

11+ PAST PAPER PACK

Tonbridge School 11+ Maths

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Guidance for candidates preparing for the Year 7 Entrance Paper in Mathematics

As the candidates for this exam come from a wide variety of schools which follow different Mathematics courses, we do not expect candidates to have followed a specific syllabus.

The paper is set on what the majority of year 7 pupils should have met. The paper will be about 75% of routine examples on techniques and about 25% will be more stretching examples on the same techniques consisting of either more sophisticated problems, multi-stage problems or problems where the method may not be as clear.

The paper will be non-calculator and take 60 minutes, with 100 marks available.

Candidates will need a pen, pencil, ruler and rubber but will not need either a protractor or a compass.

Calculators should not be brought.

The questions will be taken from the following topics:

Number:

Addition, subtraction, multiplication and division of whole numbers, fractions and decimals.

Simple percentages.

Use of positive indices and square and cube roots.

Number sequences (but not including the n th term).

Ratio and Proportional Reasoning.

Algebra:

Simple algebraic expressions (substitution into, simplifying including simple factorising).

Linear Equations (solution but not formation).

Geometry:

Areas and perimeters of individual or compound shapes.

Volumes of cuboids.

Angle properties (parallel lines and angle sum of triangles and quadrilaterals).

Symmetry and Classifying Triangles and Quadrilaterals.

Names of pentagons and hexagons.

Processing Data:

Averages and range of data.

Statistical Charts (Frequency tables, bar charts, pictograms, interpretation of pie charts with angles given).

Topics link to other syllabuses that may be followed:

For those schools following the Common Entrance Syllabus this may be viewed as the 13+ level 2 syllabus with the omission of:

Forming linear equations

All work with coordinates

Compound units

Simple constructions

Angles in regular polygons beyond quadrilaterals

Transformations

Probability

Scatter diagrams

For those following a UK Key Stage 3 curriculum there is a little more variation but if e.g. the Pearson/Edexcel Year 7 syllabus has been followed then only the ideas of symmetry may need a little more work.

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

This document provides official guidance for candidates preparing for the **Tonbridge School Year 7 Entrance Paper in Mathematics**, designed for pupils applying for **11+ entry**. Published by Tonbridge School itself, this is not a practice paper but a comprehensive syllabus overview explaining what topics will be examined and how the paper is structured.

The guidance makes clear that the paper is **non-calculator**, lasts **60 minutes**, and carries **100 marks**. Around **75% of questions** test routine techniques, while the remaining **25%** present more sophisticated or multi-stage problems requiring deeper reasoning. Topics span number operations with fractions and decimals, simple algebra including solving linear equations, geometry (areas, perimeters, volumes, angle properties), and data handling through statistical charts and averages.

This guidance is invaluable for pupils from diverse mathematical backgrounds, as Tonbridge explicitly states that no specific syllabus is assumed. The document also maps the content to both the Common Entrance Level 2 syllabus and the UK Key Stage 3 curriculum, helping teachers and parents identify any gaps that may need revision before the examination.

How this paper is organised

The actual entrance paper is **60 minutes long** and worth **100 marks**, designed to be completed without a calculator. Candidates will need only basic stationery: a pen, pencil, ruler, and rubber. Protractors and compasses are not required, indicating that geometric construction and direct angle measurement will not be tested.

The paper is structured around **four main topic areas**: Number (covering arithmetic with whole numbers, fractions, decimals, percentages, indices, roots, sequences, ratio, and proportion), Algebra (substitution, simplification, factorising, and solving but not forming linear equations), Geometry (areas, perimeters, volumes of cuboids, angle properties in polygons, symmetry, and classification of shapes), and Processing Data (averages, range, frequency tables, bar charts, pictograms, and pie chart interpretation with angles given).

The distribution is roughly **three-quarters routine technique questions** and **one-quarter stretching problems**. The latter may involve more sophisticated reasoning,

multi-step solutions, or less obvious methods, challenging pupils to apply learned techniques in unfamiliar contexts rather than simply reproduce memorised procedures.

