THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

Rapid Reasoning

Year 4 | Week 5

This week, the new Year 4 objectives that are introduced continue to focus on **addition and subtraction** for the first time.

Year 4 objectives introduced in a reasoning context for the first time this week include:

- adding and subtracting numbers with up to four digits, including using the formal written methods for addition and subtraction where these are appropriate.

Objectives from *Fluent in Five* that are also tested in a reasoning context this week include:

- finding fractions of numbers, objects and sets
- calculations which include an increasing range of multiplication tables.

Please note that some questions are worth two marks, and by their very nature, answers to these questions are never clear-cut. For a full breakdown of how marks would be awarded for these questions, please refer to the mark schemes provided.

Q1 Mia is thinking of a number.

She adds 184 to her number.

She doubles it.

Her answer is 400.

What number was Mia thinking of?

2 marks

Q2 This is a blank multiplication grid.

×	1	2	3	4	5	6
1						
2						
3						
4						
5						

Tick all the boxes that would contain the number 12.

2 marks

Q3 Eden has read 45 pages of her book.

There are 191 pages in her book.

How many pages has she got left to read?

pages

1 mark

Q1 Mia is thinking of a number.

She adds 184 to her number.

She doubles it.

Her answer is 400.

What number was Mia thinking of?

16

2 marks

Q2 This is a blank multiplication grid.

×	1	2	3	4	5	6
1						
2						✓
3				✓		
4			✓			
5						

Tick all the boxes that would contain the number 12.

2 marks

Q3 Eden has read 45 pages of her book.

There are 191 pages in her book.

How many pages has she got left to read?

146 pages

1 mark

<table>
<tr><th></th><th>Requirement</th><th>Mark</th><th>Additional guidance</th></tr>
<tr><td>Q1</td><td>Award TWO marks for the correct answer of 16.

Award ONE mark for evidence of an appropriate method with no more than one arithmetic error, for example:

400 ÷ 2 = 200

200 − 184 = wrong answer.</td><td>2</td><td>Inverse operations must have been correctly identified for the award of ONE mark.</td></tr>
<tr><td>Q2</td><td>Award TWO marks for all three ticks correctly placed.

Award ONE mark for two ticks correctly placed.

<table>
<tr><th>×</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr>
<tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td>✓</td></tr>
<tr><td>3</td><td></td><td></td><td></td><td>✓</td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td><td>2</td><td></td></tr>
<tr><td>Q3</td><td>146</td><td>1</td><td></td></tr>
</table>

Q1 Fill in the missing digits in this calculation.

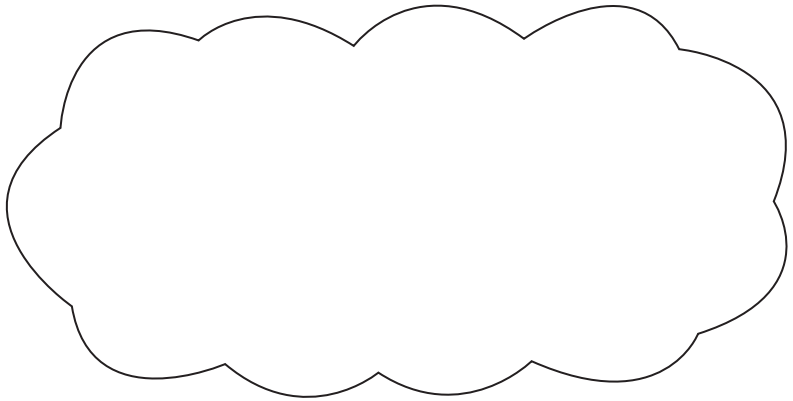
1	5		3
		3	1
	0	1	4

2 marks

Q2 Lily says, "Division is commutative."

Lily is incorrect.

Explain why Lily is incorrect — make sure you give an example.



1 mark

Q3 Put these temperatures in order, starting with the lowest.

18°C −12°C −19°C 3°C −2°C 1°C

lowest

1 mark

Q1 Fill in the missing digits in this calculation.

1	5	8	3
	4	3	1
2	0	1	4

2 marks

Q2 Lily says, "Division is commutative."

Lily is incorrect.

