THIRD SPACE
LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

Rapid Reasoning

Year 4 | Week 4

This is the last week in which the Year 4 objectives introduced this week continue to focus on **place value**, with children introduced to negative numbers for the first time.

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

- counting backwards through zero including using negative numbers.

The following Year 4 objectives continue to be a focus from week 3:

- rounding any number to the nearest 10, 100 or 1,000

- finding 10, 100 or 1000 more or less than a given number (children should be encouraged to use their knowledge of place value in order to do this)

- ordering and comparing numbers beyond 1,000

- recognising the place value of each digit in a four-digit number.

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

- written addition and subtraction which progresses beyond 1,000 for the first time

- solving missing number problems from multiplication and division (at Year 3 level).

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 Anne is thinking of a number.

She says, "When I divide the number by 8, my answer is 7."

What number is Anne thinking of?

_____
1 mark

Q2 **Fill in the missing digits in this calculation.**

6	7	5	3
1	6		1

	0	9	

_____
2 marks

Q3 This sequence decreases by five each time.

Fill in the missing numbers.

8   3   [ ]   −7   [ ]

_____
2 marks

Q1 Anne is thinking of a number.

She says, "When I divide the number by 8, my answer is 7."

What number is Anne thinking of?

> **56**

___
1 mark

Q2 Fill in the missing digits in this calculation.

6	7	5	3
1	6	**6**	1

5	0	9	**2**

___
2 marks

Q3 This sequence decreases by five each time.

Fill in the missing numbers.

8   3   **−2**   −7   **−12**

___
2 marks

	Requirement	Mark	Additional guidance
Q1	56	1	
Q2	Award **TWO** marks for all three digits added correctly. 6 7 5 3 1 6 6 1 5 0 9 2 Award **ONE** mark for two digits added correctly.	2	
Q3	Award ONE mark for each correctly completed box. 8 3 **−2** **−7** **−12**	2	

Q1 Mark is thinking of a number.

He says:

My number has 3 tens.

My number has 9 ones.

My number has twice as many hundreds as tens.

My number has one less thousand than it does tens.

What is Mark's number?

1 mark

Q2 $791 + 3 = ?$ $800 - 7 = ?$

$994 - 100 = ?$

$787 + 6 = ?$ $802 - 30 = ?$

Circle the two number sentences above that have the **same** answer.

1 mark

Q3 Look at these digits.

8   3   9   0   1

Write the biggest number you can make by re-arranging these digits. Give your answer in **words**.

1 mark

Q1 Mark is thinking of a number.

He says:

My number has 3 tens.

My number has 9 ones.

My number has twice as many hundreds as tens.

My number has one less thousand than it does tens.

What is Mark's number?

2639

1 mark

Q2 $791 + 3 = ?$ $800 - 7 = ?$

$994 - 100 = ?$

$787 + 6 = ?$ $802 - 30 = ?$

Circle the two number sentences above that have the **same** answer.

1 mark

Q3 Look at these digits.

8   3   9   0   1

Write the biggest number you can make by re-arranging these digits. Give your answer in **words**.

Ninety-eight thousand

three hundred and ten.

1 mark

	Requirement	Mark	Additional guidance
Q1	2639	1	
Q2	787 + 6 = ? 800 − 7 = ? circled.	1	Both must be circled for the award of the mark.
Q3	Ninety-eight thousand three hundred and ten.	1	Hyphens not needed for the award of the mark. Accept phonetically plausible spellings.

Q1 It is 185 miles on the train from York to London.

It is 105 miles on the train from London to Plymouth.

How many miles is it on the train from York to Plymouth?

miles

1 mark

Q2 The temperature in Moscow is −4°C

The temperature in London is 8°C warmer than Moscow.

What is the temperature in London?

°C

1 mark

Q3 Look at these times:

19:05 ☐ 12:30pm ☐ 9:05pm ☐ 13:00 ☐

Tick the time that is the **latest** in the day.

1 mark

Q1 It is 185 miles on the train from York to London.

It is 105 miles on the train from London to Plymouth.

How many miles is it on the train from York to Plymouth?

290	miles

1 mark

Q2 The temperature in Moscow is −4°C

The temperature in London is 8°C warmer than Moscow.

What is the temperature in London?

4	°C

1 mark

Q3 Look at these times:

19:05 ☐   12:30pm ☐   9:05pm ☑   13:00 ☐

Tick the time that is the **latest** in the day.

1 mark

	Requirement	Mark	Additional guidance
Q1	290 miles	1	
Q2	4°C	1	
Q3	9:05 pm ticked	1	

What are examiners looking for?

Q2 **The temperature in Moscow is −4°C**

The temperature in London is 8°C warmer than Moscow.

What is the temperature in London?

| **4** | **°C** |

1 mark

Why are we asking this question?

