

11+ PAST PAPER PACK

The Manchester Grammar School 11+ Maths 2018

Complete Past Paper Pack

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Includes Paper Notes: score interpretation, selected worked examples, next steps.

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ARITHMETIC - SECTION A ANSWERS

1	902
---	-----

11	£ 5.04
----	--------

18	4
----	---

2	64
---	----

3	7.9
---	-----

12	5 cm
----	------

19	119
----	-----

4	$1 \frac{5}{8}$
---	-----------------

13	35
----	----

5	7050
---	------

6	260 g
---	-------

7	$\frac{17}{20}$
---	-----------------

14	43
----	----

8	219.41
---	--------

20	8
----	---

(For info the list is:
42 22 8 4 0)

15	£ 144
----	-------

9	58
---	----

16	100 cals
----	----------

10	8
----	---

17	60
----	----

Q1 - 10

Q1 - 10

Q11 - 20

Q11 - 20

Number Correct	
----------------	--

Number Wrong	
--------------	--

Number Correct	
----------------	--

Number Wrong	
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Answer-Key Notes: 11+ Maths Answers (11+ Maths Answers (2018))

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 answers for all twenty arithmetic questions. When marking your child's work, check each answer carefully against the list, paying particular attention to units (grams, centimetres, pounds, calories) and to how fractions and decimals are expressed. The tables at the bottom allow you to count correct and incorrect answers separately for Q1–10 and Q11–20, which helps you identify whether your child tires towards the end.

If an answer is wrong, ask your child to re-do the calculation on scrap paper before consulting the question paper's working. A misread digit or dropped decimal point signals a presentation issue; a fundamental method error signals a topic to revise. Use the worked examples below for questions that are commonly misjudged because of unit conversion, mixed-number handling or multi-step reasoning.

The note '(For info the list is: 42 22 8 4 0)' on Q20 refers to intermediate values or rankings that feed into the final answer of 8. If your child wrote one of those numbers instead, check that they completed every step the question required.

Score interpretation

A score of 18–20 is excellent and shows confident arithmetic fluency under timed conditions. Children scoring at this level should ensure they are equally comfortable with word problems and with the reasoning section (Section B) that typically follows arithmetic. A score of 14–17 is solid; errors are usually clustered around unit conversions (Q6, Q12, Q16), fractions (Q4, Q7) or longer decimals (Q8). Review those topics and check whether the mistakes were conceptual or simply rushed working.

A score of 10–13 suggests that some core topics need reinforcement: fractions, decimals, percentages, or the four operations with larger numbers. Prioritise little-and-often practice on the two or three question types that caused most trouble. Scores below 10 indicate that basic number confidence is not yet secure; slow down, use pencil-and-paper methods rather than mental calculation, and work through CGP or Bond arithmetic chapters systematically before attempting full papers again.

Use the Q1–10 versus Q11–20 tallies at the bottom of the page. If performance drops noticeably in the second half, stamina and time management—not knowledge—may be the real issue.

Worked examples

Large-number arithmetic and place value, Q1–2, Q5

These questions test whether children can apply column methods to numbers in the hundreds and thousands without losing track of place value. Marks are lost when zeros are mishandled (writing 92 instead of 902, or 705 instead of 7050) or when a digit slips one column left or right. Accurate setting-out is as important as correct calculation.

Q1 : 902

The question likely involved addition, subtraction or multiplication that produces a three-digit answer with a zero in the tens column. Many children write 92 by accident because they forget to hold the zero. Always write every digit, even when it is zero, and check your answer has the right number of digits.

Q5 : 7050

This answer has two zeros that must appear in the correct positions. A common error is 705 (forgetting the final zero) or 7500 (misreading the question or miscalculating). Check that your method accounts for every place value and that you have not rounded prematurely.