Explain why Lily is incorrect — make sure you give an example.

See mark scheme for examples

1 mark

Q3 Put these temperatures in order, starting with the lowest.

18°C −12°C −19°C 3°C −2°C 1°C

lowest

−19°C

−12°C

−2°C

1°C

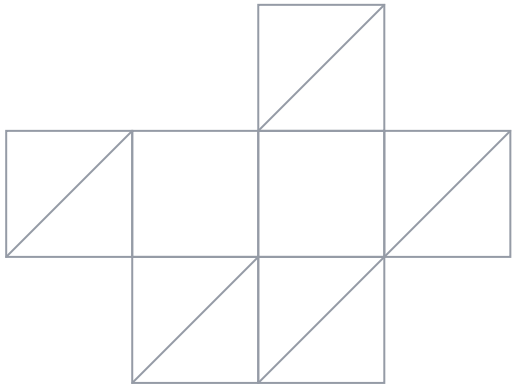
3°C

18°C

1 mark

	Requirement	Mark	Additional guidance
Q1	Award **TWO** marks for all three digits added correctly. 1 5 8 3 4 3 1 2 0 1 4 Award **ONE** mark for two digits added correctly.	2	
Q2	Award **ONE** mark for an explanation that explains that division cannot be done either way round and that gives an example, for example: "36 ÷ 6 is not the same as 6 ÷ 36."	1	Division statements do not need to be evaluated for the award of a mark.
Q3	−19°C −12°C −2°C 1°C 3°C 18°C	1	

Q1 Shade this shape so exactly $\frac{1}{2}$ is shaded.



1 mark

Q2 Toto is Mia's dog.

It costs Mia's family 43p a day for dog food.

How much does it cost Mia's family to feed Toto for a week?

£

1 mark

Q3 Mark thinks of a **whole** number.

He multiplies it by 4.

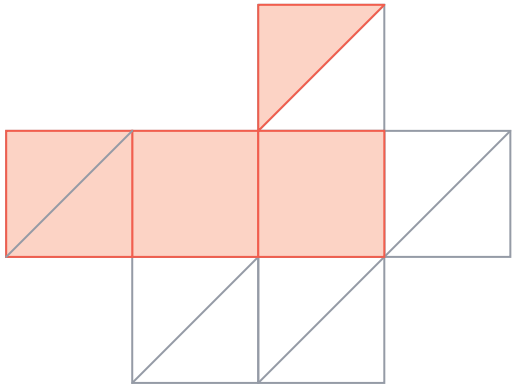
He rounds his answer to the nearest 10.

The result is 50.

Write **all** the possible numbers that Mark could have started with.

2 marks

Q1 Shade this shape so exactly $\frac{1}{2}$ is shaded.



1 mark

Q2 Toto is Mia's dog.

It costs Mia's family 43p a day for dog food.

How much does it cost Mia's family to feed Toto for a week?

£ 3.01

1 mark

Q3 Mark thinks of a **whole** number.

He multiplies it by 4.

He rounds his answer to the nearest 10.

The result is 50.

Write **all** the possible numbers that Mark could have started with.

12 and 13

2 marks

	Requirement	Mark	Additional guidance
Q1	Award mark for three and a half squares shaded.	1	
Q2	£3.01 OR £3.01p	1	Also accept 301p if the £ provided has been crossed out.
Q3	Award **TWO** marks for 12 and 13. Award **ONE** mark for: only one correct number and no incorrect number **OR** 12 AND 13 AND not more than one incorrect number **OR** 48 AND 52 AND no more than one incorrect number.	2	

Q1 Football stickers are sold in packs of 8.

Lily buys 9 packets.

She opens them, and realises she already has 7 of the stickers.

How many new stickers did Lily get from her 9 packets?

stickers

2 marks

Q2 This sequence **increases** by the same amount each time.

Fill in the missing numbers.

430 ☐ ☐ 775 ☐ 1,005

2 marks

Q3 Mia is thinking of a 4-digit number. The number has:

eight ones

half as many hundreds as ones

one more thousand than ones

no tens.

What is Mia's number?

1 mark

Q1 Football stickers are sold in packs of 8.

Lily buys 9 packets.

