THIRD SPACE
LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

Rapid Reasoning

Year 6 | Week 5

This week, the new Year 6 objectives that are introduced continue to focus on **calculations with all four operations**.

Year 6 objectives introduced in a reasoning context for the first time this week focus on:

- dividing numbers with up to four digits by a two-digit whole number, including interpreting remainders based on the context of the question

- performing a range of mental calculations, including with mixed operations and whole numbers.

Children continue to be exposed to the following objectives from week 4:

- multiplying numbers with up to four digits by a two-digit whole number

- addition and subtraction questions from the Year 5 curriculum, involving adding and subtracting numbers with more than four digits

- multi-step problems, involving a range of calculation skills.

Note that, unlike questions from the arithmetic paper, in reasoning questions, the formal method for multiplication/division is **not** required for the award of method marks.

Q1 Two decimal numbers add together to equal 1.

One of the numbers is 0.007.

What is the other number?

_____

1 mark

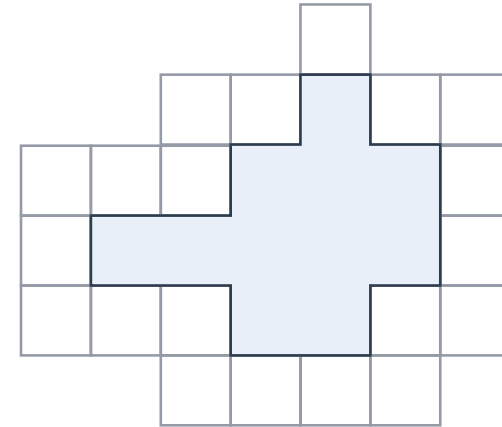**Q2** Pineapples are delivered to supermarkets in trays of 14.

Save-a-lot supermarket ordered 462 pineapples.

How many trays of pineapples will they receive?

pineapples

2 marks

Q3 Here is a set of squares around a shaded space.

What is the area of the shaded space?

squares

1 mark

Q1 Two decimal numbers add together to equal 1.

One of the numbers is 0.007.

What is the other number?

0.993

1 mark

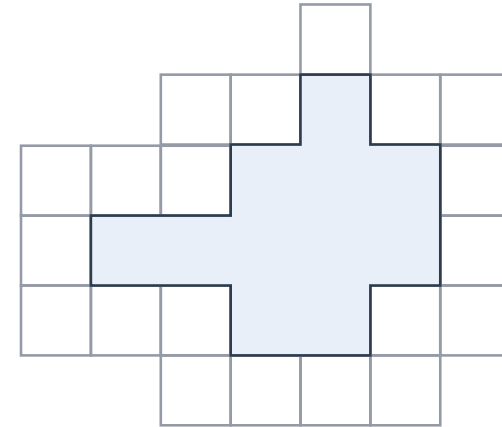**Q2** Pineapples are delivered to supermarkets in trays of 14.

Save-a-lot supermarket ordered 462 pineapples.

How many trays of pineapples will they receive?

33 pineapples

2 marks

Q3 Here is a set of squares around a shaded space.

What is the area of the shaded space?

11 squares

1 mark

|	Requirement	Mark	Additional guidance
Q1	0.993	1	
Q2	Award **TWO** marks for the correct answer of 33. Award **ONE** mark for evidence of an appropriate method, e.g. 462 ÷ 14 = wrong answer.	2	The calculation must be performed and an answer reached for the award of **ONE** mark.
Q3	11	1	

Q1 Write in the missing digits.

$$223 \times \boxed{}7 = 14{,}94\boxed{}$$

___
1 mark

Q2 Here is part of a number line.

Fill in the missing boxes.

0   12

___
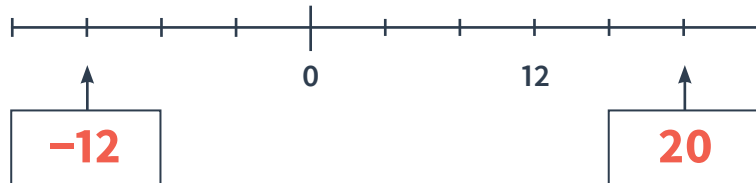2 marks
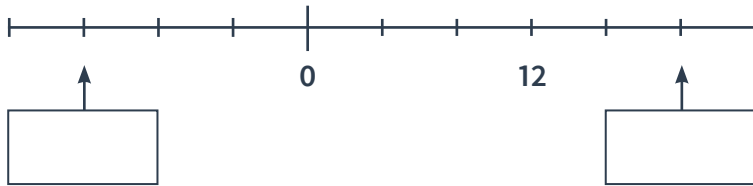
Q3 What is 686 minutes in hours and minutes?