Topics covered

- Four operations (addition, subtraction, multiplication, division) with whole numbers, fractions, and decimals, tested through both straightforward calculations and applied problem-solving
- Simple percentages, including finding a percentage of a quantity and applying percentage concepts to practical contexts such as discounts or increases
- Positive indices, square roots, and cube roots, with recognition and evaluation of powers and roots without calculator support
- Number sequences (excluding n th term formulae), requiring pupils to identify patterns, continue sequences, and find missing terms
- Ratio and proportional reasoning, including simplifying ratios, sharing quantities in given ratios, and solving proportion problems
- Algebraic expressions: substitution of numerical values, simplification by collecting like terms, and simple factorising of expressions
- Solving linear equations (but not forming them from worded problems), requiring manipulation and balancing to find unknown values
- Areas and perimeters of individual shapes (rectangles, triangles, circles) and compound shapes formed by combining these, including problems requiring decomposition
- Volumes of cuboids, tested through direct calculation and reverse problems where dimensions must be found
- Angle properties including angles on parallel lines (alternate, corresponding, co-interior angles) and angle sums of triangles and quadrilaterals
- Symmetry (line and rotational) and classification of triangles (equilateral, isosceles, scalene, right-angled) and quadrilaterals (square, rectangle, parallelogram, rhombus, trapezium, kite)
- Recognition and naming of pentagons and hexagons, demonstrating knowledge of polygon vocabulary
- Averages (mean, median, mode) and range of data sets, including calculation from lists and interpretation from frequency tables
- Statistical charts: constructing and interpreting frequency tables, bar charts, pictograms, and interpreting pie charts when sector angles are provided

How to use this paper for revision

- Practise **mental arithmetic with fractions and decimals** daily, as calculator use is forbidden and quick, accurate computation will save valuable time under exam conditions.
- Review **angle facts for parallel lines and polygons** thoroughly, ensuring you can identify alternate, corresponding, and co-interior angles confidently and know that triangles sum to 180° and quadrilaterals to 360° .
- Work through **multi-step word problems** involving ratio and proportion, breaking them down into smaller stages and checking intermediate answers to avoid compounding errors.
- Familiarise yourself with **algebraic notation and conventions**, including how to substitute negative numbers and decimals into expressions, and how to factorise simple expressions by identifying common factors.
- Revise **properties of all quadrilaterals** (square, rectangle, parallelogram, rhombus, trapezium, kite), focusing on symmetry, parallel sides, and equal angles to answer classification questions accurately.
- Practise **compound shape problems** by sketching diagrams, dividing shapes into rectangles and triangles, and labelling dimensions clearly before calculating areas or perimeters.
- Ensure you can **interpret pie charts** by converting given angles into fractions or percentages of the whole, as questions may require you to calculate frequencies from sector angles without measuring tools.

Common mistakes to avoid

- Confusing the **order of operations** in multi-step calculations, particularly when mixing addition, subtraction, multiplication, and division with fractions or decimals, leading to incorrect final answers.
- Misidentifying **angle types on parallel lines**, especially confusing alternate and corresponding angles or forgetting that co-interior angles sum to 180° rather than being equal.
- Failing to **simplify ratios fully** or making errors when sharing quantities in a given ratio by not finding the total number of parts before dividing the amount.
- Forgetting to apply the **correct formula for compound shapes**, such as adding areas when shapes are joined or subtracting when a shape is cut out, or miscalculating because of unlabelled or assumed dimensions.
- Substituting into **algebraic expressions incorrectly**, particularly when the value is negative or a fraction, and not applying brackets or the correct sign throughout the calculation.
- Mixing up **mean, median, and mode**, or calculating the mean but forgetting to divide by the number of values, especially when working with frequency tables where values repeat.

Exam technique

Begin by reading through the entire paper quickly to identify which questions appear most straightforward, and tackle those first to build confidence and secure easy marks. Allocate roughly **one minute per mark**, leaving five to ten minutes at the end to check answers and attempt any skipped questions.

For **multi-stage problems**, write down intermediate steps and partial answers clearly. Even if you cannot complete the problem, you may earn method marks, and showing your working allows you to spot errors when checking. If a question seems unclear, re-read it carefully and underline key numbers and operations required.