She opens them, and realises she already has 7 of the stickers.

How many new stickers did Lily get from her 9 packets?

65 stickers

2 marks

Q2 This sequence **increases** by the same amount each time.

Fill in the missing numbers.

430 | 545 | 660 | 775 | 890 | 1,005

2 marks

Q3 Mia is thinking of a 4-digit number. The number has:

eight ones

half as many hundreds as ones

one more thousand than ones

no tens.

What is Mia's number?

5401

1 mark

	Requirement	Mark	Additional guidance
Q1	Award **TWO** marks for the correct answer of 65 stickers. Award **ONE** mark for evidence of a complete method, for example: 8 × 9 = 72 56 − 7 = wrong answer.	2	Working must include evidence of child carrying out 8 × 9 for the award of **ONE** mark.
Q2	Award **TWO** marks for all three numbers completed correctly. 430 **545** **660** 775 **890** 1,005 Award **ONE** mark for two numbers completed correctly.	2	
Q3	5401	1	

What are examiners looking for?

Q2 **This sequence increases by the same amount each time.**

Fill in the missing numbers.

430 | 545 | 660 | 775 | 890 | 1,005

2 marks

Why are we asking this question?

This question is designed to test children's ability to identify the amount a sequence of numbers increases by each time, and to apply this to complete the sequence. The question purposefully does not provide any given numbers that are next to each other in the sequence.

What common errors do we expect to see?

Children complete the question using a step increase of 230 or 345. This indicates that children have just compared the values of two of the given numbers and have not accounted for the missing numbers in the sequence between the numbers in the question.

How to encourage children to solve this question

When faced with a question such as this, children should be first encouraged to consider the question 'What do I know already?'

They should identify that they know some numbers in the sequence, but that none of the given numbers are next to each other. They also know that the sequence increases by the same amount each time.

They should then identify which two sets of numbers they are going to use to help calculate the answer. In this question, most children will choose 775 and 1,005 as they identify that these are the closest together, as there is only one missing number between 775 and 1,005.

Children should then calculate the difference between the two given numbers, e.g. 1,005 − 775 = 230.

They should then consider how many steps there are between the two given numbers, identifying that there are two steps, 775 to the unknown number, and the unknown number to 1,005. As they know the difference is 230 and that the sequence increases by the same amount, they should identify that they need to divide 230 by 2 to find out the step size, which in this case is 115.

They can then apply this to the problem, completing the missing steps, and checking that the step size of 115 would take them throughout the sequence (e.g. when they have identified that the missing number before 775 is 660, they should check that 660 + 115 is 775).

Q1 Write the missing digits in the boxes below.

a 25 ÷ ☐ = 3 with 4 left over

1 mark

b 35 ÷ ☐ = 4 with 3 left over

1 mark

Q2 Every sheep at Whit Farm produces 36g of wool each time they are sheared.

They are sheared twice each year.

There are 9 sheep at Whit Farm.

How many grams of wool do all the sheep produce together **each year**?

☐ g

2 marks

Q3 Complete these sentences.

a There are ☐ days in a leap year.

1 mark

b There are ☐ seconds in three minutes.

1 mark

c There are ☐ days all together in March, April and May.

1 mark

Q1 Write the missing digits in the boxes below.

a 25 ÷ 7 = 3 with 4 left over

1 mark

b 35 ÷ 8 = 4 with 3 left over

1 mark

Q2 Every sheep at Whit Farm produces 36g of wool each time they are sheared.

They are sheared twice each year.

There are 9 sheep at Whit Farm.

How many grams of wool do all the sheep produce together **each year**?

648 g

2 marks

Q3 Complete these sentences.

a There are 366 days in a leap year.

1 mark

b There are 180 seconds in three minutes.

1 mark

c There are 92 days all together in March, April and May.

1 mark

	Requirement	Mark	Additional guidance
Q1a	7	1	
Q1b	8	1	
Q2	Award **TWO** marks for the correct answer of 648g. Award **ONE** mark for evidence of appropriate working, for example: 36 × 2 = 72 72 × 9 = wrong answer.	2	
Q3a	366	1	
Q3b	180	1	
Q3c	92	1	

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Rapid Reasoning

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- Boost confidence

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