$\boxed{}$ hours and $\boxed{}$ minutes

___
1 mark

Q1

Write in the missing digits.

223 × [**6**] 7 = 14,94 [**1**]

1 mark

Q2

Here is part of a number line.

Fill in the missing boxes.

[**−12**]   0   12   [**20**]

2 marks

Q3

What is 686 minutes in hours and minutes?

[**11**] hours and [**26**] minutes

1 mark

	Requirement	Mark	Additional guidance
Q1	**223 × 67 = 14,941**	1	
Q2	**−12, 20** Award **TWO** marks for the correct identification of both numbers. Award **ONE** mark for the correct identification of one number.	2	
Q3	**11 hours and 26 minutes**	1	

Q1 Two decimal numbers add together to make 2.5.

One number is 1.04.

What is the other number?

_____

1 mark

Q2 Three prime numbers multiply together to make 385.
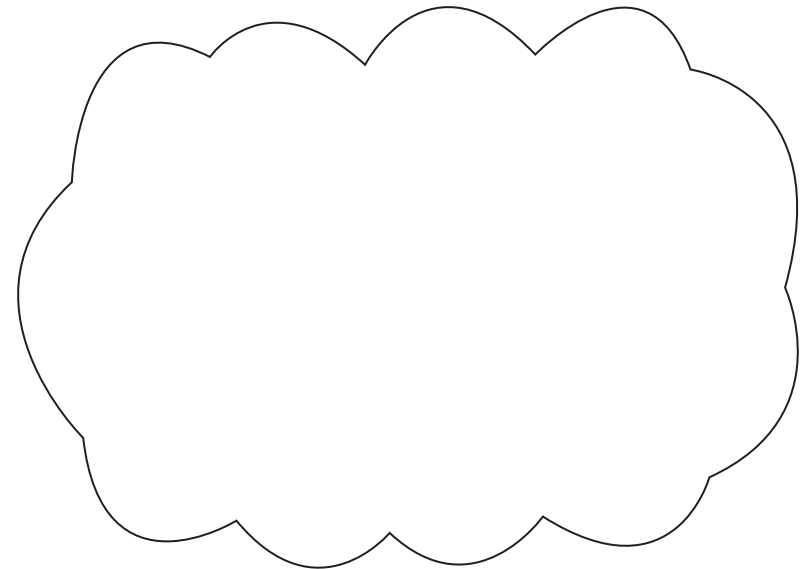
Complete the missing numbers.

☐ × ☐ × ☐ = 385

_____

1 mark

Q3 Lily says, "to convert any fraction to a decimal, you just divide the numerator by 10."

For example, $\frac{3}{10}$ = 0.3 as 3 ÷ 10 = 0.3.

Lily is not correct.

Explain why Lily is not correct.

_____

1 mark

Q1 Two decimal numbers add together to make 2.5.

One number is 1.04.

What is the other number?

1.46

_____
1 mark

Q2 Three prime numbers multiply together to make 385.

Complete the missing numbers.

$$\boxed{11} \times \boxed{5} \times \boxed{2} = 385$$

_____
1 mark

Q3 Lily says, "to convert any fraction to a decimal, you just divide the numerator by 10."

For example, $\frac{3}{10}$ = 0.3 as 3 ÷ 10 = 0.3.

Lily is not correct.

Explain why Lily is not correct.

See mark scheme for examples

_____
1 mark

	Requirement	Mark	Additional guidance
Q1	1.46	1	
Q2	11 × 5 × 2	1	Accept any permutations.
Q3	Award **ONE** mark for an explanation that indicates that dividing the numerator by 10 only works when the fraction is $\frac{?}{10}$ and that for other fractions it doesn't work, with an example provided. E.g. Dividing by 10 only works when the denominator is 10. It doesn't work for other fractions, like $\frac{1}{4}$ = 0.25, not 0.1 $\frac{1}{5}$ = 0.2 if Lily was correct $\frac{1}{5}$ = 0.1.	1	

Q1 Each coach from Raven Coaches seats 45 people.

Key Stage 2 at Bayview Primary is going on a trip.

There are 240 children in Key Stage 2. For every 10 children, one adult must go on the trip.