Fractions and mixed numbers, Q4, Q7

Questions that ask for answers as fractions or mixed numbers penalise children who leave improper fractions unreduced or who write a decimal when a fraction is required. Read the instruction line carefully: if the answer box shows a fraction bar, give your answer as a fraction. Simplify fully unless told otherwise.

Q4 : $1 \frac{5}{8}$

The question required an answer in mixed-number form. If you calculated $\frac{13}{8}$, you must convert it to 1 and $\frac{5}{8}$. Writing 1.625 would be incorrect here even though it is numerically equivalent, because the answer format is specified. Always convert improper fractions to mixed numbers unless the question says otherwise.

Q7 : $\frac{17}{20}$

This fraction is already in its simplest form because 17 is prime. A common mistake is to write 0.85 (the decimal equivalent) when a fraction is required, or to leave an answer such as $\frac{34}{40}$ without cancelling. Check the highest common factor of numerator and denominator.

Decimals and money, Q3, Q8, Q11, Q15

Decimal questions punish careless alignment of the decimal point and rounding errors. When the answer involves money, always write two decimal places (£5.04, not £5.4) and include the pound sign if the answer box shows it. Children who use mental methods for decimal multiplication or division often drop or misplace the point.

Q8 : 219.41

This answer has two decimal places and is likely the result of a multiplication or division involving money or measurements. A frequent error is 21.941 or 2194.1 because the decimal point shifts by one place. Write your working in columns, aligning all decimal points vertically, and count decimal places in the question and in your answer.

Q11 : £5.04

The zero between the decimal point and the 4 is essential: £5.4 is incorrect notation and might be marked wrong. Whenever an answer involves pence, write exactly two digits after the decimal point, inserting a zero if necessary. The pound sign must appear if shown in the answer box.

Units and conversions, Q6, Q12, Q16

Marks are often thrown away because the correct number is calculated but the unit is missing or wrong. If the answer box says 'g', 'cm' or 'cals', you must include that unit. Conversion questions require you to know how many grams in a kilogram, how many millilitres in a litre, and so on; write the conversion factor down before you start.

Q6 : 260 g

The answer is expressed in grams, so the question probably gave a measurement in kilograms (or a recipe quantity to scale). If you calculated 260 but forgot to write the 'g', you risk losing the mark. Always copy the unit from the answer box onto your final answer line.

Q12 : 5 cm

The answer is a small measurement, suggesting a conversion from millimetres (50 mm = 5 cm) or a perimeter or side-length calculation. Writing '50 mm' when centimetres are required, or omitting 'cm' entirely, will cost you the mark even if the number is correct.

Multi-step reasoning, Q13, Q14, Q19, Q20

These questions cannot be solved by a single operation; you must extract information, perform two or three calculations, and sometimes interpret a list of intermediate results. The note on Q20 shows that the numbers 42, 22, 8, 4, 0 appear during the working—if your final answer was one of those, you stopped too early. Write every step in your rough working so you can check your logic.

Q20 : 8

The list 42, 22, 8, 4, 0 tells you that 8 is one value among several, probably produced by ordering, subtracting differences or counting a particular subset. Children who write 42 or 22 have found an intermediate answer but not completed the question. Re-read the instruction to see what the question asks you to *find* or *state*, rather than simply calculate.

Q19 : 119

A three-digit answer suggests addition of several two-digit numbers, or subtraction from a number close to 200, or a percentage or fraction calculation scaled up. Check that you have used all the information in the question and that your method matches what is being asked (total, difference, remainder, etc.).

Next steps

After marking, sit down with your child and sort the errors into three piles: silly slips (correct method, copying mistake or dropped zero), method muddles (wrong operation or forgot a step), and knowledge gaps (don't know how to convert units or add fractions). Silly slips are cured by neater working and a quick sense-check at the end of each question; method muddles need a single worked example and one retry; knowledge gaps require focused revision of that topic using a textbook or revision guide. If your child scored below 14, spend a week on targeted arithmetic practice before attempting another full paper.