Manage your time strictly, especially on the **25% of stretching questions**. If a problem is taking more than three or four minutes without progress, move on and return to it later. Prioritise accuracy over speed on calculation-heavy questions, as careless arithmetic errors will cost marks even when your method is sound. Finally, always include units in your final answers where appropriate, and ensure fractions are in simplest form.

What to revise alongside this paper

To prepare fully, ensure you have mastered **mental multiplication tables up to 12×12** and can recall **squares up to 15^2 and cubes up to 5^3** , as these underpin many calculations in number, algebra, and geometry. Pupils who have only lightly covered ratio and proportion should work through additional problems involving sharing in ratios and scaling quantities, as these topics often challenge students from varied curricula.

If you are following the UK Key Stage 3 curriculum, pay particular attention to **symmetry of 2D shapes**, identifying lines of symmetry and orders of rotational symmetry for common polygons. Pupils preparing from a Common Entrance background should note that coordinates, transformations, and probability are **not examined**, so time is better spent consolidating the listed topics.

Once comfortable with the core content, progress to solving **algebraic problems with brackets and negative terms**, and practise finding angles in more complex diagrams involving multiple parallel lines or overlapping triangles. This will build the reasoning skills needed for the paper's more stretching 25% of questions.

Key terms

Indices, Square root, Cube root, Ratio, Proportion, Substitution, Factorising, Linear equation, Compound shape, Cuboid, Parallel lines, Alternate angles, Corresponding angles, Co-interior angles, Symmetry, Quadrilateral, Pentagon, Hexagon, Mean, Median, Mode, Range, Frequency table, Pictogram, Pie chart

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TONBRIDGE SCHOOL

Year 7 Entrance Examination SPECIMEN

Mathematics

Time allowed: 1 hour

Total Marks 100.

Name: _____

Current School: _____

Calculators may not be used.

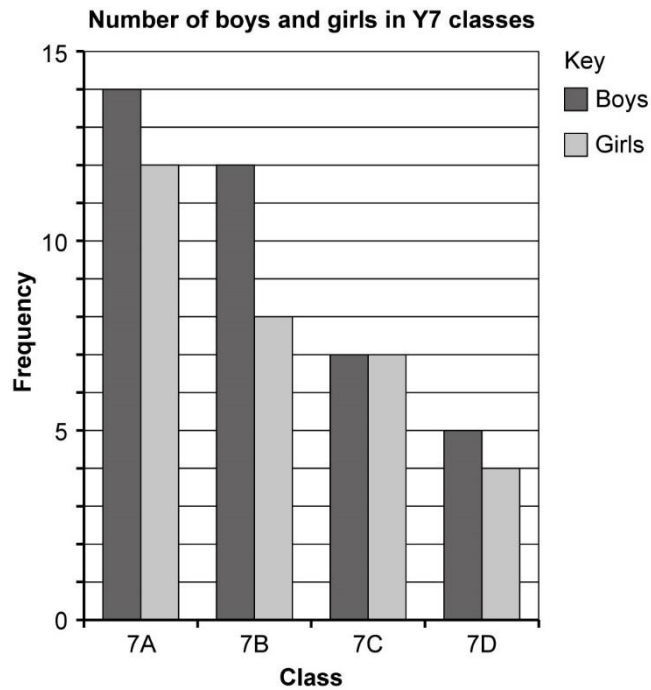
Write all your answers on this paper.

Answer as many questions as you can.

You should give working to show how you got your answer.

Do not worry if you think you have not covered one topic, just go on to the next question.

1. The bar chart shows the number of pupils in the four year 7 classes at a certain school.



a) How many girls in class 7D?

Answer: _____ (1)

b) How many boys in total in all four classes?

Answer: _____ (2)

c) What is the ratio of boys to girls in class 7B? Give your answer in its simplest form.

Answer: _____:_____ (2)

2. Four friends are shopping in their local supermarket.

- a) Anton buys a chocolate bar for £0.84 and a can of drink for £0.78. How much do they cost in total?

