Surname _____

Other Names _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

GCSE
STATISTICS

F

Foundation tier Paper 1

8382/1F

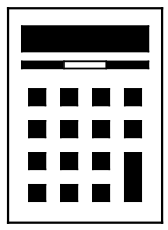
Thursday 13 June 2019 Afternoon

Time allowed: 1 hour 45 minutes

At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]

For this paper you must have:
- **a calculator**
- **mathematical instruments.**



INSTRUCTIONS

- **Use black ink or black ball-point pen. Draw diagrams in pencil.**
- **Answer ALL questions.**
- **You must answer the questions in the spaces provided. Do not write on blank pages.**
- **Do all rough work in this book. Cross out any work you do not want to be marked.**

INFORMATION

- **The marks for the questions are shown in brackets.**
- **The maximum mark for this paper is 80.**
- **You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.**

DO NOT TURN OVER UNTIL TOLD TO DO SO

Answer ALL questions in the spaces provided.

1

What is the name for data that has been collected but not sorted in any way?

Circle your answer. [1 mark]

raw **ordinal** **discrete** **grouped**

1

2

Which of these is LEAST LIKELY to be a constraint that may be faced when designing an investigation?

Circle your answer. [1 mark]

time **cost** **privacy** **temperature**

1

3

For the numbers

3 3 6

circle the measure that has a DIFFERENT VALUE to the others. [1 mark]

range mode median mean

1

[Turn over]

4

A BIASED dice is rolled 100 times.

The number 4 appears 50 times.

Estimate the probability that a 4 will appear on the next roll.

Circle your answer. [1 mark]

$\frac{4}{6}$ $\frac{1}{6}$ $\frac{4}{50}$ $\frac{1}{2}$

1

BLANK PAGE

[Turn over]

5 (a)

Grace buys lunch at her favourite sandwich shop each day.

She records the time (in minutes) she has to queue for each of 20 visits.

3	2	4	2	1	0	2	3	1	1
2	0	0	1	1	0	3	1	2	1

Complete the frequency table, including the remaining headings. [4 marks]

	TALLY	
0		
1		
2		
3		
4		

[Turn over]

5 (b)

Archie collects similar data for the same sandwich shop for 10 visits.

He recorded these times (in minutes).

3 2 3 0 1 44 2 4 3 0

Identify a problem with the data.

Suggest how to deal with the problem.
[2 marks]

Problem _____

_____

_____

Suggestion _____

_____

_____

_____

5 (c)

Pavel collects data for the same shop.

He says,

“I’ve decided to group the data in groups of 5 minutes.”

Comment on Pavel’s decision. [1 mark]

_____

_____

_____

7

6

Quin is a window cleaner who works Monday to Friday each week.

Each day he has a list of 20 houses whose windows he plans to clean.

The table shows the risk, for different types of weather, that a house owner will NOT want their windows cleaning.

WEATHER	RISK
Sunny	0%
Light Rain	50%
Heavy Rain	90%

6 (a)

On Monday there is LIGHT RAIN.

Work out the number of houses whose windows Quin should expect to clean.
[1 mark]

Answer _____

6 (b)

On Tuesday there is HEAVY RAIN.

Show that he should expect to clean the windows of only 2 houses that day.
[1 mark]

6 (c)

By the end of Friday, Quin expected to clean the windows of 54 houses.

Complete the table to show ONE possibility for the remaining weather that week. [2 marks]

DAY	WEATHER
Monday	Light rain
Tuesday	Heavy rain
Wednesday	
Thursday	
Friday	

[Turn over]

6 (d)

That week, the mean number of houses whose windows Quin actually cleaned per day was 12

How does this compare with the expected number given in PART (c)?
[2 marks]

6 (e)

Give a possible reason for the difference between the theoretical and actual results. [1 mark]

7

7

Fracking is a process used to extract oil or gas from the ground.

Some plans are made to use fracking near the town where Amelia lives.

Amelia is strongly opposed to it and decides to get opinions about it from residents in her town.

7 (a)

Amelia decides to ask EVERYONE in the town their opinion.

Circle the name for this data collection method. [1 mark]

sample **observation**

census **experiment**

7 (b)

Why might it NOT be a good idea to try to ask everyone in the town? [1 mark]

[Turn over]

7 (c)

Amelia writes a questionnaire to give to residents.

Write a CLOSED question, with a response section, that Amelia could use to find out the distance a resident lives from the fracking site. [3 marks]

Response section

7 (d)(i)

Write an OPEN question that Amelia could use to find out the age of a resident. [1 mark]

7 (d)(ii)

Was it a good idea to use an open question about age?

Tick (✓) one box.

☐ **Yes**

☐ **No**

Give a reason for your answer. [1 mark]

7 (e)

Another question Amelia writes is,

‘Do you agree that fracking is dangerous and damages the countryside?’

Give TWO criticisms of this question.
[2 marks]

Criticism 1 _____

_____

_____

_____

Criticism 2 _____

_____

_____

_____

9

8

Two ordinary fair dice are rolled and their scores are added to make a total.