This question is designed to test children's understanding of negative numbers in the context of temperature. Negative numbers are introduced for the first time in Year 4 so this is new knowledge for the children.

What common errors do we expect to see?

Children give the answer 12°C
This indicates that children have treated −4 as 4, and therefore have not shown an understanding that it is a negative number.

Children give the answer −12°C
This indicates that children do not understand that negative numbers decrease in value as they move away from 0, and therefore that −12 is lower (i.e. colder) than −4.

## How to encourage children to solve this question

When faced with problems involving negative numbers, children should be encouraged to draw a 0-centred number line.

0

They can then label on arrows showing the direction of addition and subtraction if needed.

– +

0

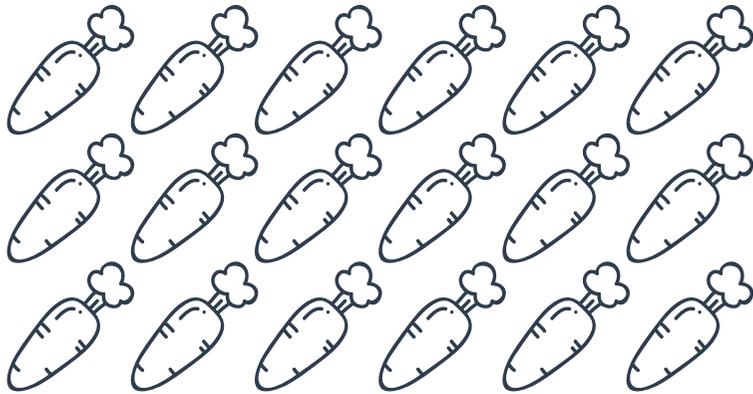They can then use this number line to calculate the answer to the problem, bridging through 0 as needed.

– +

−4 +4

0
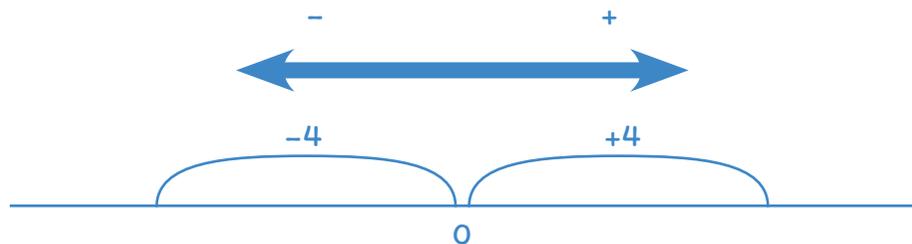
Q1 Mia has planted 16 carrots.

She picks $\frac{3}{4}$ of them.

How many carrots are left in the ground?

1 mark

Q2 Eggs are packed in packs of 6.

Larry has 3 chickens.

Each week, they lay 8 eggs **each**.

How many full packs of eggs can Larry make each week?

packs

2 marks

Q3

a Match the calculation to its answer.

568 + 24 =   596

                          598

683 − 87 =   609

768 − 159 =   592

1 mark

b Can you write a calculation that involves the number 409 for the answer that doesn't have a question joined to it?

_____

_____

_____

1 mark

Q1 Mia has planted 16 carrots.

She picks $\frac{3}{4}$ of them.
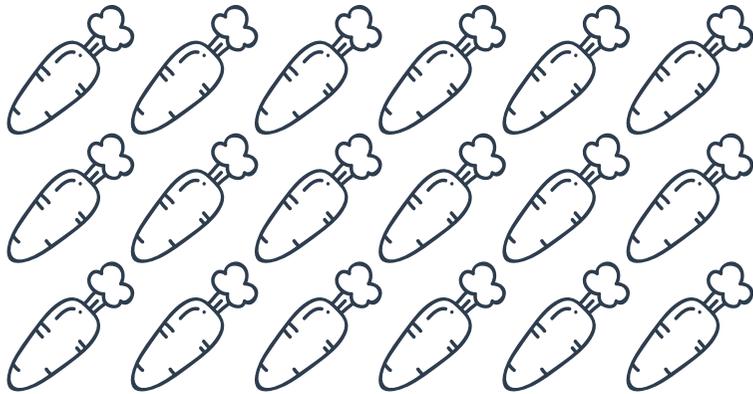
How many carrots are **left** in the ground?

4

1 mark

Q2 Eggs are packed in packs of 6.

Larry has 3 chickens.

Each week, they lay 8 eggs **each**.

How many full packs of eggs can Larry make each week?

4	packs

2 marks

Q3

a   Match the calculation to its answer.

$568 + 24 =$ 596

                               598

$683 - 87 =$ 609

$768 - 159 =$ 592

1 mark

b   Can you write a calculation that involves the number 409 for the answer that doesn't have a question joined to it?

