THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

# Rapid Reasoning

## Year 5 | Weeks 19-24

THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

# Rapid Reasoning

## Year 5 | Week 21

As with last week, the questions this week within *Rapid Reasoning* continue to focus on fractions and proportionality.

This week, the following objectives, which relate to percentages and decimals, are introduced for the first time:

- read, write, order and compare numbers with up to three decimal places
- recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
- solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$, and those fractions with a denominator of a multiple of 10 or 25.

As with previous weeks, other content from Year 5 that the children have met in previous weeks of *Rapid Reasoning*, along with Year 4 objectives, will also feature this week.

## Q1

Abby and Krishna both have hundred squares.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

Abby puts plastic counters on all of the squares that are multiples of 6.

Krishna puts plastic counters on all of the squares that contain a 9 digit.

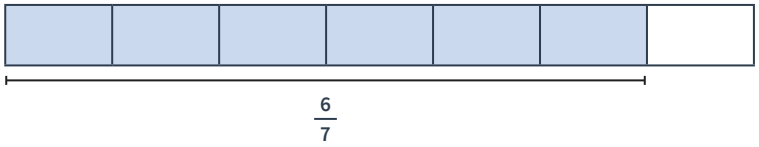
What part of both children's hundred squares are covered? Write your answers as fractions and as decimals in this table.

| | Part covered (as a fraction) | Part covered (as a decimal) |
|---|---|---|
| **Abby** | | |
| **Krishna** | | |

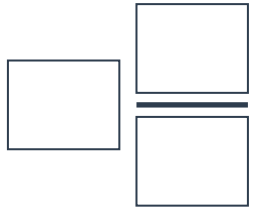
2 marks

## Q2

This bar model shows $\frac{6}{7}$.




What is double this amount? Write your answer as a mixed number.



1 mark

**Q3** Complete the table to show equivalent fractions, decimals and percentages.

| Fraction | Decimal | Percentage |
|---|---|---|
| $\frac{1}{2}$ | 0.5 | 50% |
| $\frac{1}{5}$ | | |
| | | 40% |

2 marks

## Q1

Abby and Krishna both have hundred squares.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

Abby puts plastic counters on all of the squares that are multiples of 6.

Krishna puts plastic counters on all of the squares that contain a 9 digit.

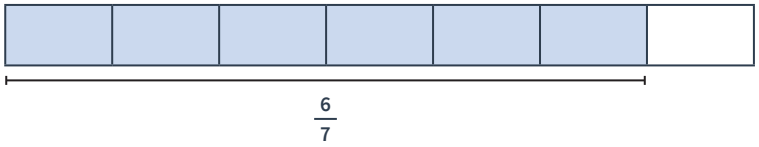
What part of both children's hundred squares are covered? Write your answers as fractions and as decimals in this table.

| | Part covered (as a fraction) | Part covered (as a decimal) |
|---|---|---|
| **Abby** | $\frac{16}{100}$ | 0.16 |
| **Krishna** | $\frac{19}{100}$ | 0.19 |

2 marks

## Q2

This bar model shows $\frac{6}{7}$.




What is double this amount? Write your answer as a mixed number.

$$1\frac{5}{7}$$

1 mark

**Q3** Complete the table to show equivalent fractions, decimals and percentages.

| Fraction | Decimal | Percentage |
|---|---|---|
| $\frac{1}{2}$ | 0.5 | 50% |
| $\frac{1}{5}$ | 0.2 | 20% |
| $\frac{4}{10}$ | 0.4 | 40% |

2 marks

| | Requirement | Mark | Additional guidance |
|---|---|---|---|
| Q1 | Abby = $\frac{16}{100}$, 0.16<br>Krishna = $\frac{19}{100}$, 0.19<br>Award TWO marks for all four boxes completed correctly.<br>Award ONE mark for two or three boxes completed correctly. | 2 | |
| Q2 | $1\frac{5}{7}$ | 1 | |
| Q3 | 0.2, 20%<br>$\frac{4}{10}$ (or $\frac{2}{5}$), 0.4<br>Award TWO marks for all four correct values.<br>Award ONE mark for two or three correct values. | 2 | |

**Q1** A school staff room has a large bag of doughnuts on the table.

Just before breaktime, the Year 5 teacher sneaks in to take $\frac{3}{16}$ of the doughnuts for her class.

At lunch, the Year 6 teacher takes $\frac{5}{8}$ of the original bag of doughnuts for his class.

What fraction of the whole bag of doughnuts is **left**?

