2024 national curriculum tests

Key stage 2

Mathematics test mark schemes

Paper 1: arithmetic
Paper 2: reasoning
Paper 3: reasoning

Standards & Testing Agency

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1. Introduction

The Standards and Testing Agency (STA) is responsible for the development and delivery of statutory tests and assessments. STA is an executive agency of the Department for Education.

The 2024 tests assess the national curriculum. This test has been developed to meet the specification set out in the test framework[1] for mathematics at key stage 2.

A new test and new mark schemes will be produced each year.

Key stage 2 tests are marked by external markers, who receive training to ensure the mark schemes are applied consistently and fairly. The mark schemes are provided to show teachers how the tests are marked. The pupil examples are based on responses gathered from the test trialling process.

Scaled score conversion tables are not included in this document. Conversion tables will be produced as part of the standards maintenance process. Scaled score conversion tables[2] for the 2024 tests will be published in July 2024. The standards confirmation meeting will take place in June 2024.

2. Structure of the test

The key stage 2 mathematics test comprises:

- Paper 1: arithmetic (40 marks)
- Paper 2: reasoning (35 marks)
- Paper 3: reasoning (35 marks)

3. Content domain coverage

The 2024 test meets the specification in the test framework. Table 1 sets out the areas of the content domain that are assessed in Papers 1, 2 and 3.

The references are taken from the test framework. A question assessing 4C7, for example, sets out to 'multiply two-digit and three-digit numbers by a one-digit number using a formal written layout' and is taken from the year 4 programme of study.

1 www.gov.uk/government/publications/key-stage-2-mathematics-test-framework
2 www.gov.uk/guidance/scaled-scores-at-key-stage-2

Table 1: Content domain coverage of the 2024 key stage 2 mathematics test

Where 2 or more references are given, the primary reference is given first.

Paper 1: arithmetic	
Qu.	**Content domain reference**
1	3C2
2	3C7
3	4C7
4	4C2
5	4C7
6	4C2
7	4C6b
8	4C6b
9	5F10/5F8
10	4C7
11	4C6b
12	3C2
13	4C6b
14	6F5a
15	4C6b
16	6N3
17	5C6b
18	5F4
19	6F4
20	6C7a
21	5C5d/6C9
22	6F9a
23	6C9
24	5F10/4F8/4C2
25	6C7a
26	5F4
27	6F5b
28	6F4
29	6F9b
30	6C7b
31	6R2
32	6F5b
33	6R2
34	6F4
35	5F5
36	6C7b

Paper 2: reasoning	
Qu.	**Content domain reference**
1	4G2c/5P2
2	3M9a/3C1
3	3S2/3S1/3C1
4	6N5/6A3
5	4C7
6	3N6/3N2a/3N3
7	5C6a
8	5N4/4N4b
9	4F9
10	6C5
11	6R1/4C6a
12	5F2b/4M7b
13	6G2b/6G2a
14	4F10a/3F4/4C6a
15	6F9a
16	6N3
17	5M9a/4F10b/3C4
18	6M5/4N4a
19	4C4
20	5M4/4M5
21	3G2
22	6S3/3S1/5F10
23	6C7b/6F2
24	6C5/5C5d
25	6A4/4C3
26	6P3/4P2
27	6R2

Paper 3: reasoning	
Qu.	**Content domain reference**
1	3F2
2	5N5
3	4F10b/3M9a/4M9
4	4N4b
5	5N3b
6	6F2
7	4C3/3C8/4C8
8	6P2
9	4N1/5C8a/4C6a
10a	3M7/4M7a
10b	6G4a/5G4c
11	3C2/3C4
12	6F3/6F6
13	5M9c/6F9b/6C8
14	6S1
15	6R2/6C8
16	6F11
17	5C5a
18	5M9a
19	6C7c/6C8
20	6G2a/5G4a
21	6C8/5C8c/6C7a
22a	6A2/6C9
22b	6A2/4C3/6C9
23	6G2b
24	6F5a/6F3

4. Explanation of the mark schemes

The marking information for each question is set out in the form of tables (sections 7, 8 and 9).

The purpose of the mark scheme is to define the acceptable answers for each question within the test. Answers other than those listed may be acceptable if they meet the marking criteria.

The '**Qu.**' column on the left-hand side of each table provides a quick reference to the question number and part.

The '**Requirement**' column may include two types of information:

- a statement of the requirements for the award of each mark, with an indication of whether credit can be given for an appropriate method
- examples of some different types of correct answer

The '**Mark**' column indicates the total number of marks available for each question part.

The '**Additional guidance**' column indicates alternative acceptable answers and guidance, such as the range of acceptable answers, where necessary. This column may also provide details of specific types of answer which are unacceptable. For most questions, there will be unacceptable answers that are not listed.

5. General marking guidance

5.1 Applying the mark schemes

To ensure consistency of marking, the most frequent procedural queries are listed in section 5.2 along with the action the marker will take. This is followed by further guidance in section 6 relating to marking questions involving money, time and other measures. Unless otherwise specified in the mark scheme, markers will apply these guidelines in all cases.

Recording marks awarded

Pupils' test papers are scanned so that marking can be conducted on screen by trained markers.

For each question, markers record the award of 3, 2, 1 or 0 marks as appropriate, according to the mark scheme criteria. There is provision in the software to record questions not attempted. The software aggregates marks automatically.

5.2 General marking principles

Table 2: General marking principles for all papers

1. The answer does not closely match any of the examples given in the mark scheme.	Markers will use their judgement to decide whether the answer corresponds with details in the 'Requirement' column of the mark scheme. Reference will also be made to the 'Additional guidance' column.
2. The answer is provided in a non-standard way.	Pupils may provide evidence in any form as long as its meaning can be understood. Diagrams, symbols or words are acceptable for explanations or for presenting an answer.
3. The correct answer or working has been crossed out or erased and not replaced.	The mark(s) will not be awarded for crossed-out or erased answers or working.
4. More than one answer is given.	If all answers given are correct (or a range of answers is given, all of which are correct), the mark(s) will be awarded unless the mark scheme states otherwise. If both correct and incorrect answers are given, the mark(s) will not be awarded unless the mark scheme states otherwise.
5. No answer is given in the expected place, but the correct answer is given elsewhere.	Where a pupil has unambiguously indicated the correct answer, the mark(s) will be awarded. In particular, where a word or number is expected, a pupil may meet the requirement by annotating a graph or labelling a diagram elsewhere in the question.
6. The answer is correct, but the wrong working is shown.	A correct final answer will be awarded the mark(s).
7. The pupil has used alternative notation for a decimal point in a number.	No alternative notation is accepted as representing a decimal point in a number, for example, a comma. Refer to section 6 for guidance on marking specific types of question.
8. The pupil has used a symbol as a thousands separator.	If the pupil has used a comma as a thousands separator (positioned either correctly or incorrectly) and the digits are in the correct order, then the mark(s) will be awarded. If any other symbol, for example, a decimal point or apostrophe, is used, the mark(s) will not be awarded, although method marks may still be available.