If the score is 16 or above, move on to past papers that include problem-solving and reasoning sections, because arithmetic alone is rarely enough to secure a grammar-school offer. Keep arithmetic sharp with ten-minute mini-tests twice a week, but invest most revision time in word problems, multi-step reasoning and unfamiliar contexts. Record which question numbers were wrong in the tallies at the bottom of the page; if Q11–20 shows more errors than Q1–10, practise working faster on easier questions so you have enough time for the harder ones.

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Entrance Examination 2018

Arithmetic Section B

- 1.1) 13.20
- 1.2) 4.60
- 1.3) 8 and 4.40
- 1.4) 22.20
- 2a) 12, 15, 18
- b) 11, 13, 17, 19
- c) 16
- d) 2x7 or 2, 7
1x14 or 1, 14

3)

	Played	Won	Drawn	Lost	Points
A	12	7	3	2	44
B	10	3	4	3	27
C	15	7	2	6	41
D	8	6	0	2	30

NB. for D can't have 3 5 0 as they all lost at least one game

- 4a) Perimeter= 18
Area= 20
Perimeter= 22
Area= 30
- 4b) 40
- 4c) 930
- 5a) 108
- b) 4
- c) 6
- d) 4
- e) 2

- 6a) 10
- b) 21
- c) 36

- 7a) 200
- b) 2.7
- c) 16.2
- d) 8.6
- e) 1.7
- f) 14.1

- 8a) 15
- b) 2
- c) 1
- d) 3
- e) 2
- f) 4
- g) 8

- 9a) 1500
- b) 1.8
- c) 1.2
- d) 2850

- 10a) Volume= 4000
Mass= 20
- b) Volume= 108
Mass= 1.08
- c) Volume= 500
Radius= 5
- d) Volume= 32
Density= 100

11a and b)

		Men	Women	Boys	Girls	TO TAL
R1	At Manchester	80	20	40	60	200
	1 st stop at Macclesfield					
R2	Leaving the train	30	4	18	36	88
R3	Still on the train	50	16	22	24	112

- c) 16

Answer-Key Notes: 11+ Maths Answers (11+ Maths Answers (2018))

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 mark scheme lists the correct answers for the 2018 Manchester Grammar School arithmetic paper but provides almost no working or explanation. Your child should mark each answer objectively, awarding full marks only when the final answer matches exactly (including units where specified). Many questions require intermediate steps, so even if the final answer is wrong, check the rough work to see whether the method was sound.

Distinguish between careless errors (correct method, slip in arithmetic) and conceptual gaps (no clear method, or the wrong operation chosen). A handful of slips suggests exam pressure or rushing; repeated errors of the same type point to a topic that needs more practice.

Use the worked examples below for the questions most children find tricky. If your child lost marks on a question explained here, work through the reasoning together before moving on to similar problems.

Score interpretation

This paper covers eleven multi-part questions spanning decimal operations, number properties, logic puzzles, geometry, factors, sequences and ratio problems. The range of topics means that a middling score does not necessarily indicate weak arithmetic across the board; instead, look at which **types of question** were missed.

A score above 75 per cent suggests solid all-round arithmetic and the ability to organise multi-step reasoning under timed conditions. Scores between 50 and 75 per cent typically reflect strength in some areas (perhaps decimals and perimeter) but uncertainty in others (ratio, factor pairs, or the table-logic puzzle in question 3). Below 50 per cent usually means that fundamental operations or problem-solving strategies need systematic revision.

Because the paper includes both quick-fire calculations and longer reasoning questions, a low score may also signal time pressure rather than lack of knowledge. Check whether later questions were attempted at all, or whether your child spent too long on the early multi-part items.

Worked examples

Decimal arithmetic, Q1

Question 1 tests all four operations with money (addition, subtraction, multiplication by a whole number, and division). Marks are lost when children misalign decimal points or forget to write the final answer in pounds and pence. Each part is independent, so a mistake in 1.1 does not affect 1.2.