8 (a)

Complete the sample space diagram, on the opposite page, to show all the possible totals. [2 marks]

Score on first dice

Score on second dice

+	1	2	3	4	5	6
1	2					
2		4				8
3						
4						
5			8			
6						

[Turn over]

8 (b)

Using your diagram, or otherwise, work out

8 (b)(i)

the probability of scoring a total of 4 [2 marks]

Answer _____

8 (b)(ii)

the probability of scoring MORE on the first dice than on the second dice. [2 marks]

Answer

[Turn over]

6

9

A hotel chain has 800 hotels.

Of these hotels 200 have a car park.

Rogan wants to choose a sample of the hotel managers, stratified by whether they run a hotel with a car park or not.

Rogan wants a total sample size of 60

9 (a)

How many managers who run a hotel with a car park should be in the sample? [2 marks]

Answer

9 (b)

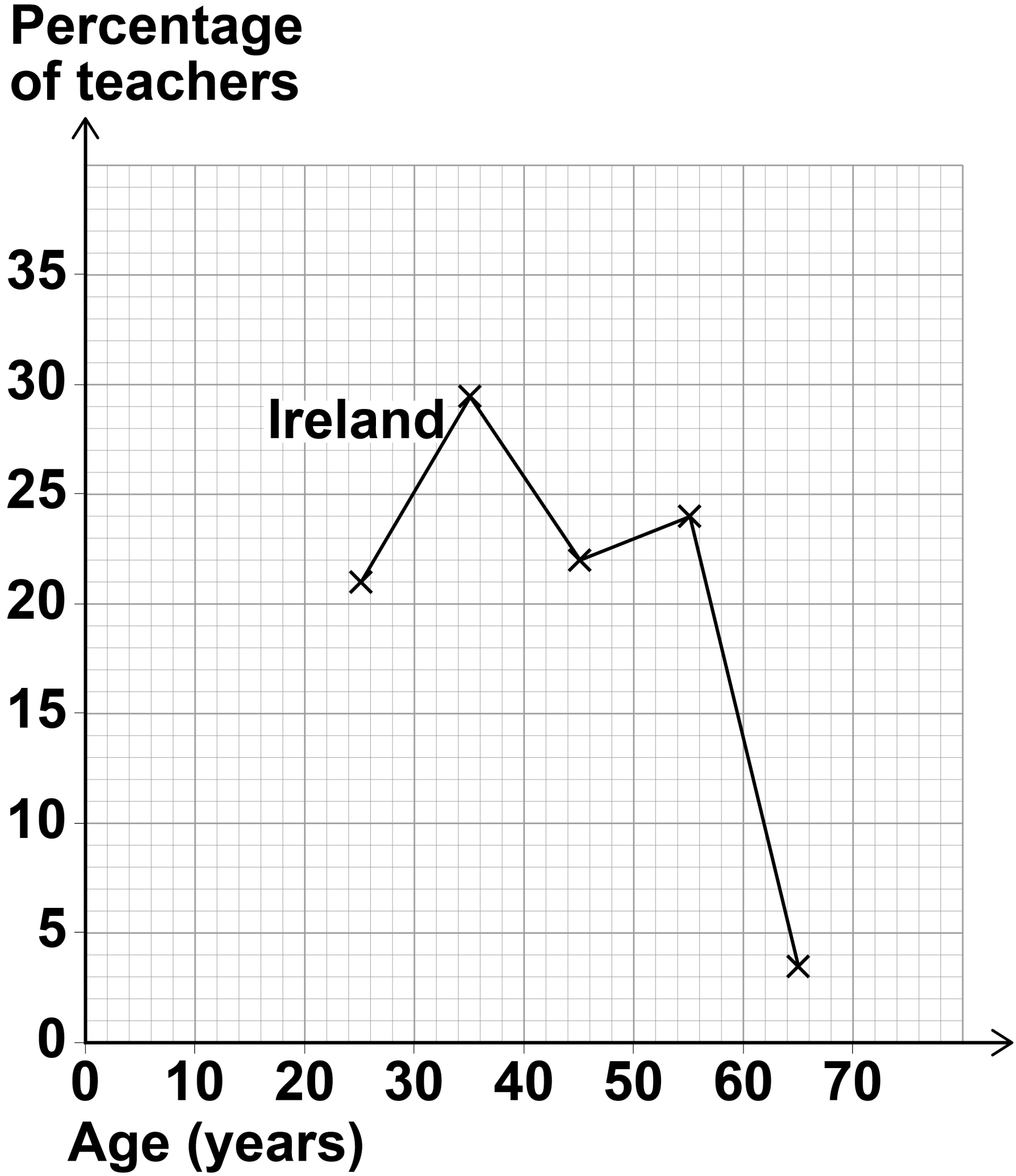
Rogan will email a questionnaire to the managers.