9. The answer in the answer box is wrong due to a transcription error.	A transcription error occurs when a pupil miscopies their answer from the end of their working into the answer box. Each part (integer, numerator, denominator) of a mixed number is considered separately when applying transcription error rules. Where appropriate, detailed guidance will be given in the mark scheme. For questions with no guidance, marks will only be awarded for a transcription error if the wrong answer is due to: • transposed digits in a number (for example, 243 is written as 324) **OR** • one digit changed in a number of 4 or more digits (for example, 2,345 is written as 2,845) The mark(s) will not be awarded for any other transcription error including: • a decimal point positioned incorrectly (for example, 12.34 is written as 1.234 or 1234) • a change by a power of 10 (for example, 200 is written as 20 or 2,000) • a digit added or removed (for example, 123,456 written as 1233,456 or 12,456) • a negative sign added or removed
10. The answer is numerically or algebraically equivalent to the answer in the mark scheme.	Answers should be given as single values in their simplest form unless the mark scheme states otherwise, for example, for $\square = 536 - 30$, the answer $500 + 6$ will not be awarded the mark. For integer answers, for example, 20, the answer $\frac{20}{1}$ will be awarded the mark; $\frac{80}{4}$ will not be awarded the mark. For decimal answers that include recurring digit(s), there must be an unambiguous indication of the recurring digit(s). For example, for $\frac{1}{6}$, $0.1\dot{6}$ or $0.1\overline{6}$ will be awarded the mark and for $\frac{1}{7}$, $0.\dot{1}42857\dot{}$ or $0.\overline{142857}$ will be awarded the mark. For fraction answers that can be expressed as a mixed number, the fraction paired with the integer must be a proper fraction, for example, $1\frac{6}{4}$ will not be awarded the mark although method marks may still be available. Where alternative responses are acceptable, this will be indicated in the 'Additional guidance' column.

Table 3: General marking principles for paper 1 only (arithmetic)

11. The answer in the answer box is wrong due to a misread of numbers given in the question.	Misreads are not allowed in Paper 1; the mark(s) will not be awarded.
12. The pupil has not recorded their working beneath the given long multiplication or long division.	If a pupil carries out their working somewhere on the page other than beneath the given question as expected, then the pupil must start by rewriting the original question in order for it to be considered as a formal method. Please note that the operation sign does not need to be given for long multiplication, provided the pupil's working shows the intention to multiply.
13. The answer to the long division question expresses a remainder.	If a pupil reaches an integer answer using a formal method with no more than one arithmetic error, for example, 25, then the mark(s) will be awarded for 25 r0 or 25.0, but the mark(s) will not be awarded for an answer of 250 For answers with a remainder, the remainder must be expressed correctly. If a pupil shows a remainder that is the same size as the divisor or larger, for example, a remainder of 28 or 29 when dividing by 28, the mark(s) will not be awarded because the method is incomplete. If a pupil reaches a non-integer answer using a formal method with no more than one arithmetic error, for example, when dividing by 28, the pupil reaches the answer 6 r14, then the mark(s) will be awarded for $6\frac{14}{28}$ or 6.5, but the mark(s) will not be awarded for 6 r$\frac{14}{28}$ or 6.14 or 614
14. The long division method involves subtracting chunks of different sizes.	If a pupil's formal method involves subtracting chunks, it is not necessary to show a separate addition of the chunks. If the answer is not the correct total for their chunks, then that is treated as one arithmetic error. A method is considered as chunking when the size of the chunks are shown alongside the algorithm. It should be noted that this method will only be accepted if all chunks are of different sizes.

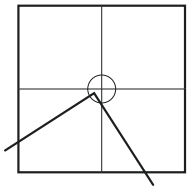
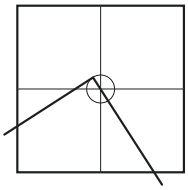
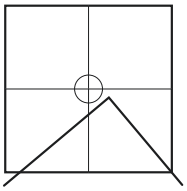
Table 4: General marking principles for papers 2 and 3 only (reasoning)

15. More than one method is given.	If a pupil gives more than one method, then the intended method is taken as the one which leads to the answer in the answer box or an identified answer elsewhere. If no answer is given, then all methods must be appropriate for the method mark(s) to be awarded.
16. There appears to be a misread of numbers or information given in the question that affects the pupil's working and/or explanation.	This occurs when a pupil misreads a number given in the question and consistently uses a different number that does not alter the original intention or difficulty of the question. For example, if 243 is misread and written as 248, both numbers may be regarded as comparable in difficulty. However, if 243 is misread and written as 245 or 240, the misread number may be regarded as making the question easier. The misread of a number may affect the award of marks. Any misread number must be seen, not implied. Where appropriate, detailed guidance will be given in the mark scheme. If no guidance is given, markers will examine each case to decide whether the mark(s) will be awarded. The mark(s) will not be awarded if: • it is a **ONE-mark** question • there is more than one misread number in a question • the mathematics is simplified • it is an 'explain' question • it is a misread of other information (not numbers) • the misread number is the same as any other number in the question For **TWO-mark** questions that have a method mark, one mark will be awarded if an appropriate method is correctly followed through with the misread number to give the correct follow-through answer, provided the mathematics has not been simplified. For **THREE-mark** questions, refer to the additional guidance.
17. A misread or an arithmetic error results in an answer with multiple decimal places.	In some instances, a misread or an arithmetic error in a method leads to an answer with one or more decimal places. In such cases, the method mark(s) will be awarded for an answer that is correctly truncated or rounded provided the method is appropriate and the additional guidance does not specify otherwise. For example, 1.2345 is truncated to 1.2

