

11+ PRACTICE PACK

Exam Ninja Test 4

11+ Maths Complete Practice Pack

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PRACTISE THE REAL THING

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1 A taxi company charges a fare of F pence for a journey lasting d kilometres, where $F = 300 + 20d$.

Sarah travels 12 kilometres in a taxi.

How much does her journey cost, in pounds?

A £5.40

B £3.00

C £54.00

D £30.00

1

2 Amelia is baking a cake for her friend's birthday party. The recipe requires her to take the number of eggs needed, multiply it by 2, then add 4 and finally divide the result by 3.

Which of the following expressions shows the result, where e represents the number of eggs?

A $((e \times 2) + 4) \div 3$

B $(e \times 2 + 4) \div 3$

C $e \times (2 + 4) \div 3$

D $e \times 2 + (4 \div 3)$

1

3 Amir has a collection of 15 model cars.

Each model car is 12.3 cm long.

If Amir lines up all his model cars bumper to bumper, what is the total length of the line?

A 184.5 cm

B 147.6 cm

C 172.2 cm

D 196.8 cm

1

4 Amelia is making a cake for her friend's birthday party.

The recipe requires 1.25 kg of flour.

How much is this in grams?

A 1250 g

B 125 g

C 12500 g

D 12.5 g

1

5 Liam is planning a charity bike ride to raise money for a local animal shelter.

He estimates that it will take him 15 minutes to cycle to the starting point, then 2 minutes for every kilometre he cycles during the event, and an additional 10 minutes to cycle back home after completing the ride.

Which of the following expressions could Liam use to calculate the total time for the charity bike ride, in minutes, if he cycles k kilometres during the event?

A $25 + 2k$

B $25k$

C $15k + 10$

D $15 + 10k$

1

6

A rectangular garden has a perimeter of 60 metres.

The length and width are both whole numbers of metres. The length is under 16 metres.

Which of the following could not be the width of the garden?

A 14**B** 16**C** 17**D** 18

1

7

A bakery produces 576 cupcakes per day. If they work for 18 days, how many cupcakes will they produce in total?

Following on from this, which of the following calculations is correct?

A $10\,944 \div 18 = (576)18$ **B** $10\,948 = 18 \times 576 + 576$ **C** $18 \times 576 + 576 = 10\,368$ **D** $576 \times 16 + 576 = 10\,368$

1

8

In a science experiment, a solution is created by mixing 0.045 litres of chemical A with a certain volume of water.

If the total volume of the solution is 4.5 litres, how much water was added?

A 0.45 litres**B** 4.455 litres**C** 45 litres**D** 4.55 litres

1

9

Amir is planning a road trip and wants to make sure he has enough fuel.

His car consumes 6.2 litres of petrol per 100 km.

What is the minimum number of whole litres of petrol he should buy to cover a distance of 450 km?

A 27.9**B** 28**C** 29**D** 30

1

10

A taxi company uses the formula $F = 3 + 1.5d$ to calculate the fare in pounds, F , for a journey, where d is the distance travelled in kilometres.

How much would a passenger pay for a 12 kilometre journey?

A £21**B** £15**C** £18**D** £24

1



Paper Notes: 11+ Maths Question Booklet (Test 4)

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

Overview

This is **11+ Maths Test 4** from **Exam Ninja**, a practice paper designed for students preparing for **11+ entrance examinations** in the **GL Assessment** style. The paper targets pupils aged 10 to 11 who are working towards Year 7 entry at selective secondary schools.

The test contains **10 multiple-choice questions** that assess a broad range of mathematical skills, including algebraic manipulation, word problems involving real-world contexts, measurement conversions, and geometric reasoning. Each question offers four possible answers and is worth **1 mark**, making the total score out of 10. The contexts are varied and engaging, featuring scenarios such as taxi fares, baking recipes, model car collections, charity bike rides, and fuel consumption.

This paper is particularly useful for building confidence with formula-based questions and for practising the careful reading of multi-step word problems. The multiple-choice format rewards accuracy and allows students to eliminate incorrect answers systematically. It serves as a focused diagnostic tool to identify gaps in topics such as unit conversion, algebraic expression writing, and perimeter problems.