Answer: £ _____ (2)

- b) Boris buys a tube of suncream that costs £8.62. How much change does he receive from a £10 note?

Answer: £ _____ (2)

- c) Bottles of vintage lemonade cost £1.37. Charles buys 5 of these. What is the total cost?

Answer: £ _____ (2)

- d) Danny buys six doughnuts which cost a total of £2.76. How much does each doughnut cost?

Answer: _____ p (2)

3. Calculate

a) $4 + 5 \times 3 - 2$

Answer: _____(2)

b) 3×2^2

Answer: _____(1)

4. From the list of numbers: 5, 6, 8, 23, 27, 45, 72
(You may use each number more than once or not at all)

a) A factor of 12

Answer: _____(1)

b) A multiple of 15

Answer: _____(1)

c) A prime number bigger than 10

Answer: _____(1)

5.
a) Write 0.2 as a fraction in its lowest terms.

Answer: _____(2)

- b) Write these numbers in order from the smallest to the largest:

$$0.3, \quad \frac{8}{25}, \quad 33\%, \quad \frac{1}{3}$$

Answer: _____, _____, _____, _____(3)

6. A packet of sweets contains 15 red, 25 blue and 10 green. A larger packet of sweets has the colours in the same ratio and contains 22 green. How many blue are there in the larger packet.

Answer: _____(3)

7. The number of goals scored by a Tonbridge hockey team in their four matches last season were: 4, 6, 1, 6
- a) Find the mean number of goals scored.

Answer: _____(3)

- b) Find the median number of goals scored.

Answer: _____(2)

- c) What is the range of the number of goals scored?

Answer: _____(1)

8. If $a = 3$, $b = 5$ and $c = -2$, find the value of;

a) ab^2

Answer: _____(2)

b) $(bc)^2$

Answer: _____(2)

c) $\frac{a+b}{c}$

Answer: _____(2)

d) $\frac{2b-c}{a}$

Answer: _____(2)

e) $a - \frac{b}{c}$

Answer: _____(2)

9. Calculate, giving your answers as fractions or mixed numbers;

a) $\frac{1}{4} + \frac{1}{3}$

Answer: _____(2)

b) $3\frac{1}{4} - 1\frac{2}{5}$

Answer: _____(3)

c) $2\frac{1}{2} \times 1\frac{3}{5}$

Answer: _____(3)

d) $\frac{4}{5} \div \frac{3}{10}$

Answer: _____(2)

10. Simplify

a) $7a - 4a + 2a - a$

Answer: _____(2)

b) $3b \times b^2$

Answer: _____(1)

c) $\frac{4c^2}{8}$

Answer: _____(1)

d) $\frac{3d+3d}{4}$

Answer: _____(2)

e) $3 - 2(e - 1)$

Answer: _____(3)

11. Write down the next two terms of the following sequences;

a) 2, 4, 7, 11,

Answer: _____, _____(2)

b) $\frac{2}{3}$, 2, 6, 18,

Answer: _____, _____(2)

A sequence follows the rule:

Treble and add one

c) Explain why if the first term is $-\frac{2}{9}$ the second term is $\frac{1}{3}$

(2)

d) Find the fourth term

Answer: _____(2)