18. The pupil has reversed values within a calculation involving subtraction or division.	When values within the calculation are reversed, the mark(s) will only be awarded when the answer corresponds to the correct calculation. For example, if the correct calculation is 12 ÷ 4, the method mark(s) may be awarded for 4 ÷ 12 = 3, but not for an answer other than 3 Reversed values within a calculation are not acceptable in 'explain' questions.
19. The pupil omits an operation sign within their working.	If the correct sign of +, − , ×, or ÷ for an arithmetic operation is missing, then the mark(s) will only be awarded if the working shown by the pupil is clear enough to indicate that the required operation has been performed. This applies even if the results of the required operation are incorrect. Where carrying or decomposition figures are seen, this is evidence of intention. For example, where the following is seen in working, the layout of the response implies addition or subtraction: 456 123 ___ • if the answer is larger than the greater of the given values, for example, 679, then addition is implied • if the answer is less than the first given value, for example, 323, then subtraction is implied

20. The pupil has used 'an appropriate method'.	For some questions, the mark scheme allows the award of the method mark(s) for 'evidence of an appropriate method', even if the answer is missing or incorrect. Refer to the 'Additional guidance' column where appropriate. For the award of the method mark(s) for an appropriate method, there must be evidence of **all** the steps of the appropriate method (any method that would lead to the correct answer if there were no arithmetic errors and no additional steps). This means that, for every step, either: • the appropriate calculation to be carried out must be shown **OR** • if the calculation has not been written down, the correct answer or correct follow-through answer must be shown Where the calculation shown would lead to a correct final answer, even if the processed numbers do not appear to be taken from the question, a method mark may be awarded unless the mark scheme specifies otherwise.
21. The pupil has used a trial and improvement method.	'Trial and improvement' is regarded as an acceptable method, unless the mark scheme states otherwise. For a 'trial and improvement' method to be awarded the method mark(s): • there must be at least 3 trials, carried out correctly, which all reduce the range in which the answer is known to lie • there can be additional trials, which are correctly or incorrectly carried out, and which may not reduce the range in which the answer is known to lie • a final answer is not needed, unless the mark scheme states otherwise

22. The answer in the answer box is wrong but the correct answer is reached in the working.	Extra working occurs when a pupil writes the correct answer in their working, and then continues to process the information further. When the answer in the answer box is wrong and does not match the answer reached in the working, it is impossible to know why the pupil has written a different answer and it is assumed that extra working has occurred. GMP 9 on transcription errors still applies. If the extra working does not contradict the pupil's appropriate method, the method mark(s) will be awarded. If the extra working contradicts the pupil's appropriate method, the method mark(s) will not be awarded.
23. The pupil miscopies a value from one part of their method into the next part.	There will be instances when a pupil reaches a value in their working, then restarts from a different value. The mark(s) will not be awarded if: • it is a **ONE-mark** question • there is more than one miscopy in the working • the miscopy does not follow transcription error rules (see GMP 9) The method mark(s) will only be awarded if an appropriate method is correctly shown using the miscopied number (which must follow transcription error rules).
24. The correct answer is embedded in the working.	An embedded answer occurs when a pupil shows the correct answer within their working but then selects the wrong answer from their working as their final answer or leaves the answer box blank. For example, if a pupil shows $2.5 \times 6 = 3 \times 5$ in the last line of their working and writes 5 in the answer box, whereas the correct answer is 3, then this will affect the award of marks. Where appropriate, detailed guidance will be given in the mark scheme. If no guidance is given, markers will examine each case to decide whether the mark(s) will be awarded. For **ONE-mark** questions, the mark will not be awarded. For **TWO-mark** questions that have a method mark, one mark will be awarded, provided the pupil does not give redundant extra working that contradicts work already done or which adds to their appropriate method. For **THREE-mark** questions, refer to the additional guidance.

25. The phrase 'sight of' is used in the mark scheme.	For some questions, the mark scheme allows the mark(s) to be awarded for sight of a particular number or numbers within a method. Such numbers are the correct answers to partial steps within a method.
26. The answer correctly follows through from earlier incorrect work.	'Follow-through' marks for an answer will only be awarded when specifically stated in the mark scheme.
27. The pupil has drawn lines which do not meet at the correct point.	Where the mark scheme states that 'slight inaccuracies in drawing' should be accepted, this means that the mark(s) will be awarded for responses marked within or on a circle of radius 2mm with its centre at the correct point.  within the circle – accepted  on the circle – accepted  outside the circle – not accepted

6. Marking specific types of question: summary of additional guidance

6.1 Answers involving money

	Accept	Do not accept
Where the £ sign is given, for example: £3.20, £7 £	£3.20 £7 £7.00 Any unambiguous indication of the correct amount, for example: £3.20p £3 20 pence £3 20 £3-20 £3:20 £3;20	Incorrect placement of pounds or pence, for example: £320 £320p Incorrect placement of decimal point or incorrect use or omission of 0 or use of comma as a decimal point, for example: £3.2 £3 200 £32 0 £3-2-0 £3,20
Where the p sign is given, for example: 40p p	40p Any unambiguous indication of the correct amount, for example: £0.40p 0 40p £0-40p 0:40p £0;40p	Incorrect or ambiguous use of pounds or pence or use of comma as a decimal point, for example: 0.40p £40p £0,40p

	Accept	Do not accept
Where a unit is not given, for example: £3.20, 40p ☐	£3.20 40p 320p £0.40 Any unambiguous indication of the correct amount, for example: £3.20p £0.40 pence £3 20 pence £0 40p £3 20 £0-40 £3-20 £0:40 £3:20 £0;40 £3;20 £.40 3.20 0.40 320 40 3 pounds 20	Incorrect or ambiguous use of pounds or pence or use of comma as a decimal point, for example: £320 £40 £320p £40p £3.2 0.4 3.20p 0.40p £3,20 0,40 £0,40p

6.2 Answers involving time

	Accept	Do not accept
A time interval, for example: 2 hours 30 minutes	2 hours 30 minutes Any unambiguous, correct indication, for example: (0)2 h 30 150 minutes (0)2 h 30 min 150 (0)2 30 2.5 hours (0)2-30 $2\frac{1}{2}$ hours Digital electronic time, for example: (0)2:30 (0)2;30	Incorrect or ambiguous time interval or use of comma as a decimal point, for example: 2.30 230 2.3 2.30 min 2.3 hours 2,5 hours 2.3 h 2,30 2 h 3 1 h 90 min

	Accept	Do not accept
A specific time, for example: 8:40 am, 17:20	(0)8:40 am (0)8:40 twenty to nine Any unambiguous, correct indication, for example: (0)8.40 (0)8;40 0840 (0)8 40 (0)8-40 Unambiguous change to 12 or 24-hour clock, for example: 17:20 as 5:20 pm or 17:20 pm	Incorrect time, for example: 8.4 am 8.40 pm Incorrect placement of separators, spaces, etc. or incorrect use or omission of 0 or use of a comma as a decimal point, for example: 840 8:4:0 8.4 084 8,40

6.3 Answers involving measures

	Accept	Do not accept
Where units are given, for example: 8.6 kg kg m l	8.6 kg Any unambiguous indication of the correct measurement, for example: 8.60 kg 8.6000 kg 8 kg 600 g	Incorrect or ambiguous use of units or use of comma as a decimal point, for example: 8600 kg 8 kg 600 8,60 kg 8,6000 kg

If a pupil gives an answer with a unit different from the unit in the answer box, then their answer must be equivalent to the correct answer provided, unless otherwise indicated in the mark scheme.