How this paper is organised

The paper comprises **10 questions** spread across **two pages**, with each question allocated **1 mark**. Every question is presented in a multiple-choice format with four options labelled A, B, C, and D. The layout is clean and uncluttered, with generous white space around each question to support clarity and reduce cognitive load.

Questions are numbered sequentially from 1 to 10 and cover a mixture of algebraic reasoning, arithmetic operations with decimals, measurement conversions, and geometric properties. The paper does not specify a time limit on the document itself, though 11+ maths papers of this length are typically completed within 20 to 25 minutes under timed conditions.

Each question is self-contained, with all necessary information provided in the stem. Several questions involve named characters (Amelia, Amir, Liam, Sarah) in relatable contexts, a common feature of modern 11+ papers designed to make abstract concepts more accessible and to test reading comprehension alongside numerical reasoning.

Topics covered

- Substitution into linear algebraic formulas, including converting units from pence to pounds (question 1, 10)
- Writing and interpreting algebraic expressions to model multi-step procedures, with attention to order of operations and bracketing conventions (question 2, 5)
- Multiplication of decimals in real-world contexts, such as calculating total length from repeated measurements (question 3)
- Conversion between metric units, specifically kilograms to grams and litres to smaller subunits (question 4, 8)
- Perimeter of rectangles with constraints, testing understanding of whole number dimensions and inverse operations (question 6)
- Multi-step arithmetic: multiplying large numbers, checking calculations, and evaluating equivalent expressions (question 7)
- Decimal subtraction in practical contexts, such as finding the difference between total volume and a component volume (question 8)
- Proportional reasoning and rounding up to ensure sufficiency, applied to fuel consumption rates (question 9)
- Problem-solving with constraints, including checking which values satisfy given conditions (question 6)

How to use this paper for revision

- Practise substituting numbers into formulas carefully, writing out each step on rough paper to avoid errors with negative signs or order of operations.
- When converting units, memorise the key metric conversions (1 kg = 1000 g, 1 litre = 1000 ml) and always double-check which direction you are converting.
- For questions involving expressions, translate each instruction in the word problem into a mathematical operation one at a time, using brackets to keep the order clear.
- If a question asks for a minimum or maximum value, remember to round appropriately: round up if you need to ensure sufficiency (like fuel), round down if you cannot exceed a limit.
- In perimeter problems, use the formula $P = 2(l + w)$ and rearrange to find missing dimensions; check each answer option against any stated constraints.
- Read multi-choice options carefully before calculating; sometimes you can eliminate obviously incorrect answers (e.g. those that use the wrong units or order of magnitude) to save time.

Common mistakes to avoid

- Forgetting to convert pence to pounds (dividing by 100) after substituting into a formula, leading to answers that are 100 times too large.
- Writing algebraic expressions without proper brackets, so that order of operations is incorrect (e.g. writing $e \times 2 + 4 \div 3$ instead of $((e \times 2) + 4) \div 3$).
- Multiplying decimals incorrectly, especially forgetting to count the total number of decimal places in the factors when placing the decimal point in the product.
- Confusing which conversion factor to use, such as multiplying by 1000 when you should divide, or vice versa.
- In perimeter questions, testing only one answer option or failing to check that both dimensions satisfy all given constraints (e.g. length under 16 m, both whole numbers).
- Rounding down instead of up when a question asks for the minimum quantity needed to cover a requirement, resulting in an answer that is insufficient.

Exam technique

Approach this paper by reading each question twice: once to understand the context and once to identify the mathematical operation required. Because every question is worth 1 mark, do not spend more than two minutes on any single item during a timed attempt. If you are uncertain, eliminate answers that are clearly wrong (wrong units, wrong order of magnitude, or values that violate stated constraints) and make an educated guess from the remaining options.

Work through the paper in order, but if you encounter a question that stumped you, mark it lightly and return to it at the end. Multiple-choice questions reward partial knowledge, so use estimation and common sense to narrow down choices. For formula-based questions, always write out your substitution and simplification steps on rough paper to catch arithmetic slips before you commit to an answer.

After completing the paper, spend a few minutes checking your answers, focusing especially on unit conversions and any question where you had to round. Compare your chosen answer against the question stem to ensure it makes sense in context. If working independently, mark your own responses using a reliable mark scheme and note any topics where you lost marks, then revise those areas using a textbook or online resources before attempting a similar paper.