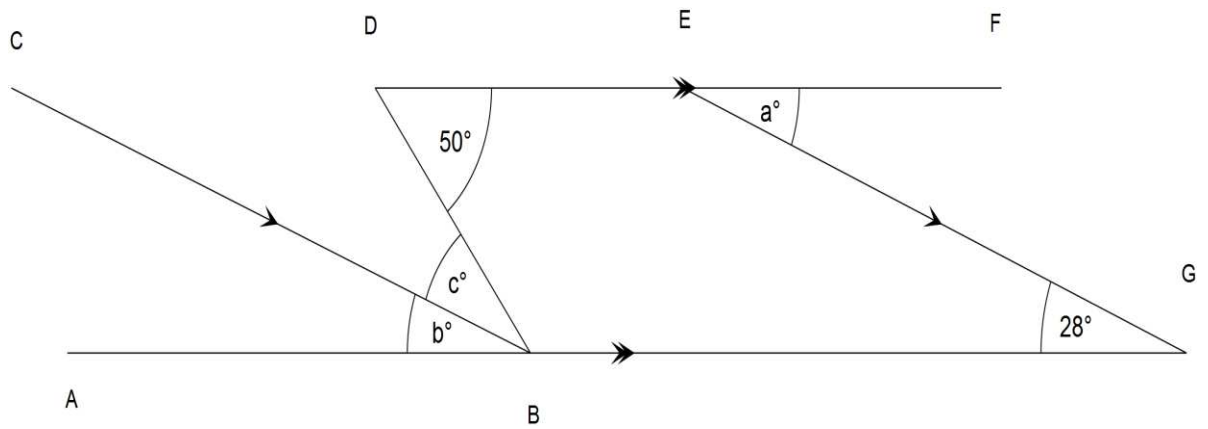
12. A tennis racket costs £85 originally. In a sale it is reduced by 15%. What is the sale price?

Answer: £ _____ (2)

I score 42 out of 48 on a test. What percentage is that?

Answer: _____ % (2)

13. In the diagram below the straight lines ABG and DEF are parallel. Lines CB and EG are also parallel. Find the angles marked a , b , c in the diagram.
The diagram is not drawn accurately.



Answer: $a =$ _____ (2)

$b =$ _____ (2)

$c =$ _____ (1)

14. Solve the equations (showing clear working);

a) $3x - 4 = 20$

$x = \text{_____}(2)$

b) $2 - x = 3(1 - x)$

$x = \text{_____}(3)$

c) $\frac{x}{3} = \frac{x-4}{2}$

$x = \text{_____}(3)$

15. Draw;

a) A quadrilateral with no line of symmetry but order two rotational symmetry,

(2)

b) A trapezium with a line of symmetry,

(2)

c) A rhombus with the two diagonals having lengths 6cm and 4cm.

(2)

16. Using some or all of the digits 1,3,5,7,0 make;
(each digit may only occur once so the three digit number 113 is not allowed but 507 is)

a) A three digit even number

Answer: _____(1)

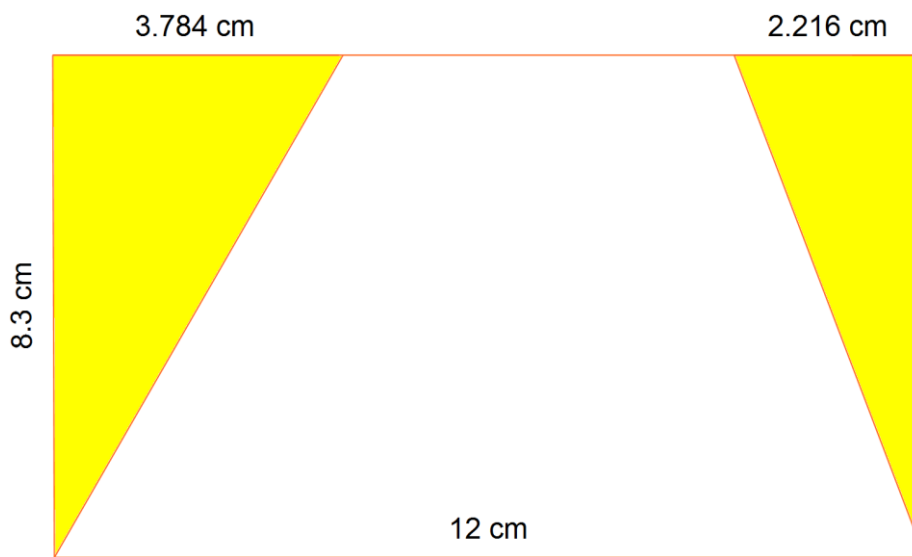
b) The smallest three digit multiple of 5

Answer: _____(1)

c) The largest possible multiple of 3 (this does not have to be a three digit number and may have more digits).