If a pupil leaves the answer box empty but writes the answer elsewhere on the page without any units, then that answer is assumed to have the units given in the answer box, subject to the conditions listed above.

7. Mark schemes for Paper 1: arithmetic

Qu.	Requirement	Mark	Additional guidance
1	727	1m	
2	24	1m	
3	138	1m	
4	4,513	1m	
5	1,173	1m	
6	8,641	1m	
7	1,100	1m	
8	990	1m	
9	21.173	1m	
10	6,768	1m	
11	80	1m	
12	268	1m	
13	187	1m	
14	$\frac{4}{48}$	1m	Accept equivalent fractions or the **exact** decimal equivalent, e.g. $\frac{1}{12}$ or $0.08\dot{3}$ (accept any unambiguous indication of the recurring digits). **Do not** accept rounded or truncated decimals.
15	90	1m	
16	20,000	1m	
17	2,671,000	1m	
18	$\frac{9}{12}$	1m	Accept equivalent fractions or the **exact** decimal equivalent, e.g. $\frac{3}{4}$ or 0.75 **Do not** accept rounded or truncated decimals.

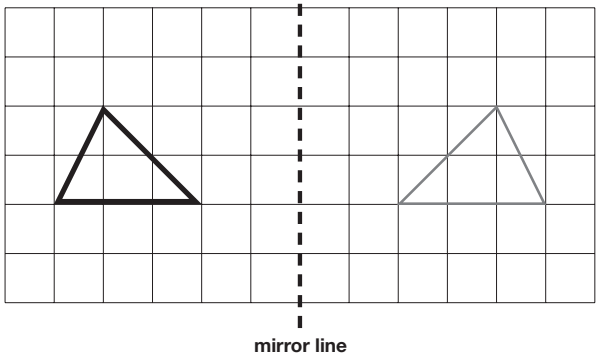
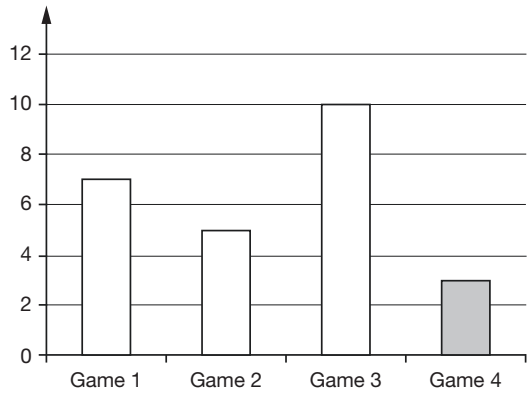
Qu.	Requirement	Mark	Additional guidance
19	$1\frac{7}{15}$ **OR** $\frac{22}{15}$	**1m**	Accept equivalent mixed numbers, fractions or the **exact** decimal equivalent, i.e. $1.4\dot{6}$ (accept any unambiguous indication of the recurring digits). **Do not** accept rounded or truncated decimals.
20	Award **TWO** marks for the correct answer of 88,368 If the answer is incorrect, award **ONE** mark for the formal method of long multiplication with no more than **ONE** arithmetic error, e.g. • 6312 × 14 = 25248 + 63120 = 88358 (*error*) **OR** • 6312 × 14 = 24248 (*error*) + 63120 = 87368	**Up to 2m**	Working must be carried through to reach a final answer for the award of **ONE** mark. **Do not** award any marks if the error is in the place value, e.g. the omission of the zero when multiplying by tens. 6312 × 14 = 25248 + 6312 (*place value error*) = 31560
21	29	**1m**	
22	0.155	**1m**	
23	83	**1m**	
24	57.2	**1m**	

Qu.	Requirement	Mark	Additional guidance
25	Award **TWO** marks for the correct answer of 19,646 If the answer is incorrect, award **ONE** mark for the formal method of long multiplication with no more than **ONE** arithmetic error, e.g. • $\begin{array}{r} 418 \\ \times\ 47 \\ \hline 2926 \\ 16720 \\ \hline 19640 \end{array}$ (*error*) **OR** • $\begin{array}{r} 418 \\ \times\ 47 \\ \hline 2924 \\ 16720 \\ \hline 19644 \end{array}$ (*error*)	**Up to 2m**	Working must be carried through to reach a final answer for the award of **ONE** mark. **Do not** award any marks if the error is in the place value, e.g. the omission of the zero when multiplying by tens. $\begin{array}{r} 418 \\ \times\ 47 \\ \hline 2926 \\ 1672 \\ \hline 4598 \end{array}$ (*place value error*)
26	$\frac{7}{21}$	**1m**	Accept equivalent fractions or the **exact** decimal equivalent, e.g. $\frac{1}{3}$ or $0.3\dot{3}$ (accept any unambiguous indication of the recurring digits). **Do not** accept rounded or truncated decimals.
27	$\frac{7}{20}$	**1m**	Accept equivalent fractions or the **exact** decimal equivalent, i.e. 0.35 **Do not** accept rounded or truncated decimals.
28	$1\frac{3}{4}$ **OR** $\frac{7}{4}$	**1m**	Accept equivalent mixed numbers, fractions or the **exact** decimal equivalent, i.e. 1.75 **Do not** accept rounded or truncated decimals.

