THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

Rapid Reasoning

Year 3 | Weeks 25–36

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Rapid Reasoning

Year 3 | Week 34

This week, the questions within *Rapid Reasoning* continue to focus on measurement.

The following Year 3 objectives, first introduced in week 33, continues to be a focus:

- measuring, comparing, adding and subtracting: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
- comparing and calculating with lengths, mass, volume and capacity.

As with previous weeks, other content from Year 3, which the children have met in previous weeks of *Rapid Reasoning* will also feature this week.

Q1 India has 7 football stickers.

Kian says, "I have 5 times as many football stickers as India."

Jermaine says, "I have twice as many football stickers as Kian."

How many stickers do Kian and Jermaine have **altogether**?

stickers

2 marks

Q2 Fran has two bottles of water.

She says, "Bottle A contains $1\frac{1}{2}$ litres and Bottle B contains 2 litres. I am now going to pour out the same amount from both bottles."

Kian says, "I know which bottle will be left with the least water in it without even looking at them. I even know by how much."

Is Kian correct? **YES** / **NO**

Explain your answer.

1 mark

Q3

a 9 more than a number equals 304.

What is the number?

1 mark

b 50 less than a number equals 782.

What is the number?

1 mark

Q1 India has 7 football stickers.

Kian says, "I have 5 times as many football stickers as India."

Jermaine says, "I have twice as many football stickers as Kian."

How many stickers do Kian and Jermaine have **altogether**?

105 stickers

2 marks

Q2 Fran has two bottles of water.

She says, "Bottle A contains $1\frac{1}{2}$ litres and Bottle B contains 2 litres. I am now going to pour out the same amount from both bottles."

Kian says, "I know which bottle will be left with the least water in it without even looking at them. I even know by how much."

Is Kian correct? **YES** / **NO**

Explain your answer.

See mark scheme for example

1 mark

Q3

a 9 more than a number equals 304.

What is the number?

295

1 mark

b 50 less than a number equals 782.

What is the number?

832

1 mark

	Requirement	Mark	Additional guidance
Q1	105 stickers Award **TWO** marks for a correct answer. Award **ONE** mark for a correct method with one arithmetic error.	2	
Q2	Yes Kian is correct because if the same amount has been subtracted from both volumes, the least amount of water will be the one that contained less to begin with (Container A). The difference will still be $\frac{1}{2}$l (or 500ml), even though the numbers will have changed. Award **ONE** mark for any appropriate explanation **as well as** the indication that Kian is correct.	1	
Q3a	295	1	
Q3b	832	1	

Q1 Sam's dad goes for a bike ride every day.

On Day 2, he cycles 19km.

Over all 4 days, he cycles 70km altogether.

How many kilometres could Sam's dad cycle on the other days?

Day 1 = ☐ km

Day 2 = 19km

Day 3 = ☐ km

Day 4 = ☐ km

1 mark

Q2 The price of a T-shirt is £10.

The price of a pair of shorts is £6.

Tilley's mum buys some T-shirts and shorts.

She spends £62.

How many T-shirts and shorts could Tilley's mum have bought?

Give **TWO** possible answers.

☐ T-shirts and ☐ pairs of shorts

OR

☐ T-shirts and ☐ pairs of shorts

2 marks

Q3 A radio DJ has 1 hour and 5 minutes left of her show.

She needs to choose some interesting content to fill the time.

Tick the activities she could use to fill the last 1 hour and 5 minutes exactly.

Activity	Duration	
Play the latest songs	25 min	☐
News and weather	20 min	☐
Celebrity interview	15 min	☐
Birthday requests	10 min	☐
Mystery voice quiz	10 min	☐
Sports update	5 min	☐
Song of the day	5 min	☐

1 mark

Q1 Sam's dad goes for a bike ride every day.

On Day 2, he cycles 19km.

Over all 4 days, he cycles 70km altogether.

How many kilometres could Sam's dad cycle on the other days?

Day 1 = 11 km

Day 2 = 19km

Day 3 = 18 km

Day 4 = 12 km

1 mark

Q2 The price of a T-shirt is £10.

The price of a pair of shorts is £6.

Tilley's mum buys some T-shirts and shorts.

She spends £62.

How many T-shirts and shorts could Tilley's mum have bought?

Give **TWO** possible answers.

5 T-shirts and 2 pairs of shorts

OR

2 T-shirts and 7 pairs of shorts

2 marks

Q3 A radio DJ has 1 hour and 5 minutes left of her show.

She needs to choose some interesting content to fill the time.