Answer: _____(2)

17. Find the total area of the shaded regions. *The diagram is not drawn accurately.*



Answer: _____ cm² (3)

End of questions

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

This is a **specimen Year 7 entrance examination** for **Tonbridge School**, designed to give prospective pupils a realistic preview of the **11+ Maths** assessment they will face when applying for entry. The paper carries **100 marks** and is intended to be completed in **one hour** without a calculator, reflecting the school's expectation that candidates can work confidently with mental arithmetic and written methods.

The examination spans a wide range of mathematical topics, from data handling and arithmetic with money to algebra, geometry, and problem solving. Questions are presented in a mix of styles: short numerical answers, ratio and proportion tasks, algebraic manipulation, and geometric reasoning. The paper is structured to test both procedural fluency (such as simplifying expressions or solving equations) and conceptual understanding (such as recognising properties of shapes or interpreting bar charts).

This specimen paper is particularly useful for **Year 6 pupils** preparing for selective independent school entry, as well as tutors and parents seeking to gauge readiness for Tonbridge's entrance process. Its breadth and level of challenge provide a valuable benchmark for revision planning and identifying areas that need further practice before the actual exam.

How this paper is organised

The paper comprises **17 multi-part questions** totalling **100 marks**, with individual questions worth between 1 and 3 marks each. The layout is clean and spacious, with answer lines provided directly on the question paper. Candidates are instructed to show all working, and the paper emphasises that it is acceptable to skip topics not yet covered in a student's current school, moving on to the next question without penalty.

Questions are ordered roughly by topic rather than difficulty, beginning with data interpretation (bar charts), moving through money arithmetic, order of operations, factors and multiples, fractions and decimals, ratio, statistics, substitution into algebraic expressions, fraction arithmetic, algebraic simplification, sequences, percentages, angle properties, equation solving, symmetry and shape construction, digit puzzles, and culminating in an area problem involving composite shapes. Each part is clearly labelled with its mark value in brackets.

The one-hour time limit suggests candidates should aim to spend an average of three to four minutes per mark, though some questions (such as drawing tasks or multi-step word problems) will naturally take longer. The balance between short procedural questions and longer problem-solving items makes pacing an important skill to practise.

Topics covered

- Reading and interpreting **bar charts** with grouped data (boys and girls in different classes)
- Arithmetic with **decimals and money**: addition, subtraction, multiplication, and division in context (shopping scenarios)
- Order of operations (**BIDMAS**) and working with **powers** (squares and indices)
- Factors, multiples, and **prime numbers** selected from a given list
- Converting decimals to fractions in **lowest terms** and ordering fractions, decimals, and percentages
- Ratio problems involving **scaling** and maintaining proportional relationships
- Calculating **mean, median, and range** from a small data set
- Substituting positive and negative integers into **algebraic expressions**, including brackets and division
- Addition, subtraction, multiplication, and division of **fractions and mixed numbers**
- Simplifying algebraic expressions: collecting like terms, multiplying terms, dividing terms, and expanding **brackets**
- **Sequences**: recognising patterns, extending arithmetic and geometric sequences, and applying a rule involving fractions
- Percentage decrease and calculating a percentage from a fraction
- **Angle properties** with parallel lines: alternate angles, corresponding angles, co-interior angles, and angles in a triangle
- Solving **linear equations** with brackets and fractional expressions
- Properties of **quadrilaterals**: drawing shapes with specified symmetry (rotational and reflective) and constructing a rhombus from diagonal lengths
- Digit puzzles: forming numbers with constraints (even/odd, multiples, divisibility rules)
- Calculating the **area of composite shapes** by breaking a trapezium into triangles and rectangles

How to use this paper for revision

- Practise **mental arithmetic with decimals** (especially money problems) by working through shopping scenarios without a calculator, building both speed and accuracy.
- Revise **BIDMAS rules** thoroughly, writing out each step when working through order-of-operations questions to avoid missing the multiplication or division stages.
- Memorise the first ten **prime numbers** and be confident recognising factors and multiples of common numbers up to 100.
- Convert between fractions, decimals, and percentages fluently. Create a reference card with key conversions (e.g. $1/3 = 0.333\dots$, $1/4 = 0.25 = 25\%$) and practise ordering mixed sets.
- For **ratio and proportion** problems, always identify the scale factor explicitly before calculating the unknown quantity.
- When substituting into algebraic expressions, write out each step separately and take care with **negative numbers**, especially when squaring or dividing.
- Draw quick sketches for **geometry questions** (angles, symmetry, area). Label known angles and use angle properties systematically rather than guessing.
- Practise solving equations by performing the same operation on both sides and **showing every line of working** clearly, as marks are awarded for method even if the final answer is incorrect.