Qu.	Requirement	Mark	Additional guidance
29	18.2	**1m**	
30	Award **TWO** marks for a correct answer of 29 If the answer is incorrect, award **ONE** mark for the formal methods of division with no more than **ONE** arithmetic error, e.g. • long division algorithm, e.g. 29 r 6 34) 986 – 680 306 – 300 (*error*) 6 **OR** 28 (*error*) 34) 986 – 680 20 × 34 306 – 306 9 × 34 0 • short division algorithm, e.g. 2 8 (*error*) 34) 98 30 6	**Up to 2m**	Working must be carried through to reach a final answer for the award of **ONE** mark. Short division methods **must** be supported by evidence of appropriate carrying figures to indicate the use of a division algorithm and be a complete method. The carrying figure must be less than the divisor.
31	594	**1m**	**Do not** accept 594%
32	$\frac{1}{6}$	**1m**	Accept equivalent fractions or the **exact** decimal equivalent, i.e. $0.1\dot{6}$ (accept any unambiguous indication of the recurring digits). **Do not** accept rounded or truncated decimals.
33	387	**1m**	**Do not** accept 387%

Qu.	Requirement	Mark	Additional guidance
34	$1\frac{1}{2}$ **OR** $\frac{3}{2}$	**1m**	Accept equivalent mixed numbers, fractions or the **exact** decimal equivalent, i.e. 1.5 **Do not** accept rounded or truncated decimals.
35	$48\frac{3}{4}$ **OR** $\frac{195}{4}$	**1m**	Accept equivalent mixed numbers, fractions or the **exact** decimal equivalent, i.e. 48.75 **Do not** accept rounded or truncated decimals.
36	Award **TWO** marks for a correct answer of 58 If the answer is incorrect, award **ONE** mark for the formal methods of division with no more than **ONE** arithmetic error, e.g. • long division algorithm, e.g. 58 r2 73 | 4234 – 3650 584 – 582 (*error*) 2 **OR** 56 (*error*) 73 | 4234 – 3650 50 × 73 584 – 584 8 × 73 0 • short division algorithm, e.g. 5 6 (*error*) 73 | 423^{58}4	**Up to 2m**	Working must be carried through to reach a final answer for the award of **ONE** mark. Short division methods **must** be supported by evidence of appropriate carrying figures to indicate the use of a division algorithm and be a complete method. The carrying figure must be less than the divisor.

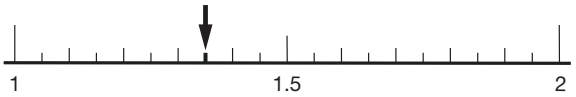
8. Mark schemes for Paper 2: reasoning

Qu.	Requirement	Mark	Additional guidance
1	Diagram completed, as shown:  	1m	Accept slight inaccuracies in drawing, provided the intention is clear. See page 13 for guidance.
2	Award **ONE** mark for two boxes ticked correctly, as shown: banana ✓ plum apple pear ✓	1m	Accept alternative unambiguous positive indication of the correct answer.
3	Award **ONE** mark for drawing the bar in the range 2.5 – 3.5 points, e.g.  	1m	Ignore the width of the bar.

Qu.	Requirement	Mark	Additional guidance
4	Award **ONE** mark for the correct order, as shown: –11 **–5** 1 7 **13** 19	1m	**Do not** accept 5–
5	Award **ONE** mark for all three boxes completed correctly, as shown: **2** 5 **4** × 3 7 **6** 2	1m	
6	238	1m	
7	1,000	1m	
8	Award **ONE** mark for a correct number in each box: Any whole number in the range **3,500 – 4,499** inclusive. Any whole number in the range **815,000 – 824,999** inclusive.	1m	Both numbers must be correct for the award of the mark.
9	0.4	1m	
10	Award **ONE** mark for the correct numbers circled, as shown: 15 **17** **19** 21 23 25	1m	Accept alternative unambiguous positive indication of the correct answer.

Qu.	Requirement	Mark	Additional guidance
11	Both boxes completed correctly, as shown: **Age in years** / **Number of children** / **Number of adults** / **Number of children per adult** 1 and under: 12 / 4 / 3 2 or 3: 20 / **5** / 4 4 or 5: **24** / 3 / 8	1m	
12	Award **ONE** mark for all four labels matched correctly, as shown: Shape **W** → $\frac{1}{100}$ Shape **X** → $\frac{1}{4}$ Shape **Y** → $\frac{2}{5}$ Shape **Z** → $\frac{1}{10}$	1m	Lines need not touch the labels or fractions, provided the intention is clear. **Do not** accept any label matched to more than one fraction.
13	Award **ONE** mark for all four shape names matched correctly, as shown: cube → 9 square-based pyramid → 8 triangular-based prism → 6 octagonal-based pyramid → 5	1m	Lines need not touch the shape names or numbers, provided the intention is clear. **Do not** accept a shape name matched to more than one number.
14	28	1m	
15	32.07	1m	

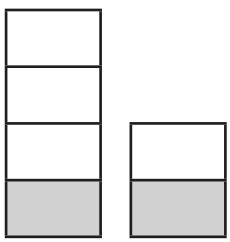
Qu.	Requirement	Mark	Additional guidance
16	Award **TWO** marks for two boxes ticked correctly, and no incorrect boxes ticked, as shown: The digit 5 represents 50,000 ✓ The value of the digit 9 is nine hundred thousands. ☐ The digit 6 represents 6 millions. ☐ The value of the digit 2 is twenty tens. ✓ If the answer is incorrect, award **ONE** mark for: • two boxes ticked correctly and one incorrect box ticked **OR** • only one box ticked correctly and no incorrect boxes ticked.	**Up to 2m**	Accept alternative unambiguous positive indication of the correct answer.
17	Award **TWO** marks for the correct answer of (£)2.50 If the answer is incorrect, award **ONE** mark for evidence of an appropriate complete method which contains no more than **ONE** arithmetic error, e.g. • £1.50 + £0.70 + £1.45 = £3.65 £10.00 – £3.65 = £6.15 (*error*) £6.15 – £3.85 = £2.30 **OR** • £1.50 + £0.70 + £1.45 + £3.85 = £7.50 £10.00 – £7.50 = £3.50 (*error*) If no final answer is given, all calculations within an appropriate method must be evaluated correctly for the award of **ONE** mark, e.g. • £1.50 + £0.70 + £1.45 = £3.65 £10.00 – £3.65 = £6.35 £6.35 – £3.85	**Up to 2m**	Accept for **ONE** mark an answer of £250, £250p, £2,50 or £2.5 as evidence of an appropriate method. Refer to section 6.1 on pages 14 and 15 for additional guidance on marking answers involving money. Misreads of £3.85 as £3.65 **OR** miscopies of £3.65 as £3.85 are not allowed.