$\frac{\square}{\square}$

1 mark

**Q2**

| 2 | 9 | 11 | 6 |
|---|---|---|---|

Use these number cards to make two fractions that are greater than 1 whole. Write both fractions as improper fractions and mixed numbers.

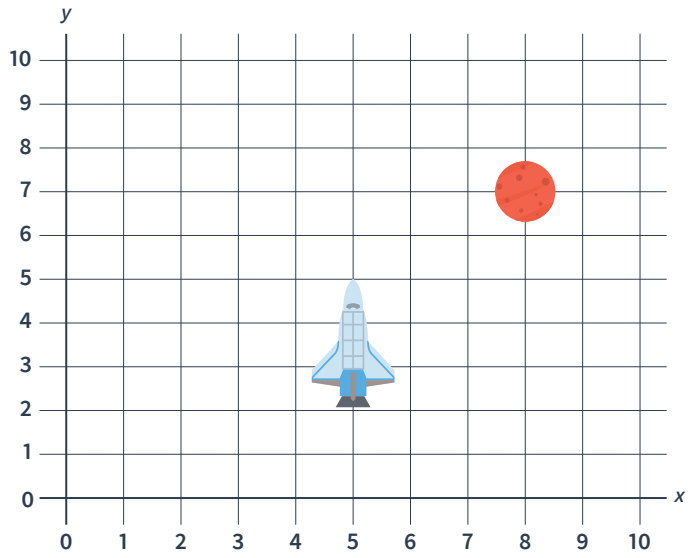
A)

B)

2 marks

**Q3** A spaceship is at grid position (5,5).

The planet Zerton is at grid position (8,7).




**a** The spaceship moves 5 to the left and 2 down.

What are the co-ordinates of its new position?

( ☐ , ☐ )

1 mark

**b** Describe how the spaceship can move from its new position to the planet.

Complete the missing numbers and cross out any directions you do not need.

The spaceship should move ☐ to the **LEFT** / **RIGHT** and ☐ **UP** / **DOWN**.

1 mark

**Q1** A school staff room has a large bag of doughnuts on the table.

Just before breaktime, the Year 5 teacher sneaks in to take $\frac{3}{16}$ of the doughnuts for her class.

At lunch, the Year 6 teacher takes $\frac{5}{8}$ of the original bag of doughnuts for his class.

What fraction of the whole bag of doughnuts is **left**?

$\frac{3}{16}$

1 mark

**Q2**

| 2 | 9 | 11 | 6 |
|---|---|---|---|

Use these number cards to make two fractions that are greater than 1 whole. Write both fractions as improper fractions and mixed numbers.

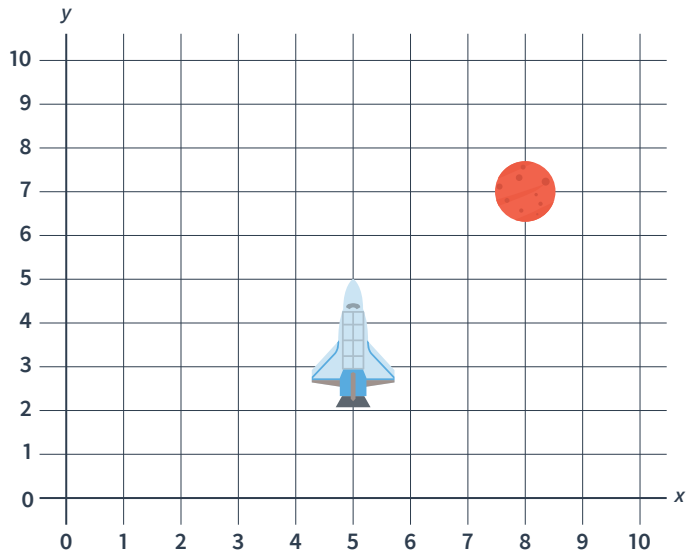
A) $\frac{9}{2} = 4\frac{1}{2}$

B) $\frac{11}{6} = 1\frac{5}{6}$

2 marks

**Q3** A spaceship is at grid position (5,5).

The planet Zerton is at grid position (8,7).




**a** The spaceship moves 5 to the left and 2 down.

What are the co-ordinates of its new position?

( 0 , 3 )

1 mark

**b** Describe how the spaceship can move from its new position to the planet.

Complete the missing numbers and cross out any directions you do not need.

The spaceship should move 8 to the **LEFT** / ~~**RIGHT**~~ and 4 **UP** / ~~**DOWN**~~.