Why will Rogan probably have to send out more than 60 emails IN TOTAL?
[1 mark]

3

10

The grid shows a frequency polygon of the percentage of teachers by age in IRELAND.



10 (a)

Circle the modal age group for teachers in Ireland. [1 mark]

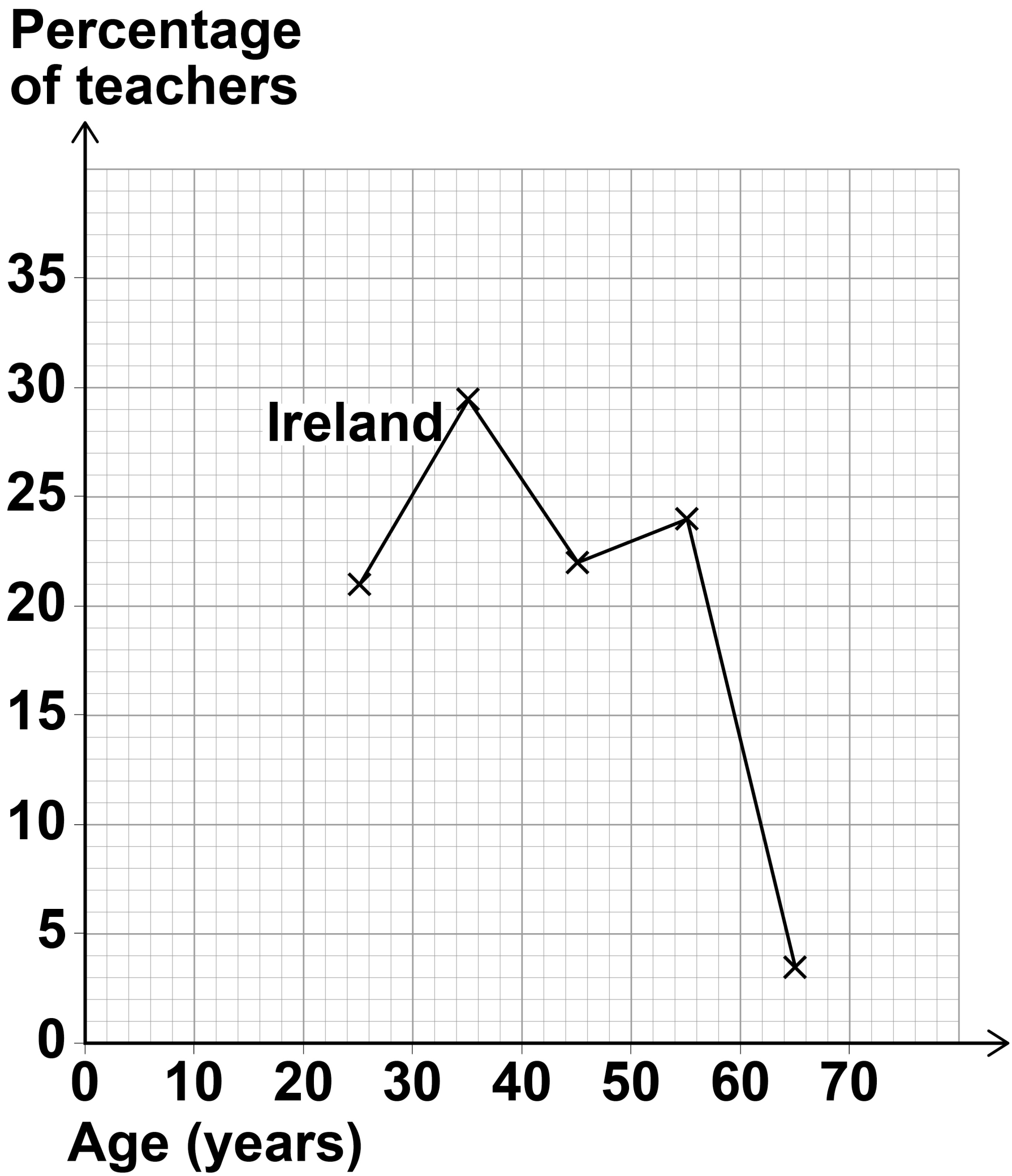
20 – 29 **30 – 39** **40 – 49**

50 – 59 **60 – 69**

10 (b)

Explain why the point for the first group, 20 – 29, is plotted at 25 [1 mark]

REPEAT OF DIAGRAM



10 (c)

The table shows the percentage of teachers by age in NORWAY.

Age (years)	Percentage of teachers
20 – 29	9.2
30 – 39	31.1
40 – 49	19.8
50 – 59	27.9
60 – 69	12.0

Draw a frequency polygon for the Norway data on the same grid on page 32. [2 marks]

[Turn over]

10 (d)

Compare the modal age group for teachers in the two countries. [1 mark]

10 (e)

When comparing the RANGE of ages for the two countries which of these is true?