Qu.	Requirement	Mark	Additional guidance
18	Award **ONE** mark for an arrow drawn to 1.35kg, as shown:  	**1m**	Accept alternative unambiguous positive indication of the correct answer.
19	Award **TWO** marks for the correct answer of 330 If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. • 1,250 – 40 = 1,210 1,210 – 880 **OR** • 1,250 – 880 = 370 370 – 40 **OR** • 880 + 40 = 920 1,250 – 920	**Up to 2m**	Answer need not be obtained for the award of **ONE** mark.

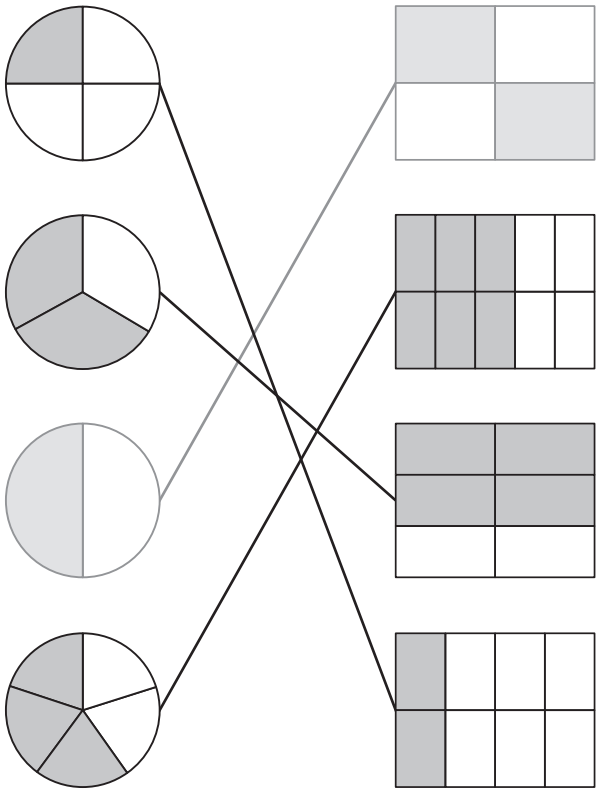
Qu.	Requirement	Mark	Additional guidance
20	Award **TWO** marks for the correct answer of 5 (hours) 25 (minutes) If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. • 10:15 to 10:30 = 15 mins 12:40 to 1:30 = 50 mins 15 + 50 = 65 mins 65 × 5 = 320 mins (*error*) 320 ÷ 60 **OR** • 10:15 to 10:30 = 15 mins 15 mins × 5 = 75 mins 12:40 to 1:30 = 50 mins 50 mins × 5 = 260 mins (*error*) 75 mins + 260 mins = 335 mins 335 ÷ 60 = 5 hrs 35 mins Award **ONE** mark for sight of: • 75 **AND** 250 (*as evidence of an appropriate method*) **OR** • 325 (minutes)	**Up to 2m**	Answer need not be obtained for the award of **ONE** mark. Accept for **ONE** mark a correct answer given in hours **OR** minutes only, written either as a mixed number fraction or an exact decimal equivalent, e.g. • $5\frac{25}{60}$ (hours) *blank* (minutes) **OR** • $5.41\dot{6}$ (hours) *blank* (minutes) **OR** • *blank* (hours) 325 (minutes)
21	Award **ONE** mark for two boxes ticked correctly, as shown: AB is parallel to CD ☐ GH is parallel to AB ☑ CD is perpendicular to GH ☑ EF is perpendicular to CD ☐	**1m**	Accept alternative unambiguous positive indication of the correct answer.

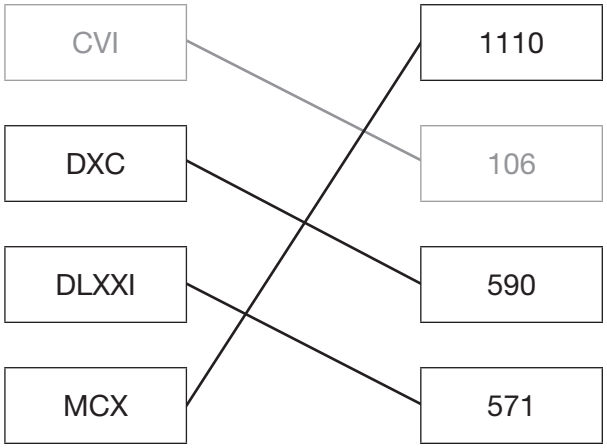
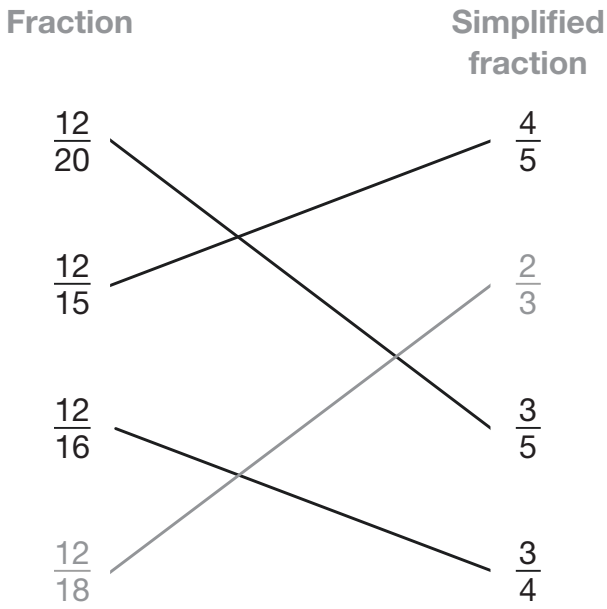
Qu.	Requirement	Mark	Additional guidance
22	Award **TWO** marks for the correct answer of 2.7 If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. • 1.8 + 2.4 + 3.2 + 1.6 + 4.5 = 13.5 13.5 ÷ 5	**Up to 2m**	Answer need not be obtained for the award of **ONE** mark. Any correct rounding or truncating of the answer does not negate an appropriate method. Any answer which does not result from correct rounding or truncating implies an additional step not shown.
23	Award **TWO** marks for the correct answer of $\frac{4}{12}$ If the answer is incorrect, award **ONE** mark for evidence of an appropriate complete method, e.g. • 940 ÷ 12 = 78 remainder 5 (*error*) 5 out of 12 = $\frac{5}{12}$ • $12\overline{)940}$ 78 r2 (*error*) Final answer = $\frac{2}{12}$ Award **ONE** mark for sight of: • 78 r4 **OR** • 78.33 **OR** 78.3 **OR** • $0.3\dot{3}$ **OR** 0.33 **OR** $\frac{33}{100}$	**Up to 2m**	Accept for **TWO** marks an exact equivalent fraction, e.g. $\frac{1}{3}$