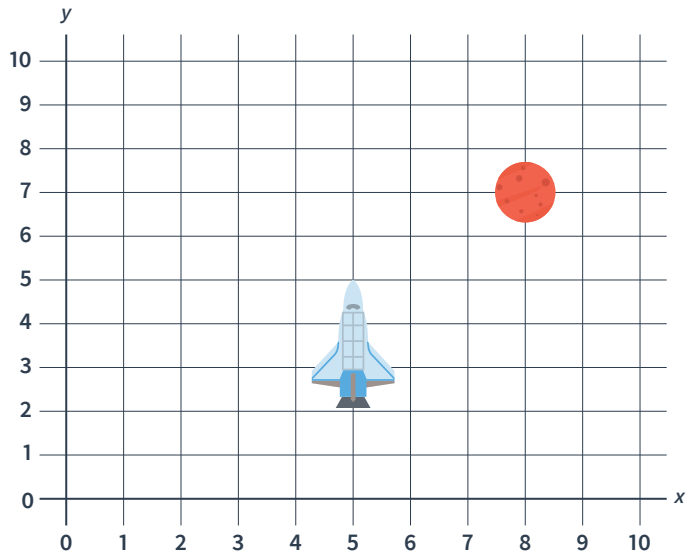
1 mark

| | Requirement | Mark | Additional guidance |
|---|---|---|---|
| Q1 | $\frac{3}{16}$<br>Award TWO marks for a correct answer. | 1 | |
| Q2 | Accept any of the following:<br>$\frac{9}{2} = 4\frac{1}{2}$ and $\frac{11}{6} = 1\frac{5}{6}$<br>OR<br>$\frac{11}{2} = 5\frac{1}{2}$ and $\frac{6}{6} = 1\frac{3}{6}$ (or $1\frac{1}{2}$)<br>OR<br>$\frac{6}{2} = 3$ and $\frac{11}{9} = 1\frac{2}{9}$.<br>Award ONE mark for each improper fraction converted correctly into a mixed number. | 2 | |
| Q3a | (0,3) | 1 | |
| Q3b | The spaceship should move **8** squares to the **right** and **4** squares **up.** | 1 | |

## What are examiners looking for?

**Q3** A spaceship is at grid position (5,5).

The planet Zerton is at grid position (8,7).




**a** The spaceship moves 5 to the left and 2 down.

What are the co-ordinates of its new position?

( 0 , 3 )

1 mark

**b** Describe how the spaceship can move from its new position to the planet.

Complete the missing numbers and cross out any directions you do not need.

The spaceship should move 8 to the ~~LEFT~~ / RIGHT and 4 ~~UP~~ / DOWN.

1 mark

## Why are we asking this question?

This question is designed to assess children's ability to describe positions in the first quadrant as coordinate pairs (Part A) and also to describe the position of a shape following a translation (Part B).

## What common errors do we expect to see?

Some children may identify the *x*- and *y*-coordinates incorrectly, recording their answer as (3,0) instead of (0,3).

Some children may confuse left and right. This will affect their answers to both parts of the question. Children who make this mistake will give incorrect answers of (10,3) for Part A and 2 squares to the right and 4 squares up for Part B.

## How to encourage children to solve this question

Encourage children to apply any aide-memoire they are familiar with to remind them of how to use *x*- and *y*-coordinates. For example, “across the hall and up the stairs” to help remember that the *x*-coordinate (across) comes before the *y*-coordinate (up).

Children may benefit from using a plastic counter or similar and physically moving it around the grid to mimic the movements described in the question. Encourage children to count aloud as they travel around the quadrant.

**Q1** At a restaurant, the free refill machine only dispenses $\frac{2}{3}$ of a glass of cola at a time.

Daniel thinks the machine is broken, so he presses the button 6 times in a row.

How many glasses of cola will Daniel fill?

_____ glasses

1 mark

**Q2** Three of these calculations equal the same amount.

A) $\frac{7}{10} - \frac{1}{5}$

B) $\frac{9}{20} + \frac{1}{10}$

C) $\frac{3}{5} - \frac{1}{10}$

D) $\frac{10}{40} + \frac{10}{40}$

Find the odd calculation out and write the answer.

The odd one out is _____. The answer is $\frac{\square}{\square}$.