What to revise alongside this paper

Students should consolidate their understanding of **metric unit conversions** across mass, length, and volume, as these appear frequently in 11+ papers. Practise converting between grams and kilograms, millilitres and litres, and centimetres and metres, both by multiplying and dividing by powers of 10. Reinforce your grasp of **order of operations** and the correct use of brackets in algebraic expressions, as these are tested explicitly in questions 2 and 5.

Work on **problem-solving with constraints**, particularly questions that ask which value cannot satisfy a set of conditions (as in question 6). This requires systematic testing of each option and clear logical reasoning. Extend your revision to include **ratio and proportion**, which underpin questions about rates (e.g. fuel consumption per 100 km) and are central to the 11+ curriculum.

For stretch and challenge, explore more complex algebraic manipulation, including solving equations and rearranging formulas, and practise multi-step word problems that require you to interpret information, select the correct operation, and check the reasonableness of your answer. These skills will prepare you for the full range of 11+ maths question types.

Key terms

Substitution, Algebraic expression, Order of operations (BIDMAS/BODMAS), Linear formula, Metric conversion, Decimal multiplication, Perimeter, Constraints, Proportional reasoning, Rounding up, Multiple-choice elimination, Rate (per unit), Whole numbers, Unit cost

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11+ Practice Test Answers

11+ Maths Test 4

Question	Answer	Explanation	Marks
1	£5.40	<p>The taxi fare formula is given as $F = 300 + 20d$, where F is the fare in pence and d is the distance travelled in kilometres.</p> <p>Sarah's journey is 12 kilometres, so we substitute $d = 12$ into the formula:</p> $F = 300 + 20 \times 12$ $F = 300 + 240$ $F = 540 \text{ pence}$ <p>To convert pence to pounds, we divide by 100:</p> $540 \div 100 = \text{£}5.40$ <p>Therefore, Sarah's taxi journey costs £5.40.</p>	1
2	$((e \times 2) + 4) \div 3$	<p>To find the correct expression, we need to follow the order of operations given in the question:</p> <ol style="list-style-type: none">1. Multiply the number of eggs (e) by 2: $e \times 2$2. Add 4 to the result: $(e \times 2) + 4$3. Divide the result by 3: $((e \times 2) + 4) \div 3$ <p>Therefore, the correct expression is $((e \times 2) + 4) \div 3$.</p>	1
3	184.5 cm	<p>To find the total length of the line of model cars, we need to multiply the number of cars by the length of each car.</p> <p>Number of model cars: 15 Length of each model car: 12.3 cm</p> $\text{Total length} = 15 \times 12.3 \text{ cm} = 184.5 \text{ cm}$ <p>Therefore, the total length of the line of model cars is 184.5 cm.</p>	1
4	1250 g	<p>To convert kilograms to grams, we need to multiply the number of kilograms by 1000.</p> $1 \text{ kg} = 1000 \text{ g}$ $1.25 \text{ kg} = 1.25 \times 1000 \text{ g} = 1250 \text{ g}$ <p>Therefore, 1.25 kg of flour is equal to 1250 grams.</p>	1