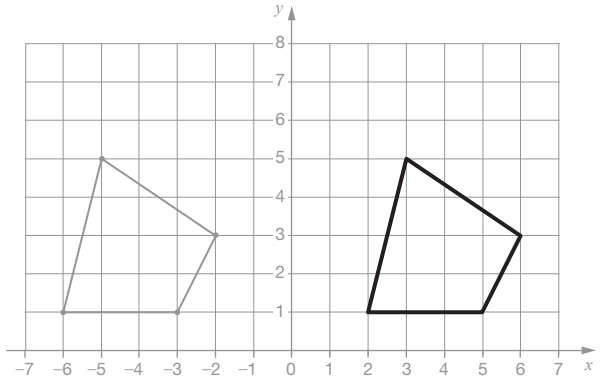
Qu.	Requirement	Mark	Additional guidance
24	Award **TWO** marks for all boxes completed correctly, as shown: **100** is a square number. **64** is a cube number. **60** is a common multiple of **4** and **5** **40** is a common factor of **80** and **120**	**Up to 2m**	**Do not** accept any numbers not given in the question.
	If the answer is incorrect, award **ONE** mark for any three correct statements, as long as each of the three correct statements has a different number, e.g. **64** is a square number. **100** (*error*) is a cube number. **60** is a common multiple of **4** and **5** **40** is a common factor of **80** and **120** **OR** **64** is a square number. **64** (*repeat*) is a cube number. **100** is a common multiple of **4** and **5** **40** is a common factor of **80** and **120**		**Do not** accept any statement where more than one number is given.

Qu.	Requirement	Mark	Additional guidance
25	Award **TWO** marks for both boxes completed correctly, as shown: a = **4**, 13 b = 2, **5** If the answer is incorrect, award **ONE** mark for: • one box completed correctly.	**Up to 2m**	
26	Award **ONE** mark for two boxes ticked correctly, as shown: from (0, 2) to (4, 2) ☐ from (6, 8) to (2, 8) ☑ from (–3, 5) to (–7, 5) ☑	**1m**	Accept alternative unambiguous positive indication of the correct answer.
27	Award **ONE** mark for an explanation that shows that the two quantities are equal, e.g. • If there are 100 beads in Jar A and 50 beads in Jar B, 25% of A is 25 which is the same as 50% of 50 **OR** • 50% is double 25% so 50% of a half is equal to 25% of a whole **OR** • A quarter equals half of a half. **OR** • Diagrams as part of an explanation if they show clearly that 50% of the half is equal to 25% of the whole, e.g. 	**1m**	**Do not** accept responses that restate the question, e.g. • Because Jar B is half the amount of Jar A. **Do not** accept vague or incomplete explanations, e.g. • 25 + 25 = 50 **Do not** accept explanations which include incorrect mathematics or incorrect information that is relevant to the explanation. **Do not** accept diagrams alone where the widths are unequal.

9. Mark schemes for Paper 3: reasoning

Qu.	Requirement	Mark	Additional guidance
1	Award **ONE** mark for all three pairs of shaded fractions matched correctly, as shown: 	1m	Lines need not touch the shaded fractions, provided the intention is clear. **Do not** accept a shaded circle matched to more than one shaded rectangle.
2	–30	1m	**Do not** accept 30–
3	Award **TWO** marks for the correct answer of (£)1.15 If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. • £1.45 + £2.40 = £3.85 £5.00 – £3.85 **OR** • £5.00 – £1.45 = £3.55 £3.55 – £2.40	Up to 2m	Answer need not be obtained for the award of **ONE** mark. Accept for **ONE** mark an answer of £115, £115p or £1,15 as evidence of an appropriate method. Refer to section 6.1 on pages 14 and 15 for additional guidance on marking answers involving money.
4	3,500	1m	

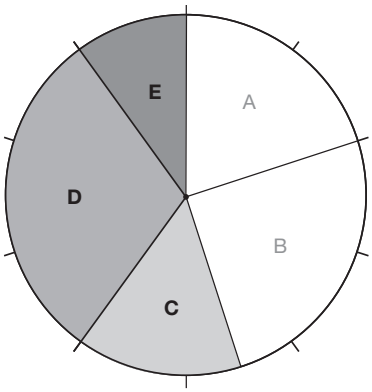
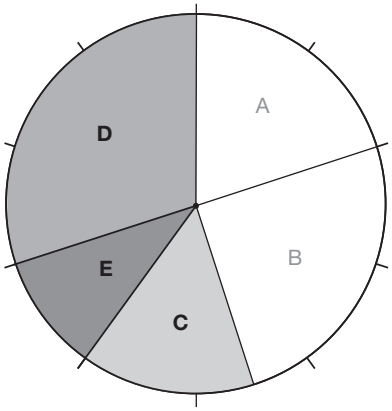
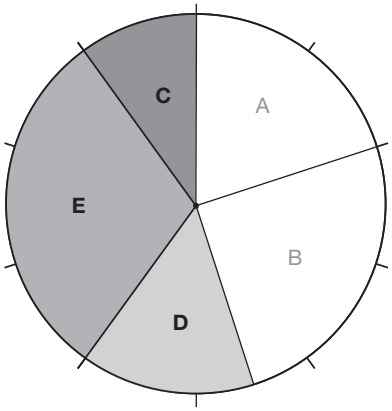
Qu.	Requirement	Mark	Additional guidance
5	Award **ONE** mark for all three Roman numerals matched correctly, as shown:  	1m	Lines need not touch the Roman numerals or numbers, provided the intention is clear. **Do not** accept a Roman numeral matched to more than one number.
6	Award **ONE** mark for all three fractions matched correctly, as shown:  	1m	Lines need not touch the fractions, provided the intention is clear. **Do not** accept a fraction matched to more than one simplified fraction.
7	8	1m	

<table>
<tr><th>Qu.</th><th>Requirement</th><th>Mark</th><th>Additional guidance</th></tr>
<tr><td>8</td><td>Award ONE mark for the diagram completed, as shown:
 
</td><td>1m</td><td>Accept slight inaccuracies in drawing, provided the intention is clear.