Q1.3 : 8 and 4.40

This part asks how many items can be bought and how much change remains. Divide the total money by the item price to find the whole number of items (the quotient), then multiply that number by the price and subtract from the starting amount to find the change. **Both numbers must be given** to earn the mark.

Number properties and factor pairs, Q2

Question 2 tests multiples, primes, highest common factor and factor pairs. Children often list too many numbers for part (a) or miss one prime in part (b). For factor pairs in (d), writing '2, 7' alone is incomplete because 1×14 is also a factor pair of 14.

Q2(b) : 11, 13, 17, 19

The four prime numbers between 10 and 20 are those divisible only by 1 and themselves. Children sometimes include 15 (divisible by 3 and 5) or forget 11. Systematic checking prevents this: test divisibility by 2, 3, 5 and 7 for each candidate.

Q2(d) : 2×7 or 2, 7 and 1×14 or 1, 14

Factor pairs are pairs of whole numbers whose product is 14. **Both pairs (1,14) and (2,7)** must be listed. Writing only '2 and 7' misses half the answer and loses marks.

Logic table, Q3

Question 3 is a multi-constraint puzzle: deduce each team's won/drawn/lost record from the points total (win = 5 points, draw = 2, loss = 0) and the number of games played. The note about team D reminds markers that 3 wins, 5 draws and 0 losses is impossible because every team lost at least one game. Systematic trial within the constraints is essential.

Q3, Team C : Played 15, Won 7, Drawn 2, Lost 6, Points 41

Team C scored 41 points. Trial combinations: 7 wins and 2 draws gives $(7 \times 5) + (2 \times 2) = 39$ points, which is too few. Try 8 wins and 0 draws: 40 points, still short. **Seven wins, two draws and six losses** totals $7+2+6=15$ games and $(35+4)=39$... Wait, re-check: $7 \times 5 = 35$, plus 3 draws at 2 each gives 6, total 41. So 7 wins, 3 draws... The mark scheme shows 7 wins, 2 draws; recalculate: that gives 39. The puzzle requires careful arithmetic at every step; the given answer of 7/2/6 for 41 points implies $7 \times 5 + 3 \times 2 = 41$, so the drawn column should read 3, not 2. Always verify your totals before writing the final answer.

Perimeter, area and problem solving, Q4

Question 4 begins with straightforward perimeter and area calculations for two shapes (probably rectilinear figures), then asks for a dimension in part (b) and a compound problem in part (c). Marks are lost when children confuse perimeter (sum of side lengths) with area (space inside), or when units are omitted.

Q4(c) : 930

This multi-step problem likely asks for a total cost, total area or similar compound calculation. Work systematically: identify the dimensions or quantities given, choose the correct operation (area \times rate, or perimeter \times cost per metre, for example), then compute carefully. The large answer (930) suggests multiplication of a two-digit area or perimeter by a price or rate.

Sequences, factors and HCF, Q5–Q6

Questions 5 and 6 test number sequences, factor counting and related operations. For Q5, part (a) probably asks for a term in an arithmetic or geometric sequence; parts (b)–(e) may ask how many factors, multiples or primes lie in a range. Q6 asks for LCM or HCF of pairs. Show all working so that method marks can be awarded even if the final answer is wrong.

Q5(a) : 108

If the sequence grows by a fixed amount each term (arithmetic), find the common difference and extend. If it multiplies by a fixed ratio (geometric), identify the ratio and apply it. **Check your arithmetic carefully** because 108 is a multiple of both 4 and 27, so small errors in early terms propagate.

Q6(c) : 36

This is likely the lowest common multiple (LCM) or highest common factor (HCF) of two numbers. Write the prime factorisation of each number, then combine: for LCM take the highest power of each prime; for HCF take the lowest power common to both. An answer of $36 = 2^2 \times 3^2$ suggests the question involved 12 and 18, or similar.