1 mark

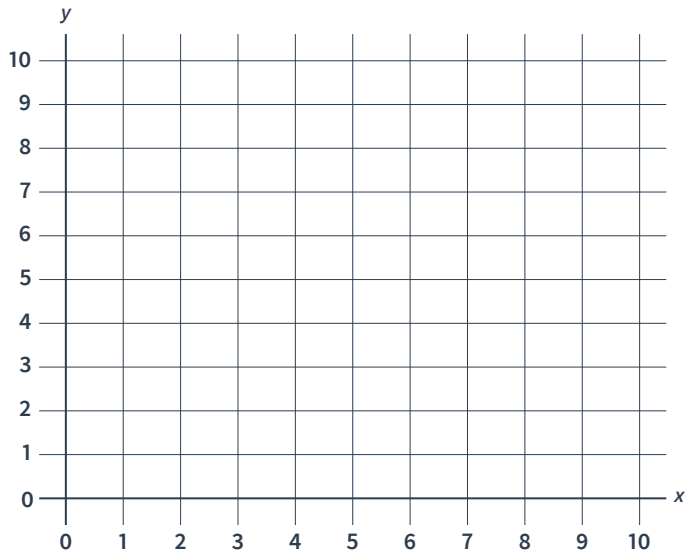
**Q3** An old pirate rhyme says:

"There be gold coins a-plenty

Waiting for you

At two points on the grid:

(0,10) and (8,2)!"




Mark both points where the treasure will be found.

2 marks

**Q1** At a restaurant, the free refill machine only dispenses $\frac{2}{3}$ of a glass of cola at a time.

Daniel thinks the machine is broken, so he presses the button 6 times in a row.

How many glasses of cola will Daniel fill?

4 glasses

1 mark

**Q2** Three of these calculations equal the same amount.

A) $\frac{7}{10} - \frac{1}{5}$

B) $\frac{9}{20} + \frac{1}{10}$

C) $\frac{3}{5} - \frac{1}{10}$

D) $\frac{10}{40} + \frac{10}{40}$

Find the odd calculation out and write the answer.

The odd one out is B. The answer is $\frac{11}{20}$.

1 mark

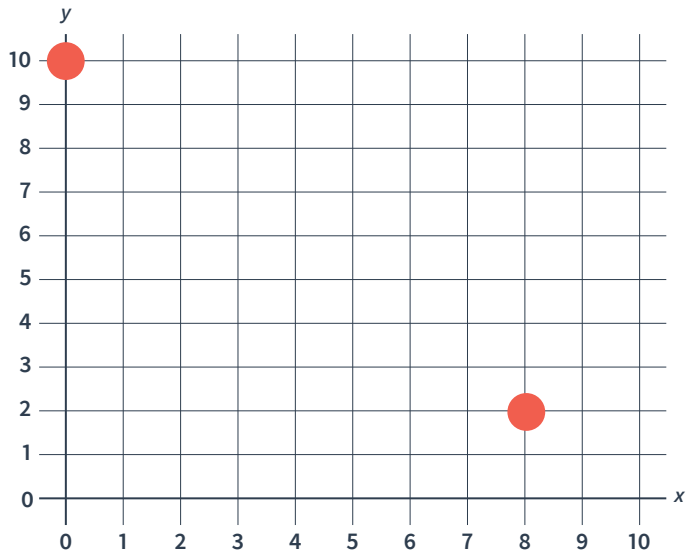
**Q3** An old pirate rhyme says:

"There be gold coins a-plenty

Waiting for you

At two points on the grid:

(0,10) and (8,2)!"




Mark both points where the treasure will be found.

2 marks

| | Requirement | Mark | Additional guidance |
|---|---|---|---|
| Q1 | 4 glasses | 1 | |
| Q2 | Answer B) $\frac{11}{20}$ | 1 | |
| Q3 | Points (0,10) and (8,2) plotted accurately.<br>Award **ONE** mark for each correct plot. | 2 | |

**Q1** A water bottle holds $\frac{3}{4}$ of a litre.

Poppy fills up 11 water bottles.

How many litres of water has she filled?

litres

1 mark

**Q2** Grace wants to compare three fractions cards.

She has a choice of using Set A or Set B.

Grace says, "I will choose Set A because the fractions are easier to compare."

Set A: $\frac{3}{6}$ $\frac{2}{3}$ $\frac{4}{12}$

Set B: $\frac{3}{7}$ $\frac{4}{9}$ $\frac{2}{5}$

Explain why Grace is correct.

1 mark

**Q3** When Number A is divided by 13, the answer is 407.

What is Number A?

A =

2 marks

**Q1** A water bottle holds $\frac{3}{4}$ of a litre.

Poppy fills up 11 water bottles.

How many litres of water has she filled?

