Year group:	5
Type of test:	End of Year
Test content:	Reasoning
Power Maths topic:	Books 5A, 5B and 5C Revision of Year 4 Book 4A, Unit 1 and 4, Book 4C, Unit 11. Revision of Year 3 Book 3A, Unit 1, Book 3B, Unit 6, Book 3C, Unit 10.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
1	**406**	1	**Possible incorrect answer 46 (An answer like this may suggest children have omitted the 0 in the tens column)** This may suggest children have not appreciated the importance of 0 as a place holder to separate the hundreds and ones. This may mean that the child has not understood the value of the 100s and seen the place value grid as four tens and six ones. This revision topic is covered in Book 3A, Unit 1, Lesson 2.	Children can represent 3-digit numbers using base 10 equipment and write them into a part-whole model. Children can recognise that a 3-digit number is made up of some 100s, some 10s and some 1s.

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2	**£7·30**	1	**Possible incorrect answer £12·70 (An answer like this may suggest children have added £10 and £2·70)** Children may have misinterpreted the question. **Possible incorrect answer £8·30 (An answer like this may suggest children have counted up from £2·70 incorrectly and have counted the pence to the next pound (correctly) but have not adjusted the pounds and counted up from £2 to £10)** Children may not be confident with their number bonds to 100. **Possible incorrect answer £8·70 (An answer like this may suggest children have used column subtraction and seen 0 – 7 giving an answer of 7)** This may mean that children have not consolidated column subtraction. This revision topic is covered in Book 3B, Unit 6, Lesson 5.	Children can subtract amounts of money given in pounds and pence in the context of finding change.
3	**$\frac{3}{10}$**	1	**Possible incorrect answer $\frac{5}{10}$ (An answer like this may suggest children have calculated $\frac{6}{10}$ minus $\frac{1}{10}$)** **Possible incorrect answer $\frac{7}{10}$ (An answer like this may suggest children have added $\frac{6}{10}$ and $\frac{1}{10}$)** Children can find it difficult to identify exactly what the question is asking. Instead of applying their knowledge of fractions, this uncertainty can lead them to guess at the answer. This revision topic is covered in Book 3C, Unit 10, Lesson 8.	Children can recognise the operation needed to answer a word problem. They can write the necessary calculation to answer the problem and successfully find and write the correct answer.

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4	**0, 1 or 2** Award 1 mark for all or any of these.	1	**Possible incorrect answer 3 or more (An answer like this may suggest children are focusing on the hundredths digit)** When comparing decimals, children may not start by looking at the largest place value and then the next largest place value and so on. This revision topic is covered in Book 4C, Unit 11, Lessons 4 and 7.	Children can order decimals using a place value grid and place value counters. They start by looking at the largest place value.
5	**D (84 m)**	1	**Possible incorrect answer A 42 m (An answer like this may suggest children have added the visible numbers)** **Possible incorrect answer B 61 m (An answer like this may suggest children have used the length of the vertical side and doubled it but only added the given horizontal sides)** Children may think that they are unable to find a shape's perimeter unless they are given every side length. This topic is covered in Book 5A, Unit 6, Lesson 2.	Children can solve problems involving the perimeters of rectilinear shapes, particularly those shapes where not all the side measurements are provided. Children can derive unknown measurements and then find the overall perimeter.
6	**9,000**	1	**Possible incorrect answer: any wrong number (An answer like this may suggest children are not confident in continuing a sequence that does not start at 0)** This revision topic is covered in Book 4A, Unit 1, Lesson 4.	Children can count in 1,000s from 0 to 10,000, forwards and backwards. Children should recognise what 1,000 looks like and be able to write numbers in words and numerals.