Tick (✓) one box. [2 marks]

☐ **The range is larger in Ireland.**

☐ **The range is larger in Norway.**

☐ **It is not possible to tell which range is larger.**

☐ **The ranges are the same.**

Give a reason for your answer.

_____

_____

_____

[Turn over]

10 (f)

Make ONE further comparison between the data for Ireland and Norway. [1 mark]

_____

_____

_____

8

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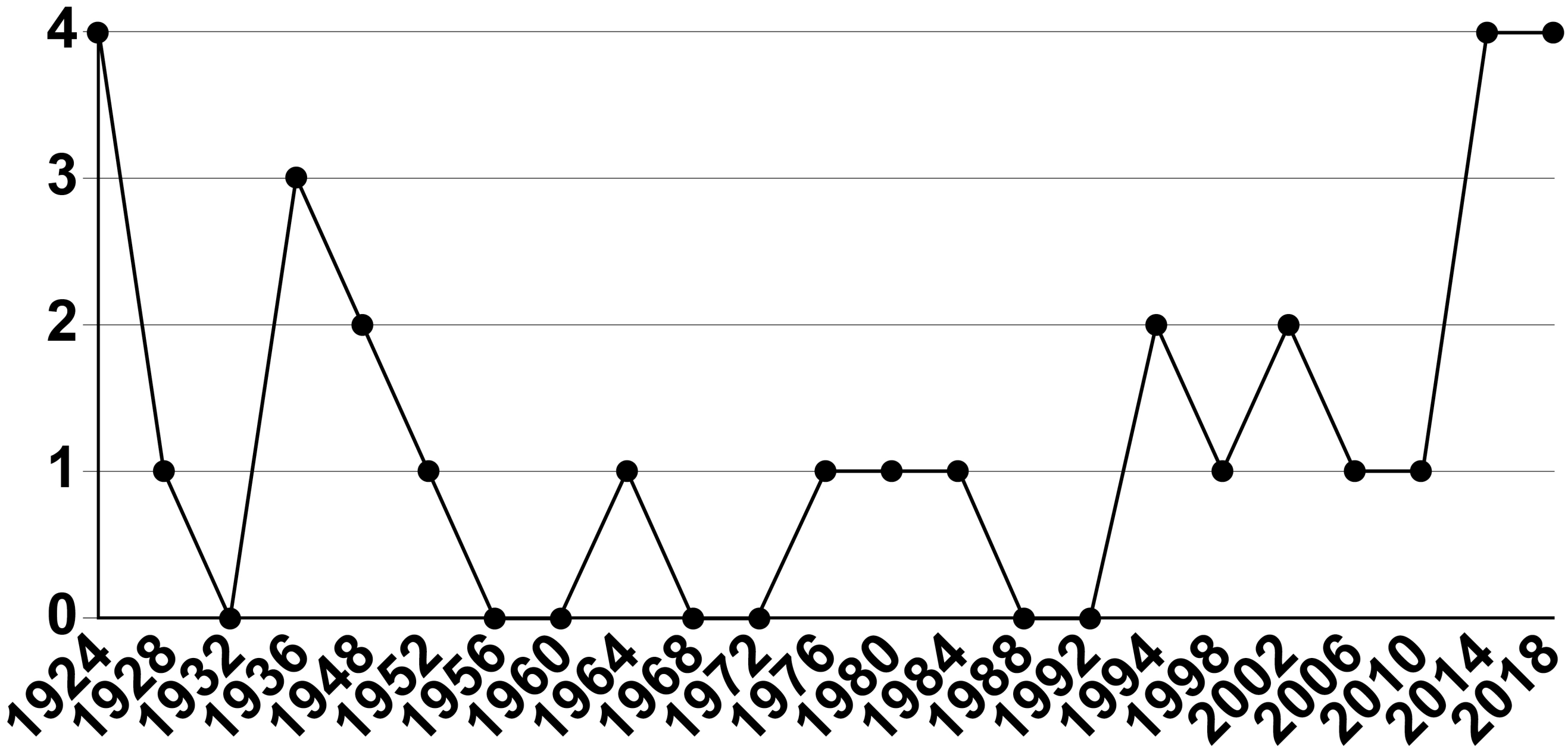
[Turn over]

11

GB medals at the Winter Olympics



KEY

●——● Medals

Source: BBC

The diagram above was produced after the Winter Olympics of 2018.

[Turn over]

11 (a)

Make THREE criticisms of the diagram. [3 marks]

Criticism 1 _____

_____

_____

Criticism 2 _____

_____

_____

Criticism 3 _____

_____

_____

11 (b)

Name a different diagram which would show the data in a more appropriate way. [1 mark]

Answer

4

[Turn over]

12

The table, on pages 44 and 45, from the Office of National Statistics, shows conception (becoming pregnant) rates for women of all ages and for women under 16 from 2000 to 2016.

