Year group:	5
Type of test:	End of Half Term
Term:	Autumn 1
Test content:	Reasoning
Power Maths topic:	Book 5A, Units 1–3

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
1	**4,605**	1	**Possible incorrect answer 465 or 4,650 (An answer like this may suggest children do not understand the role of zero as a place holder)** Children often forget to use zero to show when a place has no value; for example, they may record three thousand and forty-five as 345, forgetting to use 0 to show there are no 100s in the 100s position. This topic is covered in 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. Children 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.
2	**1545**	1	**Possible incorrect answer 15,155 (An answer like this may suggest children do not understand XL = 40.)** Children may use numerals that are too small before a larger Roman numeral. For example, they may write 99 as IC (100 subtract 1) rather than XCIX (90 + 9). The only pairs of numbers that are used for this subtraction rule are IV, IX, XL, XC, CD and CM. So only I, X and C can be used in this way and they can only come before the two numbers above them in value. This topic is covered in Unit 1, Lesson 8.	Children can read and write Roman numerals using M, D, C, L, X, V and I. They can recognise and represent a year written in Roman numerals, and talk about other ways they are still used in everyday life.

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3	**7,950 48,399 54,025 54,205 56,864**	1	**Possible incorrect answer: placing 7,950 as the largest number (An answer like this may suggest children have looked only at the first digit, ignoring the number of digits in total)** When comparing whole numbers, children may not check the number of digits first – they may look only at the size of the first digit. For example, when comparing the numbers 23,200 and 5,345, children may think that 5,345 is larger because 5 is larger than 2. This topic is covered in Unit 1, Lesson 6.	Children can compare pairs of numbers up to 100,000, explaining which is larger and why. They can write or represent a group of 4- and 5-digit numbers in ascending or descending order.
4	**300,600** Accept alternative, unambiguous indications of the correct number.	1	**Possible incorrect answer: 6 placed elsewhere (An answer like this suggests children are insecure about place value)** Children may lack the necessary conceptual understanding of place value to solve this efficiently. This may present as an incorrect answer as seen above, or as inefficient workings on the page (using column addition to solve 300,000 + 600). Children's understanding of the written names of the numbers may inhibit their ability to accurately solve this question. This topic is covered in Unit 2, Lesson 1.	Children display a clear understanding of the value of individual digits in large numbers. Children can use their knowledge of place value to recognise and name numbers.
5	**50,000**	1	**Possible incorrect answer 51,000 (An answer like this suggests children have rounded to the nearest 1,000.)** **Possible incorrect answer 51,100 (An answer like this suggests children have rounded to the nearest 100)** Children's understanding of place value may inhibit their ability to accurately answer this question. In both examples children have chosen the wrong digit to round to in the given number. This topic is covered in Unit 1, Lesson 7.	Children can round 5-digit numbers to the nearest 10,000, 1,000, 100 or 10, explaining their decision each time. They can identify the digit they need to check in the number, depending on the degree of rounding.

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6	**180** and **140**	1	**Possible incorrect answer: other answers (An answer like this may suggest children have not identified the correct interval of 40)** Children may only look for additions within a sequence. Where a sequence involves multiplying, children may record it as a constantly changing addition. For example, the rule for the sequence 2, 4, 8, 16 may be recorded as + 2, + 4, + 8 instead of × 2. This topic is covered in Unit 2, Lesson 8.	Children can recognise patterns in number sequences, and continue sequences in either direction.
7	**81,732**	1	**Possible incorrect answer 71,622 (An answer like this may suggest children have forgotten to add the carrying figures)** Children may not know which place value column to start with when adding two whole numbers together. Children may not understand the concept of exchanging between columns. This topic is covered in Unit 3, Lesson 1.	Children can use the column method to add numbers confidently, with increasingly large numbers.
8	**500,070**	1	**Possible incorrect answer: 7 placed elsewhere (An answer like this suggests children are insecure about place values)** Children may lack the conceptual understanding of place value necessary to solve this efficiently. This may present as an incorrect answer as seen above, or as inefficient workings on the page (using column addition to solve 500,000 + 70). Children's understanding of the written names of the numbers may inhibit their ability to accurately solve this question. This topic is covered in Unit 2, Lesson 1.	Children can use their knowledge of place value to recognise and name numbers.

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9a	**£64,674**	1	**Possible incorrect answer <£50,000 (An answer like this may suggest children have added the value of only two cars)** Children may not know which place value column to start with when adding two whole numbers together. Children may not understand the concept of exchanging between columns. This topic is covered in Unit 3, Lessons 1 and 9.	Children use the written method of column addition to add whole numbers with more than 4 digits.
9b	**£11,645**	1	**Possible incorrect answer £2,854 or £8,791 (An answer like this may suggest children have used the wrong values)** **Possible incorrect answer £12,455 (An answer like this may suggest children have subtracted the smaller number from the larger in each column)** Children may just subtract the smaller digit from the larger digit in each column. Children may not know how to correctly set out the column method when subtracting two numbers that have a different number of digits. This topic is covered in Unit 3, Lessons 3 and 9.	Children recognise why exchanges are needed when subtracting whole numbers with more than 4 digits and can use the column method to find the answer. They can use comparison bar models to express a problem and show what they need to work out.
10a	**75,000**	1	**Possible incorrect answer 74,999 (An answer like this may suggest children believe they need a 9 to round up to a zero)** This topic is covered in Unit 1, Lesson 7.	Children can round up and down to any significant positive number.
10b	**84,999**	1	**Possible incorrect answer 79,999 (An answer like this may suggest children have chosen the largest number below 80,000, misunderstanding the term 'round' or misreading the question)** **Possible incorrect answer 85,000 (An answer like this may suggest children have not understood the rounding boundary. They may have pictured the numbers on a number line and simply selected one of the given intervals on the line)** This topic is covered in Unit 1, Lesson 7.	Children can round up and down to any significant positive number.