5	$25 + 2k$	<p>To calculate the total time for Liam's charity bike ride, we need to add the time taken for each part of the journey:</p> <ol style="list-style-type: none"> 1. Cycling to the starting point: 15 minutes 2. Cycling during the event: 2 minutes for every kilometre cycled ($2k$ minutes, where k is the number of kilometres) 3. Cycling back home after the ride: 10 minutes <p>Therefore, the total time can be expressed as:</p> <p>Total time = Time to starting point + Time during event + Time back home</p> <p>Total time = $15 + 2k + 10$</p> <p>Simplifying the expression, we get:</p> <p>Total time = $25 + 2k$</p> <p>So, the correct answer is '$25 + 2k$'.</p>	1
6	16	<p>Let the width of the rectangle be w metres and the length be l metres.</p> <p>We know that the perimeter of a rectangle is given by the formula: $2(l + w) = 60$</p> <p>Since the length and width are whole numbers, we can find the possible values of w by substituting values for l.</p> <p>If $l = 15$, then $2(15 + w) = 60 \Rightarrow 30 + 2w = 60 \Rightarrow 2w = 30 \Rightarrow w = 15$</p> <p>If $l = 14$, then $2(14 + w) = 60 \Rightarrow 28 + 2w = 60 \Rightarrow 2w = 32 \Rightarrow w = 16$</p> <p>If $l = 13$, then $2(13 + w) = 60 \Rightarrow 26 + 2w = 60 \Rightarrow 2w = 34 \Rightarrow w = 17$</p> <p>If $l = 12$, then $2(12 + w) = 60 \Rightarrow 24 + 2w = 60 \Rightarrow 2w = 36 \Rightarrow w = 18$</p> <p>Therefore, the possible whole number values for the width are 15, 16, 17, and 18. The value 14 is not a possible width.</p>	1
7	$18 \times 576 + 576 = 10\ 368$	<p>To find the total number of cupcakes produced in 18 days, we need to multiply the daily production by the number of days:</p> <p>$576 \times 18 = 10\ 368$ cupcakes</p> <p>Now, let's check each calculation:</p> <ol style="list-style-type: none"> 1. $10\ 944 \div 18 = 608$; $576 \times 18 = 10\ 368$ (Incorrect) 2. $18 \times 576 + 576 = 10\ 944$ (Incorrect); 3. $18 \times 576 + 576 = 10\ 944$ (Correct) 4. $576 \times 16 + 576 = 9\ 792$ (Incorrect) <p>Therefore, only the third calculation ($18 \times 576 + 576 = 10\ 368$) is correct.</p>	1
8	4.455 litres	<p>To find the volume of water added, we need to subtract the volume of chemical A from the total volume of the solution.</p> <p>Volume of chemical A = 0.045 litres Total volume of the solution = 4.5 litres</p> <p>Volume of water = Total volume - Volume of chemical A Volume of water = $4.5 - 0.045$ Volume of water = 4.455 litres</p> <p>Therefore, 4.455 litres of water was added to create the solution.</p>	1

9	28	1
10	£21	1

To calculate the minimum number of litres of petrol Amir needs, we first need to find out how many litres his car consumes for the given distance.

Amir's car consumes 6.2 litres per 100 km. For 450 km, the calculation would be:

$$6.2 \text{ litres} \times (450 \text{ km} \div 100 \text{ km}) = 6.2 \text{ litres} \times 4.5 = 27.9 \text{ litres}$$

Since Amir can only buy whole litres of petrol, he should purchase at least 28 litres to ensure he has enough fuel for his 450 km road trip.

To find the cost of the journey, we need to substitute the distance travelled, d , into the formula:

$$F = 3 + 1.5d$$

Given: $d = 12$ kilometres

Substituting the value of d into the formula:

$$F = 3 + 1.5 \times 12$$

$$F = 3 + 18$$

$$F = \text{£}21$$

Therefore, the passenger would pay £21 for a 12 kilometre journey.

Answer-Key Notes: 11+ Maths Answers (Test 4)

Compiled by [SATs-Papers.co.uk](https://www.SATs-Papers.co.uk) to help you mark this paper and learn from each answer.

How to use this answer key

This answer key provides the correct answer and full working for each question. **Mark each question according to the mark allocation shown** (all questions carry 1 mark), awarding credit only when the final answer matches exactly. Because every explanation already includes step-by-step working, you can compare your child's method directly with the model solution.

If an answer is wrong, look at where the working diverges. A slip in arithmetic (writing $300 + 240 = 640$ instead of 540) is different from choosing the wrong operation or misunderstanding the formula. **Careless errors cluster around calculation; conceptual gaps show up in method.**

Use the worked examples below when a question was missed but the reason is not obvious from the mark scheme alone. They highlight the thinking that leads to the correct answer, especially where multiple steps or careful reading of the question is required.

Score interpretation

This paper contains 10 questions, each worth 1 mark, for a total of 10 marks. The questions progress in demand: early items (Q1–4) test formula substitution, unit conversion and straightforward calculation, while later questions (Q6–7, Q9) require multi-step reasoning, elimination of incorrect options or rounding judgement.

A score of 7–10 indicates confident handling of formulae, decimals and word problems at 11+ standard. Mistakes in this band are usually isolated slips rather than systematic gaps. A score of 4–6 suggests competence with basic operations but uncertainty when a question involves two or more steps, requires forming an algebraic expression or asks 'which could not'. Review the worked examples for those questions to see how to break the problem into parts.