Tick the activities she could use to fill the last 1 hour and 5 minutes exactly.

Activity	Duration	
Play the latest songs	25 min	✓
News and weather	20 min	✓
Celebrity interview	15 min	✓
Birthday requests	10 min	
Mystery voice quiz	10 min	
Sports update	5 min	✓
Song of the day	5 min	

1 mark

	Requirement	Mark	Additional guidance
Q1	Accept any three completed numbers that equal 51 (so that the overall total is 70km).	1	
Q2	**5** T-shirts and **2** pairs of shorts **2** T-shirts and **7** pairs of shorts Award **ONE** mark for each combination.	2	
Q3	Award **ONE** mark for any combination of activities that **totals 65 minutes.** For example: Play the latest songs (25 min) News and weather (20 min) Celebrity interview (15 min) Sports update (5 min) = 65 minutes	1	

Q1 This table shows the number of employees that four different companies have.

Company name	Number of employees
Chedbury's Cheeses Ltd	642
Parson's Pickles Ltd	426
Bob's Biscuits Ltd	624
Rapley's Relishes Ltd	462

Compare the number of employees that each company has.

Write the symbols =, < or > so that each statement is correct.

Parson's Pickles ◯ Chedbury's Cheeses

Rapley's Relishes ◯ Parson's Pickles

Bob's Biscuits ◯ Chedbury's Cheeses

2 marks

Q2 Hatham says, "5 − 2 equals 3.

And 10 − 10 equals 0.

So, $\frac{5}{10} - \frac{2}{10}$ equals $\frac{3}{0}$."

Is Hatham right? **YES / NO**

Explain your answer.

1 mark

Q3 Choose the words **always, sometimes** or **never.**

A mass measured in grams will _____ be lighter than a mass measured in kilograms.

Half a kilogram is _____ equal to 50g.

If the numbers are exactly the same but the units are different, a mass measured in grams will _____ be lighter than a mass measured in kilograms.

2 marks

Q1 This table shows the number of employees that four different companies have.

Company name	Number of employees
Chedbury's Cheeses Ltd	642
Parson's Pickles Ltd	426
Bob's Biscuits Ltd	624
Rapley's Relishes Ltd	462

Compare the number of employees that each company has.

Write the symbols =, < or > so that each statement is correct.

Parson's Pickles **<** Chedbury's Cheeses

Rapley's Relishes **>** Parson's Pickles

Bob's Biscuits **<** Chedbury's Cheeses

2 marks

Q2 Hatham says, "5 − 2 equals 3.

And 10 − 10 equals 0.

So, $\frac{5}{10} - \frac{2}{10}$ equals $\frac{3}{0}$."

Is Hatham right? **YES** / **NO**

Explain your answer.

See mark scheme for example

1 mark

Q3 Choose the words **always, sometimes** or **never.**

A mass measured in grams will **sometimes** be lighter than a mass measured in kilograms.

Half a kilogram is **never** equal to 50g.

If the numbers are exactly the same but the units are different, a mass measured in grams will **always** be lighter than a mass measured in kilograms.

2 marks

	Requirement	Mark	Additional guidance
Q1	<, >, < Award **TWO** marks for all three correct symbols. Award **ONE** mark for any two correct symbols.	2	
Q2	No. Hatham is not correct because the denominators should not be subtracted. The answer should be $\frac{3}{10}$, not $\frac{3}{0}$. Award ONE mark for any other appropriate explanation **as well as** the recognition that Hatham is not correct.	1	
Q3	sometimes, never, always Award **TWO** marks for all three correct answers. Award **ONE** mark for any two correct answers.	2	

Q1 This table shows the volumes of water in four buckets.

Bowl	Volume
A	5l 200ml
B	500ml
C	$5\frac{1}{2}$ l
D	5l

Compare the volumes of water with the symbols >, < or =.

Volume A ◯ Volume C

Volume D ◯ Volume B

Volume B ◯ Volume A

2 marks

Q2 Joanne's mum is driving from Northbury to High Kington

Her journey takes 98 minutes in total.

How long does the journey take in hours and minutes?

☐ hours ☐ minutes

1 mark

Q3 Write a ✓ or ✗ to show whether each comparison is true or false.

$\frac{1}{9} > \frac{1}{7}$ ☐

$\frac{2}{4} < \frac{3}{4}$ ☐

$\frac{1}{2}$ is equal to $\frac{2}{4}$ ☐

$\frac{4}{5} < \frac{3}{5}$ ☐

2 marks

Q1 This table shows the volumes of water in four buckets.