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11	**An arrow drawn on the mid-point between 600,000** and **700,000.** Accept any answers that are closer to 650,000 than to 600,000 or 700,000.	1	**Possible incorrect answer: arrow drawn elsewhere (An answer like this may suggest children have misinterpreted or miscounted the intervals on the number line)** Children may miscalculate, and so misinterpret, the unlabelled divisions on a number line. This topic is covered in Unit 2, Lesson 3.	Children can accurately identify or estimate where numbers lie on a range of number lines up to 1,000,000.
12	**43 °C**	1	**Possible incorrect answer 27 °C (An answer like this may suggest children have subtracted 8 from 35 and are uncertain about crossing zero when dealing with negative numbers)** Children may assume that negative numbers work in a similar way to positive numbers, for example that $^{-}5$ must be greater than $^{-}1$ because 5 is greater than 1. This topic is covered in Unit 2, Lesson 6.	Children can perform simple calculations involving negative numbers in context.
13	**276,208**	1	**Possible incorrect answer 476,208 (An answer like this may suggest children have added rather than subtracting)** This topic is covered in Unit 2, Lesson 2.	Children are confident with the place value of digits up to 1,000,000 and can use this to work out 100,000 more or less than a given number.
14	**MMXVIII**	1	**Possible incorrect answer: other answers (Analyse incorrect responses to see which letters have been used correctly/incorrectly)** Children may use numerals that are too small before a larger Roman numeral. For example, they may write 99 as IC (100 subtract 1) rather than XCIC (90 + 9). The only pairs of numbers that are used for this subtraction rule are IV, IX, XL, XC, CD and CM. So only I, X and C can be used in this way and they can only come before the two numbers above them in value. This topic is covered in Unit 1, Lesson 8.	Children can represent a variety of numbers using Roman numerals.

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15	**76**	1	**Possible incorrect answer 128 (An answer like this may suggest children have added 54 and subtracted 28 from 102)** Children may choose the wrong numbers when trying to identify the inverse calculation. This topic is covered in Unit 3, Lesson 8.	Children can identify an inverse operation and use it to solve simple problems or to check calculations and find errors.
16	**39,362 l**	1	**Possible incorrect answer 39,252 (An answer like this may suggest children have forgotten to add the carrying figures)** Children may not know which place value column to start with when adding two whole numbers together. This topic is covered in Unit 3, Lessons 1 and 9.	Children can use the column method to add numbers confidently, with increasingly large numbers.
17	**2,370 m** Accept for **1 mark** a complete, correct method, with an answer, which would produce the correct answer if executed correctly. e.g. 2,274 + 2,865 + 2,491 = answer A 10,000 – answer A = wrong answer	2	**Possible incorrect answer 7,630 (An answer like this may suggest children have added the distances given, but not performed the final subtraction)** Children may not notice that the vocabulary used in the problem can be used to work out what calculation is needed. Children may not carry out both steps of a 2-step problem. This topic is covered in Unit 3, Lessons 9 and 10.	Children can solve two-step problems which involve adding and subtracting whole numbers with more than 4 digits.
18	**⁻3 and ⁻8**	2	**Possible incorrect answer ⁻2 and ⁻6 or ⁻4 and ⁻10 (Answers like this may suggest children have calculated the interval incorrectly)** Children may assume that negative numbers work in a similar way to positive numbers, for example that ⁻5 must be greater than ⁻1 because 5 is greater than 1. This topic is covered in Unit 2, Lessons 6 and 8.	Children can explain what a negative number is, find negative numbers on a number line, and continue sequences which cross zero.

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19	**Award 2 marks for the correct answer of 118,341.** Or award 1 mark for • sight of 73,794 **AND** 44,547 **OR** • sight of 130,091 **AND** 11,750 **OR** • evidence of an appropriate method, e.g. • 74,994 – 1,200 = 73,794 55,097 – 10,550 = 44,547 73,794 + 44,547 = wrong answer or no answer • 74,994 + 55,097 = 130,091 1,200 + 10,550 = 11,750 130,091 – 11,750 = wrong answer or no answer.	2	**Possible incorrect answers will vary (children may make an arithmetical error at one or more of the three steps)** This topic is covered in Unit 3, Lessons 9 and 10.	Children are able to break down a word problem into mathematical steps, and calculate them accurately. They are able to talk about their method and to record it so that others can follow their thinking. Children are able to think of different ways to solve the same problem and discuss the benefits of each.
20	**Any two numbers which total 292,781** Accept for **1 mark** a complete, correct method, with an answer, which would produce the correct answer if executed correctly. e.g. 400,000 – 107,219 = Answer A Answer A partitioned into 2 numbers which total Answer A	2	**Possible incorrect answer 292,781 (An answer like this may suggest children have subtracted correctly, but not performed the second part of the calculation. Children who give more than two numbers for the answer have not been able to visualise the problem correctly)** Children may not notice that the vocabulary used in the problem can be used to work out what calculation is needed. Children may not carry out both steps of a 2-step problem. This topic is covered in Unit 3, Lessons 9 and 10.	Children can solve problems which involve adding and subtracting whole numbers with more than 4 digits.

Mark range	Level
0 – 5	Below
6 – 10	Towards
11 – 16	Expected
17 – 20	Secure
21 – 23	Towards greater depth
24 – 26	Greater depth