How many coaches does Bayview Primary need to book?

| coaches |

3 marks

Q2 Place these numbers in order, starting with the smallest.

499,999   98,483   564,854   578,843   564,843

_____

_____

1 mark

Q3 Two decimal numbers add together to make 3.05.

One number is 1.003.

What is the other number?

| |

1 mark

Q1 Each coach from Raven Coaches seats 45 people.

Key Stage 2 at Bayview Primary is going on a trip.

There are 240 children in Key Stage 2. For every 10 children, one adult must go on the trip.

How many coaches does Bayview Primary need to book?

6 coaches

3 marks

Q2 Place these numbers in order, starting with the smallest.

499,999   98,483   564,854   578,843   564,843

98,483   499,999   564,843

564,854   578,843

1 mark

Q3 Two decimal numbers add together to make 3.05.

One number is 1.003.

What is the other number?

2.047

1 mark

	Requirement	Mark	Additional guidance
Q1	Award **THREE** marks for the correct answer of 6 coaches. Award **TWO** marks for a complete method, with no more than two arithmetic answers **AND** which contain a whole number answer of coaches. Award **ONE** mark for an answer that includes a remainder, for example 5.6 coaches, 5 r39 coaches etc.	3	For the award of **TWO** marks the answer given must follow from the correct method when their arithmetic errors are taken into account. Also award **ONE** mark for an answer that has a remainder and which follows on from the correct method when up to two arithmetic errors are taken into account.
Q2	98,483 499,999 564,843 564,854 578,843	1	Do not accept reversals (i.e. numbers ordered biggest to smallest).
Q3	2.047	1	

What are examiners looking for?

Q1 **Each coach from Raven Coaches seats 45 people.**

Key Stage 2 at Bayview Primary is going on a trip.

There are 240 children in Key Stage 2. For every 10 children, one adult must go on the trip.

How many coaches does Bayview Primary need to book?

6 coaches

3 marks

Why are we asking this question?

This question is designed to assess children's ability to interpret the information from complex multi-step problems that involve calculations with more than one operation. It is also designed to assess children's ability to identify the most appropriate way, given the context of the problem, to deal with a remainder.

What common errors do we expect to see?

Children give the answer 5.86, 5 remainder 39 or similar. This indicates that children have not correctly identified how to deal with the remainder generated from the question within the context of the problem.

How to encourage children to solve this question

First, encourage children to read through the question, underlining or highlighting the key terms. They should have identified 'Each coach seats 45 people', '240 children' and 'for every 10 children, one adult' as the key information from this problem.

First, children should identify the total number of people that need to be accommodated on coaches, identifying that as there are 240 children, 24 adults must also go on the trip, making the total number of people who need space on a coach **264**.

Children should then carry out 264 ÷ 45, using an appropriate method for division which they are conformable with and of which they have a conceptual understanding.

Finally, they need to make a decision as to the remainder given the context of the problem. They should consider if it would be possible to order a 'part' coach, and therefore realise that they need to **round their answer up** (as rounding down would result in there being not enough seats on the coach), giving the final answer of **6**.
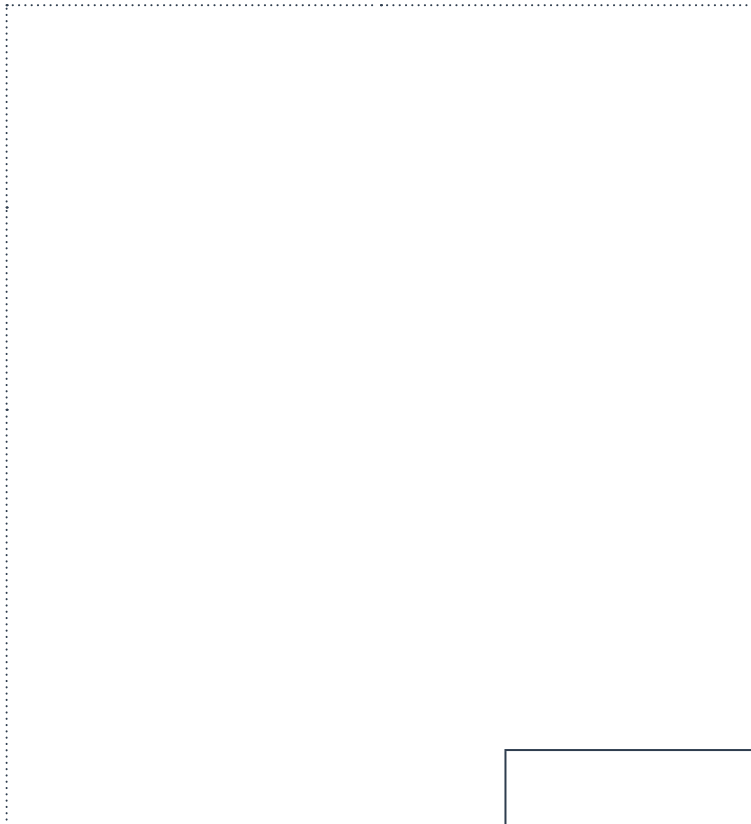
Q1 Leah and Gracie each buy a meal from a fast food restaurant.