Common mistakes to avoid

- Applying BIDMAS incorrectly, especially forgetting to do **multiplication and division before addition and subtraction** (e.g. writing $4 + 5 \times 3 - 2 = 25$ instead of 17).
- Confusing factors and multiples: a factor divides exactly into a number, while a multiple is produced by multiplying. Students often list multiples when asked for factors.
- Ordering fractions, decimals, and percentages without converting to a common form, leading to errors (e.g. assuming $0.3 > 1/3$ without checking).
- In ratio problems, **scaling only one part of the ratio** or forgetting to multiply both parts by the same scale factor.
- When substituting into expressions like $a - b/c$, forgetting that **division takes precedence** unless brackets are explicitly shown, leading to incorrect answers.
- Not simplifying fractions fully or giving mixed numbers when an improper fraction is equally acceptable (or vice versa), risking losing marks for the form of the answer.
- In angle problems with parallel lines, confusing **alternate and corresponding angles**, or failing to spot that angles on a straight line sum to 180° .
- Rushing equation-solving steps and **losing track of negative signs**, particularly when expanding brackets or rearranging terms across the equals sign.

Exam technique

Start by reading through the entire paper quickly to identify questions you can answer confidently. Tackle these first to bank marks early and build momentum. If a question seems unfamiliar or particularly challenging, move on and return to it later rather than losing valuable time. The instruction to skip topics not yet covered is there for a reason: the examiners expect some candidates to be less familiar with certain areas.

Show all working clearly, even for questions that seem straightforward. **Method marks** are often awarded even when the final answer is incorrect, and clear working makes it easier to spot and correct errors if you have time to check. Use the answer lines provided, but if you need more space, continue neatly in the margin or on a blank page and indicate where the examiner should look. Write legibly, circle or underline final answers, and include units where required (e.g. £, cm^2 , p).

Pace yourself by aiming to spend roughly **three to four minutes per mark**. This means a 3-mark question might take ten minutes, while a 1-mark question should take no more than three or four. Leave a couple of minutes at the end to review your answers: check for missing units, arithmetic slips, and questions you may have skipped. If you finish

early, resist the temptation to sit back; use the time to verify calculations and revisit any questions you flagged as uncertain.

What to revise alongside this paper

To prepare thoroughly for this paper, revise **basic arithmetic** with whole numbers, decimals, and fractions, ensuring fluency without a calculator. Strengthen understanding of **algebra** by practising simplification, factorising, and solving linear equations with one unknown. Work through problems involving **sequences and patterns**, including both arithmetic and geometric progressions, and be confident recognising the rule from a few terms.

Geometry revision should cover properties of **quadrilaterals** (parallelograms, trapeziums, rhombuses, rectangles, squares), angle rules with parallel lines and transversals, and calculating areas of triangles, rectangles, and composite shapes. Practise drawing shapes to specification and identifying lines of symmetry or orders of rotational symmetry. Questions on **data handling** (bar charts, pie charts, averages) appear regularly, so ensure you can extract information accurately from graphs and calculate mean, median, mode, and range.

For students aiming to excel, explore **harder ratio and proportion** problems (such as recipes or map scales) and tackle more complex algebraic manipulation, including equations with fractions on both sides or expressions requiring careful expansion of brackets. Familiarity with **percentage increase and decrease** in real-world contexts (discounts, interest, VAT) will also serve you well.

Key terms

BIDMAS, Factor, Multiple, Prime number, Ratio, Mean, Median, Range, Substitution, Algebraic expression, Simplify, Lowest terms, Parallel lines, Alternate angles, Corresponding angles, Trapezium, Rhombus, Order of rotational symmetry, Composite shape, Scale factor

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