$8\frac{1}{4}$ litres

1 mark

**Q2** Grace wants to compare three fractions cards.

She has a choice of using Set A or Set B.

Grace says, "I will choose Set A because the fractions are easier to compare."

Set A: $\frac{3}{6}$ $\frac{2}{3}$ $\frac{4}{12}$

Set B: $\frac{3}{7}$ $\frac{4}{9}$ $\frac{2}{5}$

Explain why Grace is correct.

*See mark scheme for example*

1 mark

**Q3** When Number A is divided by 13, the answer is 407.

What is Number A?

A = 5,291

2 marks

| | Requirement | Mark | Additional guidance |
|---|---|---|---|
| Q1 | $8\frac{1}{4}$ litres | 1 | An appropriate method could be:<br>$407 \times 10 = 4{,}070$<br>$\begin{array}{r} 407 \\ \times \quad 3 \\ \hline 1221 \end{array}$ $\begin{array}{r} 4070 \\ + \quad 1221 \\ \hline 5291 \end{array}$ |
| Q2 | Accept any answer that refers to the fact that the denominators in Set A are all multiples of 3, so they can be converted into the same denominator more easily. | 1 | |
| Q3 | 5,291<br>Award **TWO** marks for a correct answer.<br>Award **ONE** mark for a correct method with one arithmetic error. | 2 | |

**Q1** Ffion says, "If you add my Gran's flat number to my house number, it makes 300."

Ffion's Gran lives at Flat 39.

What number does Ffion live at?

1 mark

**Q2** Pupils in class 5T are trying to calculate the answer to $8 \times \frac{2}{5}$.

Abdul says, "8 × 2 equals 16. The answer is $\frac{16}{5}$. This is the same as $3\frac{1}{5}$."

Zac says, "You need to multiply the denominator too! 8 × 5 equals 40, so the answer is $\frac{16}{40}$. This is the same as $\frac{8}{20}$."

Who is correct? Tick one name.

Abdul ☐ Zac ☐

1 mark

**Q2** Connor wants to put some decimal numbers in the correct order.

Unfortunately, his numbers are made out of number cards and they are all face down!

Tick whether each sentence will be **always**, **sometimes**, or **never** true.

| | always | sometimes | never |
|---|---|---|---|
| Connor only needs to know the digits after the decimal points, to be able to compare the numbers. | | | |
| If Connor reveals the first digit on the left of the decimal point, he will be able to compare the numbers. | | | |
| To compare the numbers, Connor needs to make sure that the decimal points are all lined up. | | | |

2 marks

**Q1** Ffion says, "If you add my Gran's flat number to my house number, it makes 300."

Ffion's Gran lives at Flat 39.

What number does Ffion live at?

261

1 mark

**Q2** Pupils in class 5T are trying to calculate the answer to $8 \times \frac{2}{5}$.

Abdul says, "8 × 2 equals 16. The answer is $\frac{16}{5}$. This is the same as $3\frac{1}{5}$."

Zac says, "You need to multiply the denominator too! 8 × 5 equals 40, so the answer is $\frac{16}{40}$. This is the same as $\frac{8}{20}$."

Who is correct? Tick one name.

Abdul ✓ Zac ☐

1 mark

**Q2** Connor wants to put some decimal numbers in the correct order.

Unfortunately, his numbers are made out of number cards and they are all face down!

Tick whether each sentence will be **always**, **sometimes**, or **never** true.

| | always | sometimes | never |
|---|---|---|---|
| Connor only needs to know the digits after the decimal points, to be able to compare the numbers. | | | ✓ |
| If Connor reveals the first digit on the left of the decimal point, he will be able to compare the numbers. | | ✓ | |
| To compare the numbers, Connor needs to make sure that the decimal points are all lined up. | ✓ | | |

2 marks

| | Requirement | Mark | Additional guidance |
|---|---|---|---|
| Q1 | 261 | 1 | |
| Q2 | Abdul | 1 | |
| Q3 | never, sometimes, always<br>Award **TWO** marks for all three ticked correctly.<br>Award **ONE** mark for any two ticked correctly. | 2 | |

THIRD SPACE LEARNING

Specialist 1-to-1 maths interventions and curriculum resources

# Rapid Reasoning

## Do you have a group of pupils who need a boost in maths this term?

Each pupil could receive a personalised lesson every week from our specialist 1-to-1 maths tutors.

- Raise attainment
- Plug any gaps or misconceptions
- Boost confidence

---

**Speak to us:**


thirdspacelearning.com

0203 771 0095

hello@thirdspacelearning.com


THIRD SPACE LEARNING