describes the written examinations: **English (45 minutes)**, structured with 10 minutes recommended for reading and 35 minutes for answering multiple-choice comprehension questions and a directed writing task; **Mathematics (30 minutes)**, covering National Curriculum topics with extension questions at the end; and **Verbal, Non-Verbal & Spatial Reasoning (45 minutes)**, a combined multiple-choice test assessing reasoning with words and abstract figures.

Stage 2 outlines the interview day, consisting of group activities and one-to-one interviews for candidates who reach an acceptable standard in the written

examinations. Stage 3 applies only to shortlisted academic scholarship candidates, who are invited to attend additional workshops.

The Mathematics syllabus is presented thematically across three strands: **Number and Algebra**, **Shape, Space and Measures**, and **Handling Data**. Each strand lists specific skills and topics in bullet-point form. Practical information on examination concessions, access arrangements, and contact details for the Registrar's office appears at the end of the document.

## Topics covered

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- Place value, factors, multiples, prime numbers, square and cube numbers in the Number and Algebra strand
- Operations with negative numbers, decimals to two places, proper fractions, mixed numbers, and long division
- Order of operations, ratio, direct proportion, and percentage-fraction-decimal conversion
- Coordinate geometry in all four quadrants and linear sequences using algebraic notation
- Angles in triangles, on a line, and at a point; measuring and drawing angles to the nearest degree
- Area and perimeter of compound shapes, volumes of 3D shapes, areas of triangles and parallelograms using formulae
- Symmetries of 2D shapes, reflection and translation transformations, and properties of circles (radius and diameter)
- Metric unit conversion, miles to kilometres conversion, reading scales including analogue and digital clocks, and speed-distance-time problems
- Interpreting graphs and diagrams, including pie charts, and calculating the mean as an average
- Verbal reasoning involving word production, usage, and relationships; non-verbal and spatial reasoning with abstract figures, sequences, and mental manipulation of visual images

## How to use this paper for revision

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- Practise multi-step arithmetic without a calculator, focusing on long division, fraction operations, and order of operations with brackets to build fluency and accuracy.
- Review angle facts systematically: angles in triangles sum to  $180^\circ$ , angles on a straight line sum to  $180^\circ$ , and angles at a point sum to  $360^\circ$ .
- Work through timed reasoning practice papers from a variety of publishers to familiarise yourself with different question formats and improve speed under exam conditions.
- Strengthen mental arithmetic with negative numbers and decimals by creating your own number lines and practising addition and subtraction in context.
- Revise formulae for area and volume of common shapes (rectangles, triangles, parallelograms, cuboids) and practise applying them to compound shapes broken into simpler components.
- Read a variety of fiction and non-fiction texts to develop comprehension stamina, paying attention to inference, tone, and how writers use language for effect.
- Practise continuing a narrative or descriptive passage in your own writing, aiming to match the style and tone of the original whilst demonstrating creativity and accuracy.

## Common mistakes to avoid

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- Forgetting to simplify fractions to their lowest terms after calculations, or leaving improper fractions as final answers instead of converting them to mixed numbers.
- Misreading scales on graphs, clocks, or measuring instruments by failing to check the value of each interval before recording an answer.
- Rushing the reading time in the English paper and missing key details needed for both the comprehension questions and the continuation writing task.
- Confusing the formulae for area and perimeter, particularly for compound shapes where students forget to add all outer edges for perimeter calculations.
- Making careless sign errors when working with negative numbers, especially in subtraction where subtracting a negative is equivalent to addition.
- Spending too long on difficult reasoning questions instead of moving on and returning to them later, resulting in unanswered easier questions at the end.

## Exam technique

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Begin each examination by reading the instructions carefully and noting the time allocation. In the **English paper**, use the full 10 minutes for reading the passage and

planning your response; underline key details and think about tone and structure before starting to write. For the multiple-choice comprehension, eliminate obviously incorrect answers first, then choose the option that is most fully supported by the text.

In the **Mathematics paper**, work through the questions in order, but do not get stuck on a single problem. Leave challenging questions and return to them after completing the easier material. Show all working clearly, even when it is not explicitly requested, as this helps you spot errors and may earn partial marks if the final answer is incorrect. Check your answers by using inverse operations or by estimating to see if your result is reasonable.

For the **Reasoning test**, pace yourself to attempt all questions within the 45 minutes. If you are unsure of an answer, make an educated guess rather than leaving it blank, as there is no penalty for incorrect answers in multiple-choice formats. Practise identifying question types quickly so you can apply the appropriate strategy without wasting time rereading instructions.

## What to revise alongside this paper

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Students preparing for the Alleyn's 11+ Mathematics examination should consolidate their understanding of **fractions, decimals, and percentages**, ensuring they can convert fluently between the three forms and apply them in word problems. Revisiting **arithmetic with negative numbers** and practising multi-digit multiplication and division will strengthen core calculation skills.

For shape and measure topics, review the properties of **quadrilaterals, polygons**, and **3D solids** such as prisms and pyramids. Practise constructing accurate drawings with a protractor and ruler, and apply geometric reasoning to multi-step problems involving angle facts. Work on **algebraic thinking** by solving simple equations and constructing expressions to represent unknown quantities.

To develop reasoning skills, explore a range of **logic puzzles, code-breaking tasks**, and **pattern-completion exercises** that build visual and verbal problem-solving confidence. Reading widely across genres will support comprehension and writing fluency, helping candidates tackle the English paper with assurance.

## Key terms

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**Place value, Factor pairs, Prime numbers, Square and cube numbers, Order of operations, Ratio and proportion, Lowest common denominator, Compound shapes, Perimeter and area formulae, Volume of 3D shapes, Coordinate geometry, Reflection and translation, Mean average, Verbal reasoning, Non-verbal reasoning, Spatial reasoning**

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For more free 11+ practice papers, past papers and online practice tests, visit [SATs-Papers.co.uk](https://www.SATs-Papers.co.uk).