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7	**A $^{6}/_{15}$ and C $^{2}/_{5}$** Both answers are required for 1 mark.	1	**Possible incorrect answer A $^{6}/_{15}$ and B $^{4}/_{13}$ (An answer like this may suggest children think that they need to subtract the same number from a fraction to find an equivalent fraction)** **Possible incorrect answer C $^{2}/_{5}$ and D $^{5}/_{8}$ (An answer like this may suggest children think that they need to add the same number from a fraction to find an equivalent fraction)** Children may add or subtract instead of multiplying or dividing when finding equivalent fractions. This topic is covered in Book 5B, Unit 8, Lesson 1.	Children can recognise and find equivalent fractions for a given fraction. They can recognise and explain the links between equivalent fractions using the correct mathematical vocabulary and can confidently represent equivalent fractions in concrete, pictorial and abstract ways.
8	**C (rhombus)**	1	**Possible incorrect answer A, B or D (An answer like this may suggest children have selected a regular shape)** Children may rely on visual intuition which will lead to misidentification in certain cases. This topic is covered in Book 5C, Unit 14, Lesson 4.	Children can recognise common regular polygons and can justify why a given polygon does or does not meet the criteria necessary to be regular, based on angle size and lengths of sides.
9	**C (9,099)**	1	**Possible incorrect answer D 999 (An answer like this may suggest children have forgotten to use zero as a place holder)** Children may have forgotten that the zero is needed to show place value. **Possible incorrect answer A 9,000,099 or B 900,099 (An answer like this may suggest children have misread 9,000 at the beginning of the numbers as nine thousand)** Children often forget to use zero to show when a place has no value. This topic is covered in Book 5A, Unit 1, Lesson 1.	Children can say or write the value of each digit in numbers up to 10,000, representing them in different ways using manipulables, and can partition or build numbers using knowledge of 1,000s, 100s, 10s and 1s (explaining the role of zero as a place holder). Children can explain that when they count on or back in steps of 1,000, only the thousands value will change.

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10	**B (336)**	1	**Possible incorrect answer A 554 (An answer like this may suggest children have seen 4 as the final digit and assumed it can be divided by 4)** **Possible incorrect answer D 242 (An answer like this may suggest children have seen the first two digits, 24, and thought that as these can be divided by 4, the whole number can be divided by 4)** Children may make assumptions based on other facts, for example, all even numbers are divisible by 4. This topic is covered in Book 5B, Unit 7, Lesson 10.	Children can confidently assess whether an answer will have a remainder without the need to work out the division calculation, showing understanding of types of numbers and multiples.
11	**B (8)**	1	**Possible incorrect answer C 12 (An answer like this may suggest children have just focused on the fact that 12 is a multiple of 4)** **Possible incorrect answer A 2 and D 80 (An answer like this may suggest children have made an incorrect selection)** Children may confuse the term 'factor' with the term 'multiple' and find multiples instead of factors. This topic is covered in Book 5A, Unit 5, Lessons 1 and 4.	Children can reliably find factors and multiples and confidently solve mathematical puzzles and problems.
12	**40,065** **Award 2 marks for a correct answer.** Award 1 mark for a correct method but an incorrect answer. For example: 31,535 – 1,780 = 29,755 29,755 + 10,310 = wrong answer	2	**Possible incorrect answer 33,315 (An answer like this may suggest children have added 31,535 and 1,780)** **Possible incorrect answer 43,625 (An answer like this may suggest children have added 31,535, 1,780 and 10,310)** Children may not notice that the vocabulary used in the problem can be used to work out what calculation is needed. This topic is covered in Book 5A, Unit 3, Lesson 10.	Children can solve problems that involve a combination of adding and subtracting whole numbers with more than 4 digits and make multiple exchanges.