Source: Office of National Statistics

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[Turn over]

Year of conception	All ages	
	Number of conceptions	Conception rate per 1000 women in age-group
2016	862 785	77.3
2015	876 934	78.3
2014	871 038	77.8
2013	872 849	77.8
2012	884 748	78.5
2011	909 109	80.4
2010	909 245	80.5
2009	896 466	79.3
2008	888 607	78.6
2007	895 867	79.4
2006	869 961	77.5
2005	841 831	75.5
2004	826 809	74.9
2003	806 810	73.5
2002	787 012	72.1
2001	763 668	70.3
2000	766 955	70.9

Year of conception	Under 16	
	Number of conceptions	Conception rate per 1000 women in age-group
2016	2821	3.1
2015	3466	3.8
2014	4160	4.4
2013	4648	4.9
2012	5432	5.6
2011	5991	6.1
2010	6674	6.8
2009	7158	7.2
2008	7586	7.6
2007	8200	8.1
2006	7826	7.7
2005	7930	7.8
2004	7615	7.5
2003	8024	8.0
2002	7875	7.9
2001	7903	8.0
2000	8116	8.3

[Turn over]

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12 (a)

In which of these years were there the most conceptions for UNDER 16s?

Circle your answer. [1 mark]

2000 2003 2007 2010

12 (b)

Describe TWO features or patterns in the data for ALL AGES from 2000 to 2016. [2 marks]

1 _____

_____

_____

2 _____

_____

_____

[Turn over]

12 (c)

Bruno thinks the conception rate calculations for Under 16s are wrong.

He says,

“In 2015 there were 3466 conceptions and the conception rate was 3.8 per thousand.

In 2008, the conception rate was double at 7.6 per thousand but the number of conceptions was 7586

This must be wrong as 7586 is much more than double 3466”

Give TWO reasons why the conception rate calculations are very unlikely to be wrong. [2 marks]

Reason 1 _____

_____

_____

Reason 2 _____

_____

_____

[Turn over]

5

13

The table shows the price of a first class stamp for selected years.

Throughout this question use 1980 as the base year.

YEAR	PRICE
1980	12p
1992	
2008	36p
2018	62p

13 (a)

The index number of the price of a first class stamp in 1992 is 200

Circle the cost of a first class stamp in 1992. [1 mark]

14p **18p** **24p** **36p**

13 (b)

Calculate the index number for 2018

Give your answer to the nearest whole number. [2 marks]

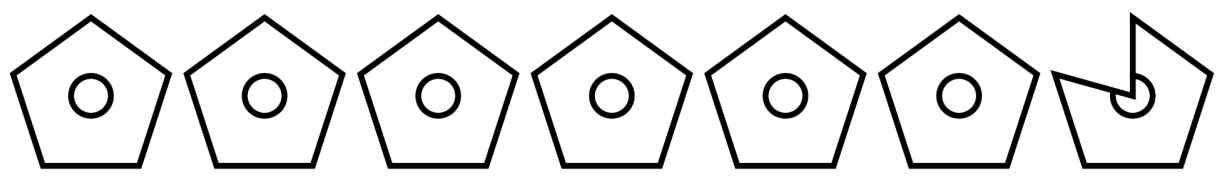
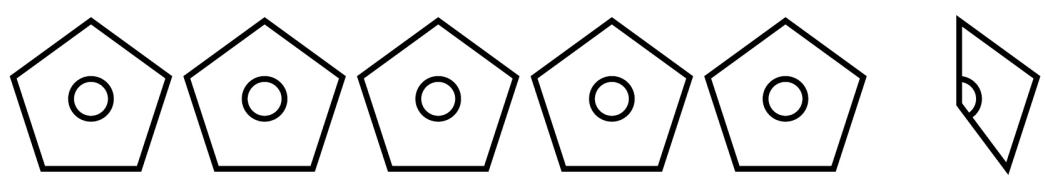
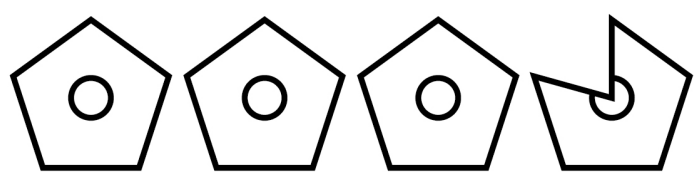
Answer _____

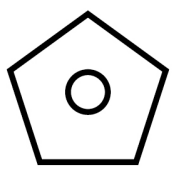
3

14

A bird charity places nest boxes in three woodlands, Staple Woods, East Valley Woods and Stourness Woods.

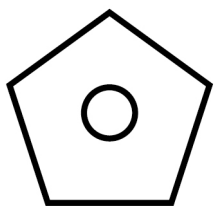
The pictogram shows the number of nest boxes it places in each woodland.