Leah gets 5p change from £4.00.
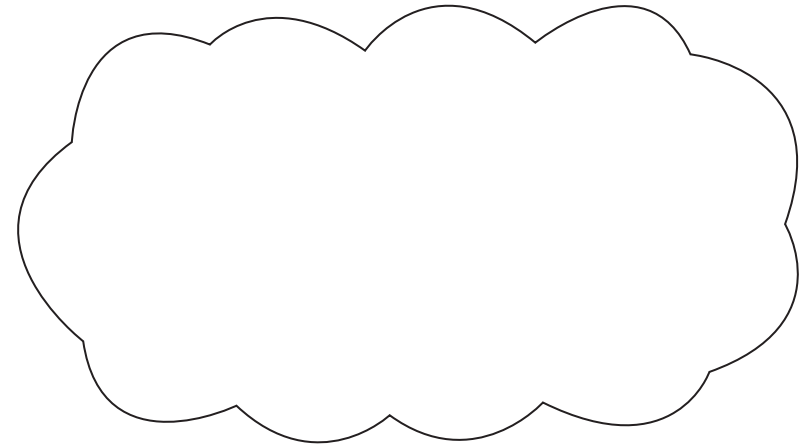
Gracie gets £6.25 change from £10.00.

How much more does Leah pay than Gracie?

2 marks

Q2 Rose knows that 86 × 4 = 344.

Explain how she can use this information to find the answer 186 × 4.

1 mark

Q3 Complete this table.

Number	Rounded to the nearest **whole** number
5.5	
6.49	
5.099	
3.94	

2 marks

Q1 Leah and Gracie each buy a meal from a fast food restaurant.

Leah gets 5p change from £4.00.

Gracie gets £6.25 change from £10.00.

How much more does Leah pay than Gracie?

20p

2 marks

Q2 Rose knows that 86 × 4 = 344.

Explain how she can use this information to find the answer 186 × 4.

See mark scheme for examples

1 mark

Q3 Complete this table.

Number	Rounded to the nearest **whole** number
5.5	6
6.49	6
5.099	5
3.94	4

2 marks

	Requirement	Mark	Additional guidance
Q1	Award **TWO** marks for the correct answer of £0.20 or 20p or £0.20p. Award **ONE** mark for either: an answer of 20, 0.20p or 0.20 **OR** a complete working with no more than one arithmetic error which is carried through to an answer, e.g. £4.00 – £0.05 = £3.95 £10.00 – £6.25 = £3.75 £3.95 – £3.75 = wrong answer.	2	For the award of **ONE** mark, the method must be complete and feasible and must clearly show that an answer has been arrived at, but this does not need to be recorded in the answer box.
Q2	Award **ONE** mark for an explanation which indicates that 400 can be added to 344, e.g. It's 4 × 100 more. You add another 400 on. 86 × 4 = 344. 4 × 100 = 400 so it's 744. 100 has been added to 86, so multiply 100 by 4 and add it to 344.	1	An answer to the multiplication is not required and no mark is awarded for it. However, if the multiplication has been attempted with an incorrect answer, this means **NO** mark can be awarded. Do **NOT** accept vague answers such as: • You work it out. • Do a calculation. • It's nearly the same except it has 100 in front of it.

	Requirement	Mark	Additional guidance
Q3	Award **TWO** marks if all boxes are completed correctly. 	2	Accept .0, .00 or .000 after the whole number answer (e.g. accept 6.00).

Number	Rounded to the nearest **whole** number
5.5	6
6.49	6
5.099	5
3.94	4

Award **ONE** mark for three boxes completed correctly.

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