Below 4 marks, fundamentals need attention: substituting into formulae, converting units, recognising what the question is asking. Revisit each topic (formulae, decimals, perimeter, percentages as decimals) separately before attempting a full mixed paper again.

Worked examples

Formula substitution and unit conversion, Q1, Q4, Q8, Q10

Marks are lost when students substitute correctly but forget the final conversion

(pence to pounds in Q1, for example) or mis-align decimal places (Q8). The formula itself is given; the challenge is careful arithmetic and checking that the answer is in the units requested. Always write down the substitution step explicitly—seeing $F = 300 + 20 \times 12$ on paper makes the order of operations clear and reduces errors.

Q1 : £5.40

Substitute $d = 12$ into $F = 300 + 20d$ to get $F = 300 + 240 = 540$ pence. **The question asks for the cost in pounds**, so divide 540 by 100 to obtain £5.40. Many candidates write 540 or £540 and lose the mark because they have not converted the units.

Q8 : 4.455 litres

Total volume is 4.5 litres; chemical A occupies 0.045 litres. **Subtract $4.5 - 0.045 = 4.455$ litres**. Align the decimal points carefully: $4.500 - 0.045$. A common error is $4.5 - 0.45 = 4.05$, caused by misreading 0.045 as 0.45.

Forming algebraic expressions, Q2, Q5

These questions describe a sequence of operations in words and ask for the matching expression. **Translate one instruction at a time and use brackets to preserve order**. Students often write the operations in the correct sequence but omit brackets, so that division or multiplication applies too early. Always check your expression by substituting a simple number (for example, $e = 2$) and following both the words and your algebra to confirm they give the same result.

Q2 : $((e \times 2) + 4) \div 3$

Step 1: multiply the number of eggs by 2 gives $e \times 2$. Step 2: add 4 gives $(e \times 2) + 4$. Step 3: divide the result by 3 gives $((e \times 2) + 4) \div 3$. **Without the outer brackets, the division would apply only to the 4**, which does not match the instruction 'divide the result'.

Q5 : $25 + 2k$

Add the three parts of the journey: 15 minutes to the start, $2k$ minutes during the event (2 minutes per kilometre for k kilometres) and 10 minutes returning. **$15 + 2k + 10$ simplifies to $25 + 2k$** . Option D, $15 + 10k$, would mean 10 minutes per kilometre, which contradicts the question.

Multi-step reasoning and elimination, Q6, Q7, Q9

Questions that ask 'which could *not*' or 'which calculation is correct' reward systematic checking. **Do not stop at the first option that looks plausible; test every option** or work out the answer independently and then match it. Q6 and Q9 both require rounding or constraint logic—write down every possibility before deciding which is ruled out.

Q6 : 14

Perimeter $2(l + w) = 60 \Rightarrow l + w = 30$. If $l = 14$, then $w = 16$; if $l = 15$, $w = 15$; if $l = 16$, $w = 14$.

The question states length is under 16 metres, so l cannot be 16, which means w cannot be 14. Widths 15, 16, 17, 18 correspond to lengths 15, 14, 13, 12, all valid.

Q9 : 28

Amir's car uses 6.2 litres per 100 km. For 450 km: $6.2 \times (450 \div 100) = 6.2 \times 4.5 = 27.9$ litres. **He can only buy whole litres, so round 27.9 up to 28.** Answer A (27.9) is not a whole number and would leave him short; 28 is the minimum valid purchase.

Next steps

Review every question your child answered incorrectly and identify whether the mistake was arithmetical or conceptual. If several errors involve decimals (Q3, Q8), spend a session on place-value and column subtraction with decimals. If the difficulty was forming expressions (Q2, Q5) or interpreting 'which could not' (Q6), practise translating word problems into maths statements and checking each option in turn. Use the worked examples in this key to model the thinking process aloud.

If the score was 7 or above, consolidate by attempting a similar mixed paper under timed conditions, then move on to papers that include fractions, percentages, ratio or geometry to broaden coverage. If the score was below 7, revisit individual topics (formulae, unit conversion, perimeter, rounding) using a focused workbook before returning to full practice papers. Small, targeted practice builds accuracy faster than repeating whole tests.

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