Staple Woods	
East Valley Woods	
Stourness Woods	

KEY:  **represents _____ nest boxes**

14 (a)

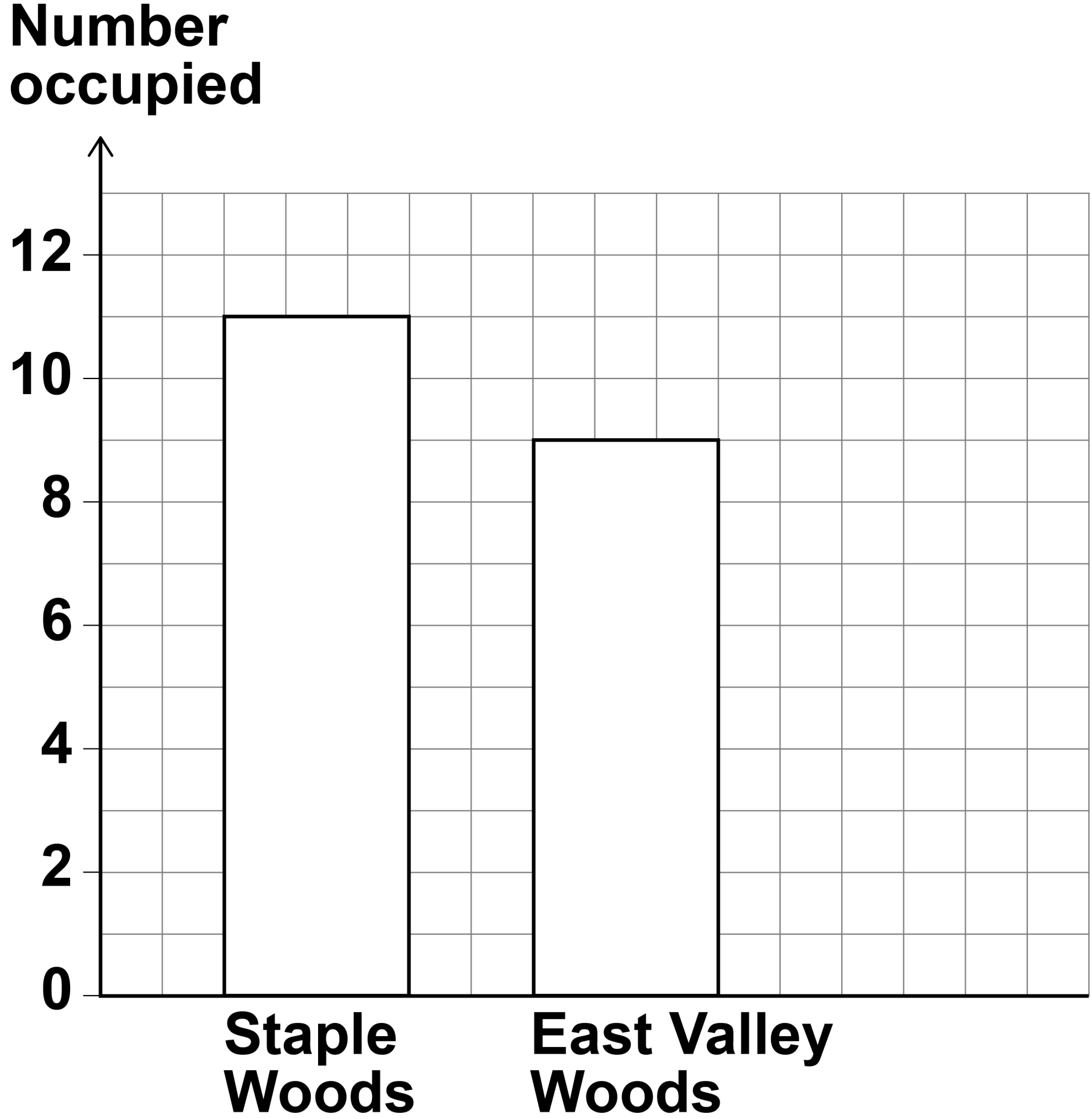
The charity places 24 more nest boxes in East Valley Woods than it places in Stourness Woods.

Show that  **represents**

15 nest boxes. [2 marks]

At the end of the year, the charity checks the nest boxes to see if they have been occupied by birds.

The bar chart shows the number of occupied nest boxes in two of the woodlands.



14 (b)

Mandy claims that a greater proportion of the nest boxes in Staple Woods were occupied than the boxes in East Valley Woods.

Is she correct?

