

# Relative Frequency

Please write clearly in block capitals

Forename:

Surname:

## Materials

For this paper you must have:

- mathematical instruments



You **can** use a calculator.

## Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

## Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

## Advice

- In all calculations, show clearly how you work out your answer.

1 A spinner can land of one of three options: red, yellow and blue.

(Level 4)

The spinner is biased.

The table below shows the probability that the spinner will land on red and blue.

<b>Colour</b>	Red	Yellow	Blue
<b>Probability</b>	0.53	$x$	0.21

1(a) Work out the probability that the spinner will land in the yellow segment.

[2 marks]

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Answer \_\_\_\_\_

1(b) Pablo spins the spinner 1000 times.

Work out an estimate for the number of times the spinner will land on the red section.

[2 marks]

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Answer \_\_\_\_\_

Turn over for next question

2

Ben is trying to find out how most of his classmates get to school.

*(Level 4)*

He records the data he takes in the table below.

Means of Travel	Frequency
Bus	21
Car	8
Cycle	12
Walk	32
Train	2

Find the relative frequency of the following:

Give each answer to 3 decimal places.

2(a)

Travelling to school by means of a bus, train or car.

**[2 marks]**


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Answer \_\_\_\_\_

2(b)

Travelling to school by means other than walking.

**[2 marks]**


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Answer \_\_\_\_\_

**Turn over for next question**

Turn over ►

- 3(a)** Charlotte has a packet of sweets. Her favourites are the red ones and the purple ones. (Level 4)  
The table below shows the probability of each different sweet being selected

<b>Sweet Colour</b>	Purple	Red	Orange	Green	Yellow
<b>Probability</b>	0.15	0.2	0.3	0.16	-

- 3(a)** Work out the probability that the sweet charlotte pulls out of the packet is yellow.

[2 marks]

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Answer \_\_\_\_\_

- 3(b)** There are 35 sweets in her one packet.  
What number of the sweets are expected to be one of her favourites?

[2 marks]

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Answer \_\_\_\_\_

Turn over for next question

**4** Anna is playing a game called frustration.

(Level 4)

Over the course of the game she rolls a dice 25 times and each result is shown below.

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

**4(a)** Complete the relative frequency table for this data.

[2 marks]

Result	1	2	3	4	5	6
Relative frequency	4					5

**4(b)** Do you believe this dice is biased.

Explain your answer

[2 marks]

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**4(c)** Anna rolls the dice 500 times.

Using the relative frequency given, estimate the number of times that it will land on number six.

[1 mark]

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Answer \_\_\_\_\_

**Turn over for next question**

- 5 Charlotte wants to estimate the number of sweets in a large packet she has. (Level 4)  
The table shows the number of each colour sweet in a small packet.

Sweet Colour	Purple	Red	Orange	Green	Yellow
Number	4	5	6	2	10

- 5(a) Write down the relative frequency of taking a purple sweet out of the small packet.

[2 marks]

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Answer \_\_\_\_\_

- 5(b) Charlotte's large packet has 60 sweets.  
She estimates that there will be 12 purple sweets in the large packet.  
Evaluate Charlotte's prediction.

[1 marks]

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- 6** Tom, Sarah and Mark all roll a biased 5 sided die.  
Their results are summarised in the table below.

(Level 4)

Number	Number of results for that number		
	Tom	Sarah	Mark
1	1	10	20
2	0	3	8
3	3	11	18
4	1	7	15
5	1	5	14

- 6(a)** Calculate two different relative frequencies for the die landing on 4

**[2 marks]**


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Relative frequency 1: \_\_\_\_\_

Relative frequency 2: \_\_\_\_\_

- 6(b)** Which persons data is likely to be closest to the actual relative frequency.  
You must justify your answer.

**[2 marks]**


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Turn over for next question

Turn over ►

7

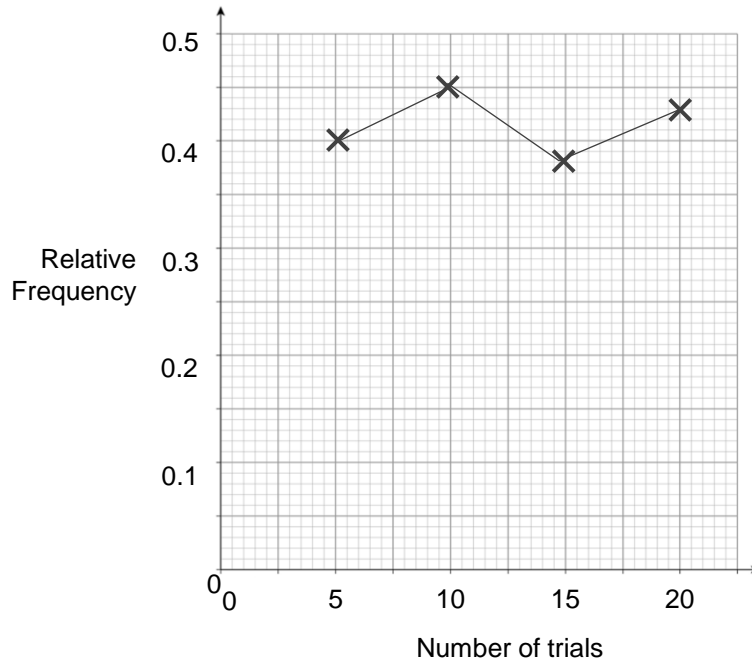
Thomas has a bag containing 200 different coloured marbles.

*(Level 5)*

He wants to find the probability of selecting a white marble.

He does this by randomly selecting a marble out of the bag before replacing it.

Thomas does this 20 times calculating a relative frequency after every five trials.



7(a)

Use the graph to find the number of white marbles Thomas found after the first 5 trials.

**[2 marks]**


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Answer \_\_\_\_\_

7(b)

Estimate the number of white marbles contained within the bag

Explain your answer.

**[2 marks]**


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Answer \_\_\_\_\_