See page 13 for guidance.</td></tr>
<tr><td>9</td><td>Award ONE mark for the table completed with the three correct answers, as shown:

<table><tr><th>Number of weeks</th><th>Number of days</th></tr><tr><td>1</td><td>7</td></tr><tr><td>2</td><td>14</td></tr><tr><td>4</td><td>28</td></tr><tr><td>6</td><td>42</td></tr><tr><td>10</td><td>70</td></tr><tr><td>15</td><td>105</td></tr></table></td><td>1m</td><td></td></tr>
<tr><td>10a</td><td>Award ONE mark for answers given in the range 202 – 218 (mm) inclusive.</td><td>1m</td><td></td></tr>
<tr><td>10b</td><td>Award ONE mark for answers given in the range 53° – 57° inclusive.</td><td>1m</td><td></td></tr>
</table>

Qu.	Requirement	Mark	Additional guidance
11	Award **TWO** marks for three boxes completed correctly, as shown: 5 7 **3** – 3 **0** 5 **2** 6 8 If the answer is incorrect, award **ONE** mark for any two boxes completed correctly.	**Up to 2m**	
12	Award **ONE** mark for the correct order, as shown: $\frac{1}{5}$ $\frac{3}{4}$ $\frac{8}{10}$ $\frac{7}{8}$ least	**1m**	Accept equivalent fractions or exact equivalent decimals. Accept fractions in reverse order **AND** the label 'least' changed to follow suit.
13	Award **TWO** marks for the correct answer of 99(kg) If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. • 8 × 4 = 32 2 × 13 = 26 4 × 6.5 = 26 6 × 2.5 = 15 32 + 26 + 26 + 15	**Up to 2m**	Accept for **TWO** marks, 99,000g as the final answer in working and the answer box blank **OR** 99,000 in the answer box where the kg has been replaced with grams (g). Accept for **ONE** mark 99,000 kilograms (kg) in the answer box **OR** as the final answer in working and the answer box blank. Answer need not be obtained for the award of **ONE** mark.

Qu.	Requirement	Mark	Additional guidance
14	Award **TWO** marks for three sectors drawn **AND** labelled correctly, e.g.  **OR**  If the answer is incorrect, award **ONE** mark for one sector drawn **AND** labelled correctly. **OR** Three sectors drawn correctly but either unlabelled **OR** labelled incorrectly, e.g.  	**Up to 2m**	Accept slight inaccuracies in the drawing of the sectors as long as the intention is clear. Accept sectors C, D and E drawn in any order as long as each sector is drawn correctly.

Qu.	Requirement	Mark	Additional guidance
15	Award **TWO** marks for the correct answer of 79 If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. • 680 ÷ 10 = 68 68 × 3 = 204 68 ÷ 2 = 34 204 + 34 = 238 238 – 159 **OR** • 680 ÷ 100 × 35 = 238 238 – 159 Award **ONE** mark for sight of 238 (as evidence of 35% of 680 calculated correctly)	**Up to 2m**	Answer need not be obtained for the award of **ONE** mark.
16	Award **ONE** mark for a whole number answer in the range 61 – 69 (inclusive).	**1m**	**Do not** accept answers with the % sign, e.g. 61%
17	Award **ONE** mark for three boxes ticked correctly as shown: 2 ✓ 3 ✓ 4 ☐ 8 ☐ 9 ✓	**1m**	Accept alternative unambiguous positive indication of the correct answer.
18	Award **TWO** marks for the correct answer of 25 If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g. • 10 × £2 = £20 £65 – £20 = £45 £45 ÷ £3 = 15 weeks 15 + 10	**Up to 2m**	Answer need not be obtained for the award of **ONE** mark. Award **ONE** mark for an answer of 15

Qu.	Requirement	Mark	Additional guidance
19	Award **TWO** marks for both boxes completed correctly, as shown:  Award **ONE** mark for one box completed correctly.	**Up to 2m**	
20	Award **ONE** mark for the correct answer of B, C **AND** D.	**1m**	Accept correct letters in any order. Accept alternative unambiguous positive indication of the correct answer.
21	Award **THREE** marks for the correct answer of (£)4,655 Award **TWO** marks for: • an incorrect answer with evidence of an appropriate complete method with no more than one arithmetic error, e.g. 635 × £27 = £17,045 (*error*) £17,045 – £3,180 = £13,865 £13,865 ÷ 3 = £4,621.66 **OR** • for sight of (£)13,965 (as evidence of two steps completed correctly) Award **ONE** mark for: • evidence of an appropriate method with more than one error **OR** • sight of (£)17,145 (as evidence of the multiplication step completed correctly).	**Up to 3m**	A misread of a number may affect the award of marks. No marks are awarded if there is more than one misread or if the mathematics is simplified. Any appropriate rounding or truncating of the answer does not negate an appropriate method. Any answer which does not result from correct rounding or truncating implies an additional step not shown. **TWO** marks will be awarded for an appropriate method with the misread number followed through correctly. **ONE** mark will be awarded for evidence of an appropriate method using the misread number followed through correctly with no more than one error. Answer need not be obtained for the award of **ONE** mark.
22a	40	**1m**	
22b	7	**1m**	

<table>
<tr><th>Qu.</th><th>Requirement</th><th>Mark</th><th>Additional guidance</th></tr>
<tr><td>23</td><td>Award ONE mark for the table completed with the three correct answers, as shown:
<table><tr><th>Name of 3-D shape</th><th>Number of faces</th></tr><tr><td>cube</td><td>6</td></tr><tr><td>pentagonal prism</td><td>7</td></tr><tr><td>triangular-based pyramid</td><td>4</td></tr></table></td><td>1m</td><td></td></tr>
<tr><td>24</td><td>Award ONE mark for an explanation that compares the calculations or relative size of the fractions to indicate relative size of the products, e.g.
• $\frac{1}{2} \times \frac{5}{6} = \frac{5}{12}$
$\frac{5}{12} = \frac{10}{24}$
$\frac{1}{3} \times \frac{7}{8} = \frac{7}{24}$
OR
• $\frac{10}{24} > \frac{7}{24}$</td><td>1m</td><td>Do not accept responses that restate the question.
Do not accept vague, incomplete or incorrect explanations, e.g.
• the result is bigger because it’s a half
• shows the products without supporting calculations or further proof, e.g.
$\frac{5}{12}$ is bigger than $\frac{7}{24}$
Do not accept explanations which include incorrect mathematics or incorrect information that is relevant to the explanation.</td></tr>
</table>

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Standards & Testing Agency

2024 key stage 2 mathematics test mark schemes
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