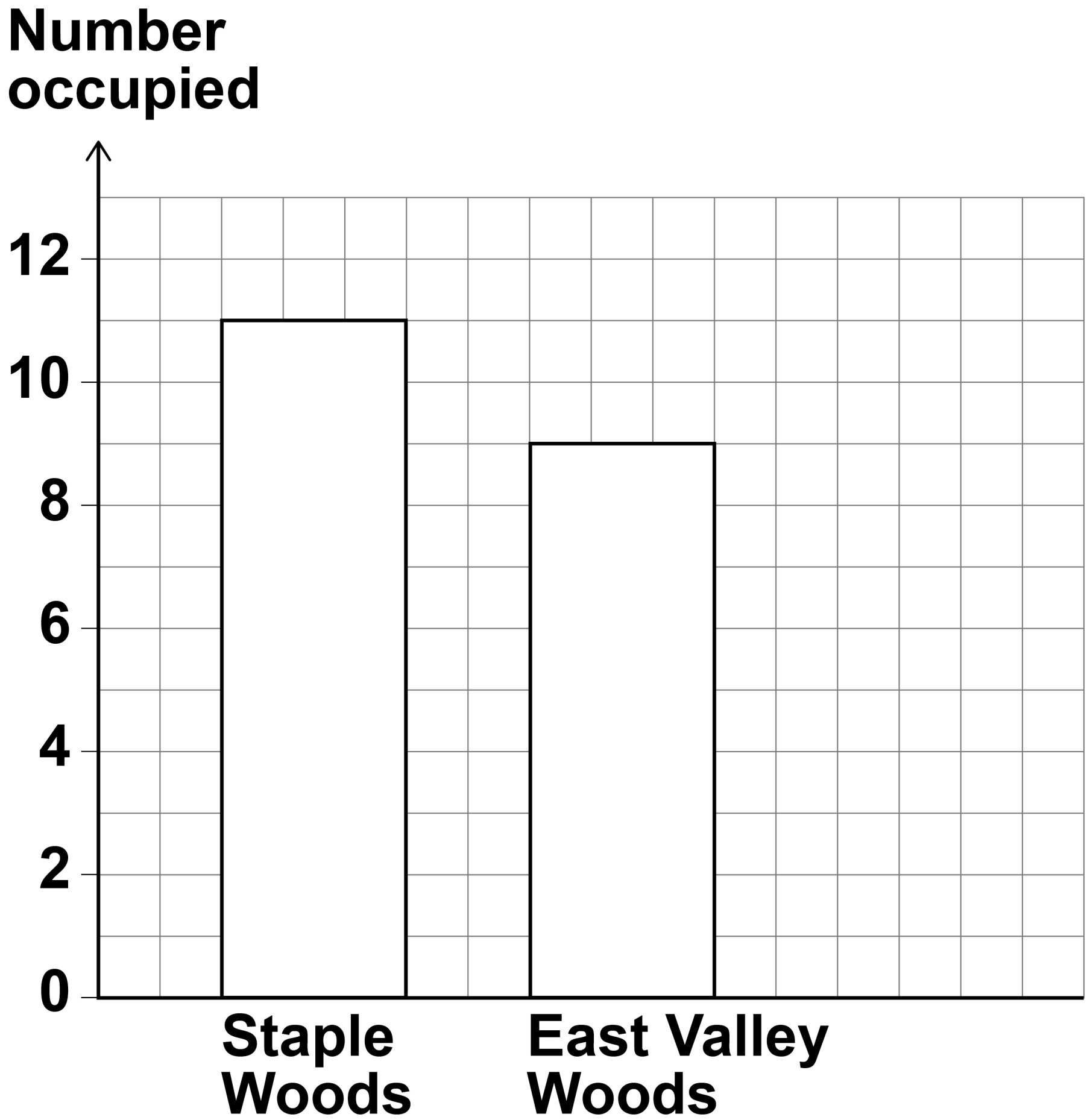
Tick (✓) one box.

☐ **Yes**

☐ **No**

You MUST show your working. [3 marks]

REPEAT OF DIAGRAM



14 (c)

The charity finds that exactly 10% of all the nest boxes have been occupied.

Complete the bar chart, repeated on the opposite page, to show the number of occupied nest boxes in Stourness Woods, shown in the pictogram on page 52. [3 marks]

8

15

Charlie wants to investigate how people do most of their travelling.

She begins by asking 30 of her friends how they travel to school.

15 (a)

Write down a question that Charlie could ask. [1 mark]

_____

_____

_____

BLANK PAGE

[Turn over]

15 (b)

The frequency table shows Charlie's results.

Method of Travel	Frequency
Car	3
Bus	6
Walk	18
Cycle	2
Train	1

Charlie says,
"10% of these friends come to school by car, so 10% of all students come to school by car."