Bowl	Volume
A	5l 200ml
B	500ml
C	$5\frac{1}{2}$ l
D	5l

Compare the volumes of water with the symbols >, < or =.

Volume A < Volume C

Volume D > Volume B

Volume B < Volume A

2 marks

Q2 Joanne's mum is driving from Northbury to High Kington

Her journey takes 98 minutes in total.

How long does the journey take in hours and minutes?

3 hours 18 minutes

1 mark

Q3 Write a ✓ or ✗ to show whether each comparison is true or false.

$\frac{1}{9} > \frac{1}{7}$ ✗

$\frac{2}{4} < \frac{3}{4}$ ✓

$\frac{1}{2}$ is equal to $\frac{2}{4}$ ✓

$\frac{4}{5} < \frac{3}{5}$ ✗

2 marks

	Requirement	Mark	Additional guidance
Q1	<, >, < Award **TWO** marks for all three correct symbols. Award **ONE** mark for any two correct symbols.	2	
Q2	3 hours 18 minutes	1	
Q3	FALSE, TRUE, TRUE, FALSE Award **TWO** marks for all four correct answers. Award **ONE** mark for any two or three correct answers.	2	

Q1

ALL ITEMS HIRED FOR 1 HOUR.

Adult bike	£18
Child bike	£12
Adult safety helmet	£9 and 40p
Child safety helmet	£6 and 40p

Alicia is going cycling around the park.

She wants to hire a child's bike and a child's safety helmet.

She has a £20 note to pay with.

How much change will Alicia be given?

2 marks

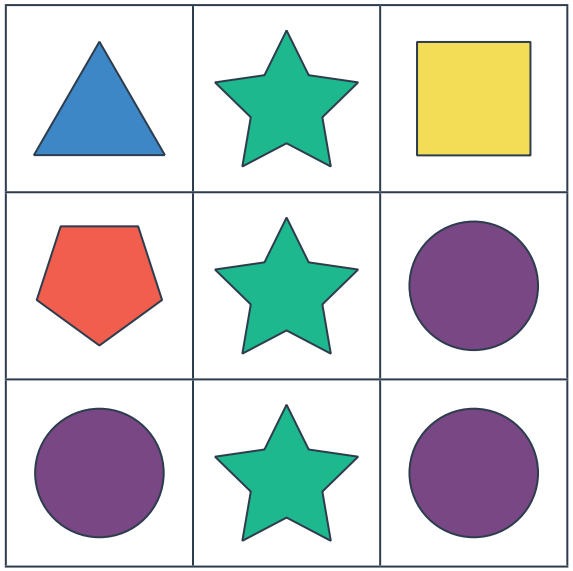
Q2

Tick the correct column of the table to show whether each pair of lines is perpendicular, parallel or neither.

Lines	Perpendicular	Parallel	Neither
Two railway tracks			
The two lines that make the capital letter V			
The angle where a wall meets the ground			
The two lines that make the capital letter L			

1 mark

Q3 Each shape in this puzzle is worth a different number.



20

?

20

12 24 19

What is each shape worth? Complete the values.

 = ☐

 = ☐

 = ☐

 = ☐

 = ☐

2 marks

Q1

ALL ITEMS HIRED FOR 1 HOUR.

Adult bike	£18
Child bike	£12
Adult safety helmet	£9 and 40p
Child safety helmet	£6 and 40p

Alicia is going cycling around the park.

She wants to hire a child's bike and a child's safety helmet.

She has a £20 note to pay with.

How much change will Alicia be given?

£1.60

2 marks

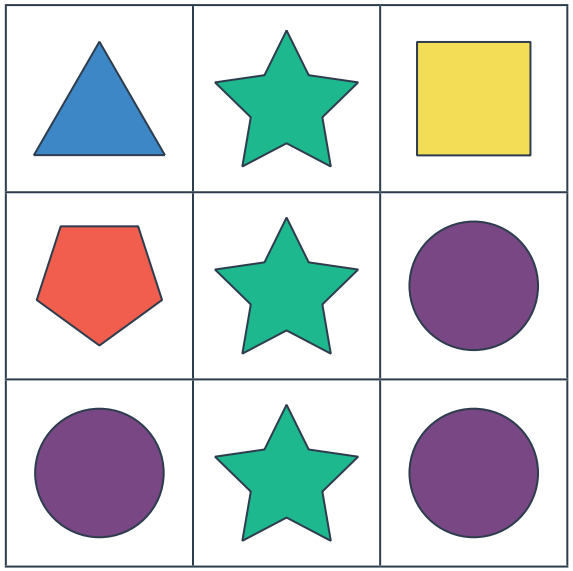
Q2

Tick the correct column of the table to show whether each pair of lines is perpendicular, parallel or neither.