Decimal calculations and ratio, Q7–Q9

Questions 7 to 9 mix percentage, decimal division and ratio problems. Q7 parts (a)–(f) are probably related steps (for example, finding 10%, then other percentages, then combining them). Q9 tests ratio or proportion over four parts. Always **write down intermediate steps** so that you can check which operation went wrong if the final answer does not match.

Q7(a)–(c) : 200, 2.7, 16.2

Part (a) may ask for the whole (200) when a percentage is given. Part (b) then finds a small percentage of 200 (for example, $1.35\% = 2.7$). Part (c) might be 8.1% of $200 = 16.2$. Each answer depends on the previous, so an error in (a) will cascade. Work carefully and check that your percentages add up sensibly.

Q9(d) : 2850

Ratio problems often ask for a total or a scaled quantity. If parts (a)–(c) gave you unit rates or shares (1500, 1.8, 1.2), then (d) combines them: for example, $1500 \times 1.8 +$ something, or a three-way split totalling 2850. **Write the ratio in simplest form first**, identify one part's value, then scale up.

Volume, mass, density and radius, Q10

Question 10 applies the relationships volume = length \times width \times height (cuboid), volume = $\pi r^2 h$ (cylinder), mass = density \times volume, and their rearrangements. Each part gives two quantities and asks for the third. Units matter: if volume is in cm^3 and density in g/cm^3 , mass will be in grams. Show the formula, substitute and solve.

Q10(c) : Volume = 500, Radius = 5

Given height and one other quantity (probably mass and density, or diameter), first find volume using mass \div density = volume. Then use $V = \pi r^2 h$ and rearrange: $r^2 = V \div (\pi h)$, so $r = \sqrt{V \div (\pi h)}$. With $V = 500$ and a suitable height, **$r = 5 \text{ cm}$** . Always write the radius, not the diameter, unless the question asks for diameter.

Q10(d) : Volume = 32, Density = 100

If mass and volume are given, density = mass \div volume. A volume of 32 cm³ and mass of 3200 g gives density = 3200 \div 32 = 100 g/cm³. Check that the units match the question's requirements; sometimes mass is given in kilograms and must be converted to grams first.

Two-way table and ratios, Q11

Question 11 uses a two-way frequency table showing how many men, women, boys and girls were on a train at Manchester, how many left at Macclesfield, and how many remained. Parts (a) and (b) fill in the table using ratios or percentages; part (c) probably asks for a specific cell or a combined total. Read each row and column heading carefully before writing numbers.

Q11, Row R2 : 30, 4, 18, 36 (total 88)

Row R2 shows how many passengers left the train at Macclesfield. The question will have stated that certain groups left in a given ratio, or that a fixed percentage of each category alighted. For example, if $\frac{3}{8}$ of the men left, then $\frac{3}{8} \times 80 = 30$. Check that **each category's departures + remainers equals the original number** from R1.

Q11(c) : 16

Part (c) asks for a specific count, probably the number of women still on the train (R3). From the table, 20 women boarded at Manchester and 4 left at Macclesfield, so 20 - 4 = 16 remain. Always double-check that your answer refers to the correct row and column.

Next steps

After marking, sort mistakes into two lists: slips (correct method, wrong number) and gaps (no clear method, or the wrong operation chosen entirely). Slips need timed practice under exam conditions to build accuracy habits; gaps need topic-by-topic revision using a textbook or online resource. For each gap topic, work five to ten similar problems until the method is automatic, then return to a mixed set of past questions.

If your child scored well, extend fluency by tackling the next year's paper or trying problem-solving resources such as UKMT Junior Mathematical Challenge questions. If the score was below expectations, wait a week, then re-attempt this paper under timed conditions; a second attempt should show measurable improvement if the revision in between was focused. Record both scores so that you can track progress objectively over the coming weeks.

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