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13	**Accept an answer in the range 17 (°C) to 18 (°C) inclusive.**	1	**Possible incorrect answer 3 ½ (An answer like this may suggest children have counted the squares and not considered the scale on the vertical axis)** Children may not read intermediate values on a more complex scale accurately. **Possible incorrect answer 12 (°C) to 13 (°C) or 22 (°C) to 23 (°C) (An answer like this may suggest children have miscalculated)** Children may have difficulties in explaining what a dual line graph shows. This topic is covered in Book 5A, Unit 4, Lesson 4.	Children can accurately read information from line graphs, including dual line graphs. Children can solve simple sum and difference problems using data from the line graphs with increasingly complex scales.
14	**2 $\frac{1}{10}$ l** **Award 2 marks for a correct answer.** Award 1 mark for a correct method, for example: $\frac{1}{5} \times 4 = \frac{4}{5}$ $2\frac{9}{10} - \frac{4}{5}$ = wrong answer $2\frac{9}{10} - \frac{8}{10}$ = wrong answer	2	**Possible incorrect answer 2 $\frac{7}{10}$ (An answer like this may suggest children have calculated $2\frac{9}{10} - \frac{1}{5}$ indicating that they have not realised they need to find the capacity of four glasses)** **Possible incorrect answer 2 $\frac{5}{5}$ (An answer like this may suggest children have calculated $2\frac{9}{10} - \frac{4}{5}$, subtracting the numerators and the denominators)** **Possible incorrect answer 2 $\frac{5}{10}$ (An answer like this may suggest children have calculated $2\frac{9}{10} - \frac{4}{10}$, instead of changing $\frac{4}{5}$ to $\frac{8}{10}$)** Children may believe there is only one way to solve a problem. This topic is covered in Book 5B, Unit 9, Lesson 12.	Children can identify what a problem is asking and create appropriate calculations. They will break down multi-step problems into smaller, more manageable steps, and be secure with methods for adding and subtracting fractions to solve word problems.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
15	**45 kg** **Award 2 marks for a correct answer.** Award 1 mark for a correct method, for example: 150 ÷ 10 = 15 15 × 3 = wrong answer	2	**Possible incorrect answer 15 kg (An answer like this may suggest children have divided 150 by 10)** This may mean that children have not read the question carefully and only completed the first part of the question. **Possible incorrect answer 5 kg (An answer like this may suggest children have divided 150 by 10 and divided the answer by 3)** This may mean that children have misunderstood the operations needed and used division for the second step instead of multiplication. This topic is covered in Book 5A, Unit 5, Lesson 9.	Children can reliably divide whole numbers by 10, 100 and 1,000, link their understanding of place value to their calculations and can represent their thinking using concrete, pictorial and abstract representations.
16	**16·66** Award 2 marks for a correct answer. Award 1 mark for a correct method, for example: 9·2 + 4·78 = 13·98 13·98 + 2·68 = wrong answer	2	**Possible incorrect answer 8·38 (An answer like this may suggest children have added 9·2 to 4·78, but aligned the numbers from right to left, then added 2·68 indicating that they may have not understood the importance of place value when setting out column addition)** **Possible incorrect answer 3·25 (An answer like this may suggest children have added 9·2 to 4·78, but aligned the numbers from right to left, giving an answer of 5·7 then repeated the same error when adding 2·68 indicating that they may have not understood the importance of place value when setting out column addition)** **Possible incorrect answer 11·3(0) (An answer like this may suggest children have added 9·2 and 4·78 and subtracted 2·68, meaning they have completed the first step correctly, but misunderstood the need to add 2·68 and subtracted 2·68 from 13·98)** Children may make mistakes when using column addition or subtraction. They may align the numbers from right to left rather than according to their place value. This topic is covered in Book 5C, Unit 12, Lessons 7 and 10.	Children can add and subtract decimals that have a different number of decimal places. They can use addition and subtraction to check the answers to their calculations.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
17	**Award 2 marks for correct answer of 1 hour 12 minutes or 72 minutes** Award 1 mark for evidence of understanding that Isla has to get the 15:43 train but with one mistake made, such as calculating the length of her journey as 24 minutes by not including her wait at the station.	2	**Possible incorrect answer 1.12 hours (An answer like this may suggest children have worked out the time taken is 1 hour 12 minutes but recorded the answer as part of an hour)** Children may think that they can express remainders as decimals, as with metric measures. This topic is covered in Book 5C, Unit 16, Lesson 9.	
18	**32°** **Award 2 marks for a correct answer** Award 1 mark for a correct method, for example: 90 + 58 = 148 180 – 148 = wrong answer	2	**Possible incorrect answer 52° (An answer like this may suggest children have added 58 and 90 and subtracted the answer from 200 indicating that they may think that the angles on a straight line total 200°)** **Possible incorrect answer 212° (An answer like this may suggest children have correctly added 90° and 58° and subtracted the total from 360°, mistaking the sum of angles on a straight line)** **Possible incorrect answer 148° (An answer like this may suggest children have completed only the first step of the problem)** It is a common error to find the complementary angles total 200° rather than 180°. This topic is covered in Book 5C, Unit 13, Lesson 5.	Children can explain how to calculate the missing angles on a straight line by reasoning about their knowledge of a half turn.
19	**4 ⅜ km** Allow equivalent fractions and decimals.	1	**Possible incorrect answer 5 ⅞ (An answer like this may suggest children have added 5 and ⅞)** Children may fail to understand what calculation is required. **Possible incorrect answer ³⁵⁄₄₀ (An answer like this may suggest children have multiplied the numerator and denominator by 5)** This may mean that children are unsure how to multiply a fraction by a whole number. This topic is covered in Book 5B, Unit 10, Lessons 2 and 7.	Children can solve problems that incorporate fractions as numbers, confidently interpreting the language used and fluently using mathematical operations. They can use appropriate methods, including bar models to solve problems, while competently explaining the steps in their own words.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
20	**A (573 × 32)** **Award 2 marks for a correct answer.** Award 1 mark for evidence of correct calculation of one or more of the incorrect sums.	2	**Possible incorrect answer B, C or D (An answer like this may suggest children have confused the multiplication facts or the process of long multiplication and made the wrong selection)** Children using the grid method may incorrectly multiply or incorrectly add numbers they have multiplied. This topic is covered in Book 5B, Unit 7, Lesson 5.	Children can use the grid method or long multiplication to multiply a 3-digit by a 2-digit number, demonstrating understanding of partitioning and place value, and using known multiplication facts and addition methods.
21	**32 sheets** **Award 2 marks for a correct answer.** Award 1 mark for a correct method, for example: 40 × 40 = 1,600 1,600 ÷ 50 = 32, but with no more than one computational error	2	**Possible incorrect answer 5 (An answer like this may suggest children have multiplied 50 by 40 and got an answer of 200, which has been divided by 40)** Children may assume that 40 × 50 = 200 (an equal number of zeros on either side of the equals sign). This topic is covered in Book 5A, Unit 5, Lesson 10.	Children can use their understanding of multiplying and dividing by 10, 100 and 1,000, and their understanding of multiplication facts, to reliably multiply and divide given numbers by multiples of 10. They can use this ability to solve mathematical problems, explaining their reasoning and giving clear evidence of their thinking.
22	**C**	1	**Possible incorrect answer B (An answer like this may suggest that children have made a visual comparison and picked rectangle B as the 'tallest')** **Possible incorrect answer D (An answer like this may suggest children that children have made a visual comparison and picked rectangle D as the 'widest')** Children may compare two shapes visually (for example, thinking that the taller or wider of the shapes has the larger area), rather than by calculating their specific areas. This topic is covered in Book 5A, Unit 6, Lessons 5 and 6.	Children can confidently compare the area of several rectangles. Children can calculate the area of a rectangle using the length × width relationship.