Lines	Perpendicular	Parallel	Neither
Two railway tracks		✓	
The two lines that make the capital letter V			✓
The angle where a wall meets the ground	✓		
The two lines that make the capital letter L	✓		

1 mark

Q3 Each shape in this puzzle is worth a different number.



20

?

20

12 24 19

What is each shape worth? Complete the values.

 = 1

 = 7

 = 8

 = 6

 = 5

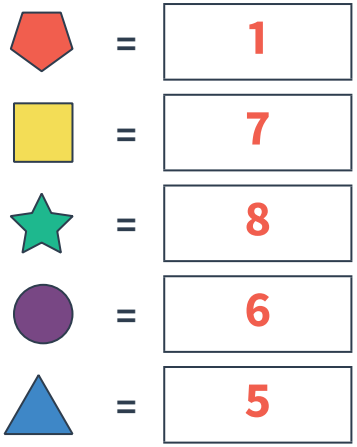
2 marks

<table>
<tr><th></th><th>Requirement</th><th>Mark</th><th>Additional guidance</th></tr>
<tr><td>Q1</td><td>£1 and 60p

Award TWO marks for a correct answer.

Award ONE mark for a correct method, but with one arithmetic error.</td><td>2</td><td></td></tr>
<tr><td>Q2</td><td>
<table>
<tr><th>Lines</th><th>Perpendicular</th><th>Parallel</th><th>Neither</th></tr>
<tr><td>Two railway tracks</td><td></td><td>✓</td><td></td></tr>
<tr><td>The two lines that make the capital letter V</td><td></td><td></td><td>✓</td></tr>
<tr><td>The angle where a wall meets the ground</td><td>✓</td><td></td><td></td></tr>
<tr><td>The two lines that make the capital letter L</td><td>✓</td><td></td><td></td></tr>
</table>

Award TWO marks for all four correct answers.

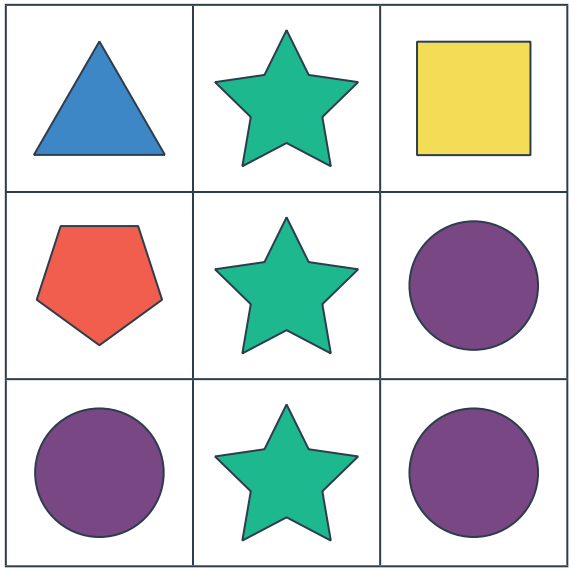
Award ONE mark for any two or three correct answers.</td><td>1</td><td></td></tr>
<tr><td>Q3</td><td> 

Award TWO marks for all five correct values.

Award ONE mark for any three or four correct values.</td><td>2</td><td></td></tr>
</table>

What are examiners looking for?

Q3 Each shape in this puzzle is worth a different number.



20

?

20

12 24 19

What is each shape worth? Complete the values.

 = 1

 = 7

 = 8

 = 6

 = 5

2 marks

Why are we asking this question?

This question is designed to assess children's ability to solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

What common errors do we expect to see?

Some children may presume that they need to solve each shape's value in the order they are written. They will find this difficult as the only shape they can solve to start with is the star.

Some children may see the 3 stars in a row and the total of 24, but not make the link to division. For example, they may work out 24 − 3 and give a value of 21.

How to encourage children to solve this question

Begin by providing children with strips of blank paper and encourage them to cover up the grid so that they only look at one row or column in turn. As they focus on each individual set of three symbols, they should be encouraged to ask themselves, "Do I have enough information to work out what these symbols are worth?" This should help children to recognise that the only symbol they can work out to begin with is the star.

Encourage children to annotate the grid as they discover more and more values. They can write out number sentences to further embed the calculation that needs to be done. For example, once they know that a triangle is worth 5 and a circle is worth 6, they can represent the left-hand column as 5 + ? + 6 = 12 and can deduce the missing value from this number sentence.

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