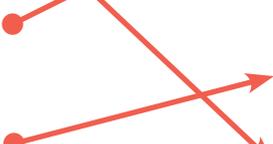*See mark scheme*

for examples

1 mark

	Requirement	Mark	Additional guidance
Q1	4	1	
Q2	Award **TWO** marks for the correct answer of four packs. Award **ONE** mark for evidence of a complete working, but with one arithmetic error, for example: 3 × 8 = 24 24 ÷ 6 = wrong answer.	2	
Q3a	568 + 24 = 596 598 683 − 87 = 609 768 − 159 = 592	1	
Q3b	Any correct calculation that has the answer 598 **and** involves the number 409.	1	If part a is incorrect, award the mark for part b if they write a correct calculation involving the number 409 which has the answer of the number not matched in part a.

Q1 Eden has £2.50

She spends 65p on a drink.

She also spends £1.05 on a magazine.

How much money does she have left?

£

2 marks

Q2 This sequence decreases by the same amount each time.

Fill in the missing numbers.
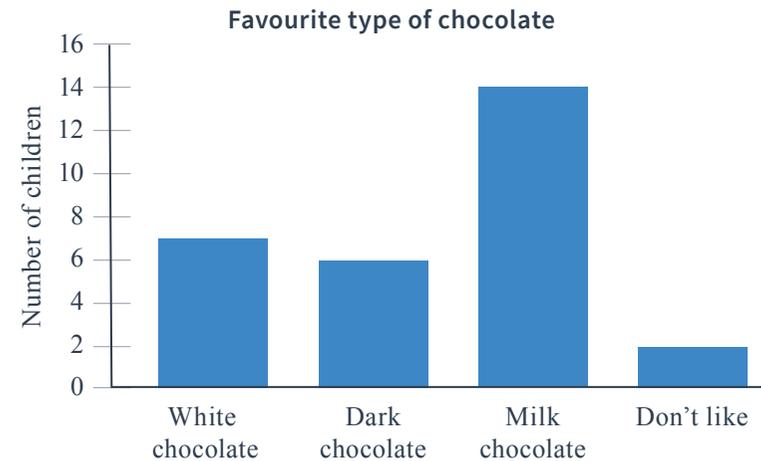
[ ] 1 [ ] −5 [ ]

2 marks

Q3 Lily asked some children what their favourite type of chocolate was. She drew a bar chart of her results.

Favourite type of chocolate

a How many **more** children like Milk Chocolate than White Chocolate?

1 mark

b How many children did Lily ask altogether?

1 mark

Q1 Eden has £2.50

She spends 65p on a drink.

She also spends £1.05 on a magazine.

How much money does she have left?

£ **0.80**

2 marks

Q2 This sequence decreases by the same amount each time.
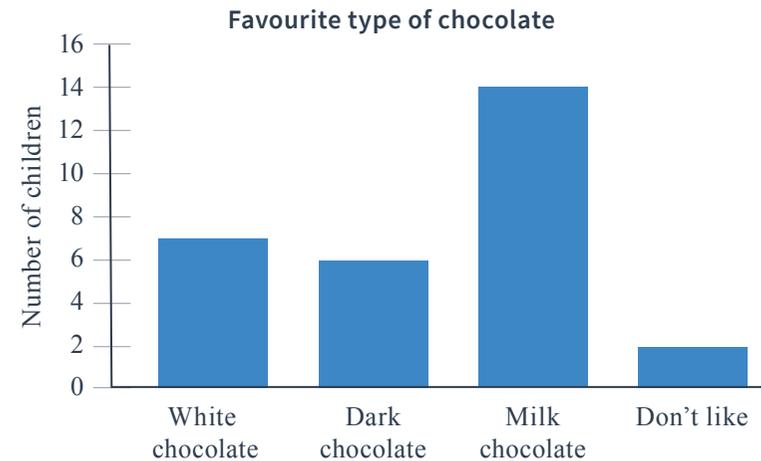
Fill in the missing numbers.

| **4** | 1 | **−2** | −5 | **−8** |

2 marks

Q3 Lily asked some children what their favourite type of chocolate was. She drew a bar chart of her results.

Favourite type of chocolate

a **How many more children like Milk Chocolate than White Chocolate?**

7

1 mark

b **How many children did Lily ask altogether?**

29

1 mark

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	Requirement	Mark	Additional guidance
Q1	Award **TWO** marks for the correct answer of £0.80 (also accept £0.80p). Award **ONE** mark for an answer of £80 or £80p **OR** for evidence of a complete method with one arithmetic error.	2	Also accept 80p if the £ symbol provided has been crossed out.
Q2	**TWO** marks for all three boxes completed correctly. **4** **1** **−2** **−5** **−8** Award **ONE** mark for two boxes completed correctly.	2	
Q3a	7	1	
Q3b	29	1	

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