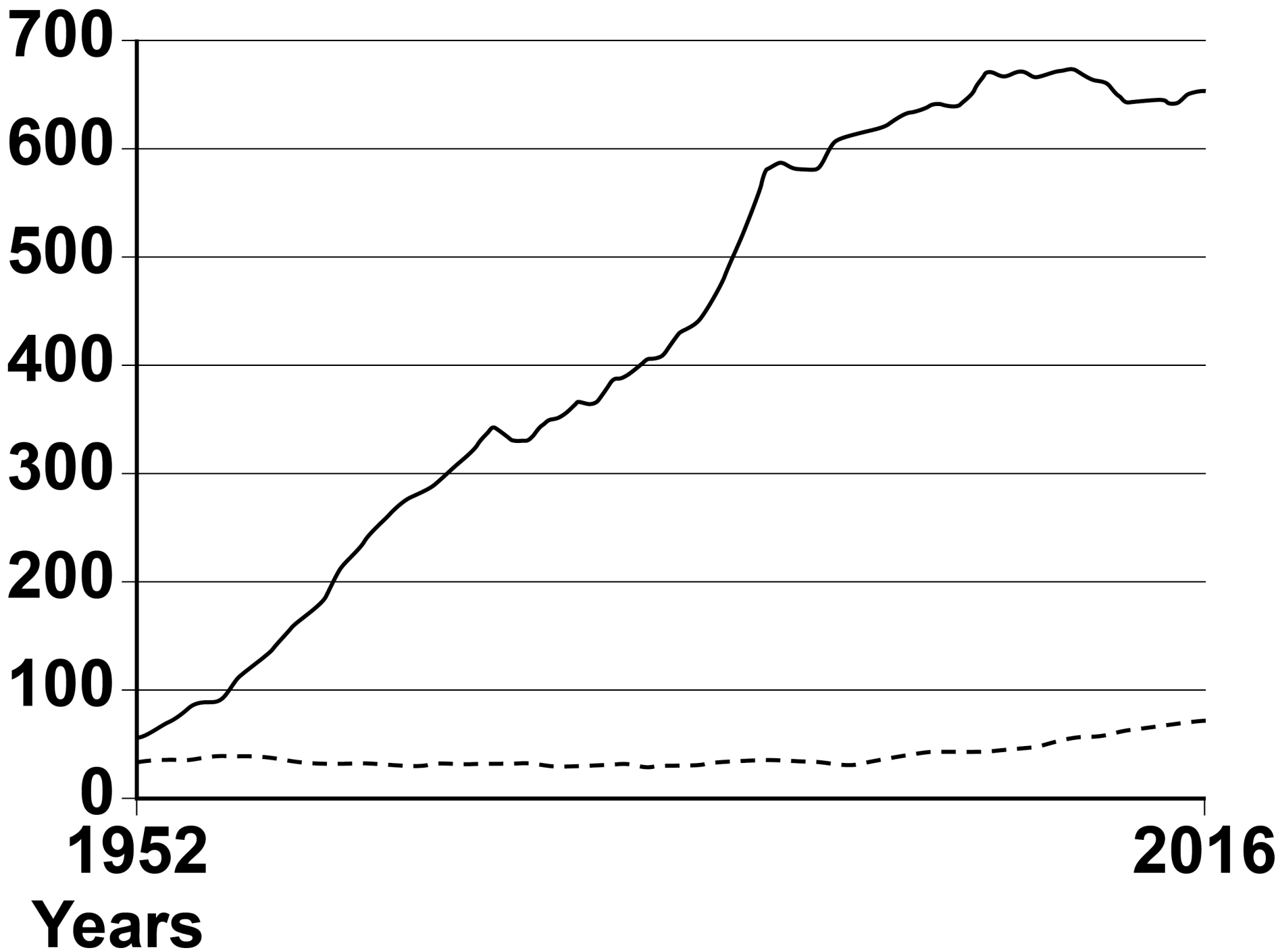
Comment on BOTH PARTS of Charlie's statement. [2 marks]

“10% of these friends come to school by car”

“10% of all students come to school by car”

[Turn over]

15 (c)



KEY

—— Cars, vans and taxis

----- Rail

Source: adapted from Department for Transport

Charlie hears on the news that more people than ever are using cars to travel and roads are getting busier.

She sees the graph, shown on the opposite page, on a news website.

Comment, with a reason, whether or not the graph confirms that,

15 (c) (i)

more people are using their cars to travel. [1 mark]

[Turn over]

BLANK PAGE

15 (c) (ii)

roads are getting busier. [1 mark]

15 (d)

Using the graph on page 64, make TWO statements about RAIL travel over the years. [2 marks]

15 (e)

Charlie decides to look into rail travel in more depth.

She asks 12 of her friends how many times they have been on a train in the last year. The results, in ascending order, are

0 0 0 0 0 1 1 2 4 6 7 387

Charlie says,

“The average number of times my friends have been on a train in the last year is 34”

15 (e) (i)

Which measure of average did Charlie work out?

Show working to support your answer. [2 marks]

Answer

15 (e) (ii)

Comment on the use of this measure of average in this context. [1 mark]

[Turn over]

15 (e) (iii)

Discuss the suitability of TWO other measures of average Charlie could use.

Suggest which would be the best measure of average to use. [3 marks]

15 (f)

Name ONE piece of primary data used in Charlie's investigation. [1 mark]

15 (g)

Name ONE piece of secondary data used in Charlie's investigation. [1 mark]

[Turn over]

15 (h)

Give ONE way that Charlie could have improved the data collection at any point in her investigation. [1 mark]

END OF QUESTIONS

16

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For Examiner's Use	
Question	Mark
1	
2	
3	
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5	
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7	
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9	
10	
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12	
13	
14	
15	
TOTAL	

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