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23	**17,467** **Award 2 marks for a correct answer.** Award 1 mark for a correct method. For example: 61,004 – 15,446 = 45,558 45,558 – 28,091 = wrong answer	2	**Possible incorrect answer 17,567 (An answer like this may suggest children have subtracted 15,446 from 61,004, and then 28,091 from the answer which may mean that they have not made the correct exchange and only exchanged 1 ten leaving 9 tens behind)** Children may make mistakes where an exchange is needed because there are zeros in the bigger number. This topic is covered in Book 5A, Unit 3, Lesson 4.	Children can lay the column method out accurately and can use it to subtract whole numbers with more than 4 digits, including making multiple exchanges.
24	**35 boxes 1 left over** **Award 2 marks for a correct answer.** Award 1 mark for a correct method, but with one arithmetical error, for example: 23 × 12 = 276 276 + 5 = 281 281 ÷ 8 = wrong answer	2	**Possible incorrect answer 281 (An answer like this may suggest children have multiplied 23 by 12 and added 5 which may mean that the children have only completed the first step of the problem)** **Possible incorrect answer 34 with 4 left over (An answer like this may suggest children have multiplied 23 by 12 and divided the answer by 8 which many mean that they have not fully identified what the problem is asking)** **Possible incorrect answer 15 with 9 left over (An answer like this may suggest children have multiplied 23 by 8 and added 5, then divided by 12 which may mean that they have not identified what the question is asking)** Children may not identify what a problem is asking, and so multiply or divide with no real understanding. This topic is covered in Book 5B, Unit 7, Lesson 11.	Children can solve problems involving multiplication and division, fluently interpret remainders and deal with exchanges. They can use a variety of methods to solve problems and explain steps in their own words.

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25	**C (65, 35)**	1	**Possible incorrect answer A (40, 35) (An answer like this may suggest children have confused reflected and translated and translated the triangle)** **Possible incorrect answer B (35, 40) (An answer like this may suggest children have confused the *x*- and *y*-coordinates and also translated the shape)** **Possible incorrect answer D (35, 65) (An answer like this may suggest children have correctly reflected the triangle, but confused the *x*- and *y*-coordinates)** When the mirror line is parallel to the axes, children may not see that part of the coordinate stays the same. This topic is covered in Book 5C, Unit 15, Lesson 2.	Children can use coordinates to find a reflected point on a grid. They are able to use coordinates to calculate the new point/vertex of a shape by adding or subtracting rather than counting squares. Children can find the coordinates of a reflected 2D shape by plotting each vertex.

Mark range	Level
0 – 5	Below
6 – 12	Towards
13 – 21	Expected
22 – 27	Secure
28 – 31	Towards greater depth
32 – 35	Greater depth