

- 1 A random sample of students in a school is asked about their lunch arrangements. The table shows their responses.

	School dinner	Sandwiches	Home	Local shop
Frequency	82	58	36	24

- (a) (i) Complete the table of relative frequencies for these data. Give each answer as a decimal.

	School dinner	Sandwiches	Home	Local shop
Relative frequency				

[3]

- (ii) Explain why it is reasonable to use the relative frequencies as estimates of probability.

.....  
 ..... [1]

- (b) Use the data to work out an estimate of the probability that a student, chosen at random, either goes home or goes to the local shop for lunch.

(b) ..... [2]

- (c) There are 3200 students in the school altogether.

How many of these would you expect to have a school dinner?

(c) ..... [2]

- 2 (a) Josh is designing a survey about the trees people have in their gardens.

Complete this part of the survey by adding suitable response boxes for this question.

What is the height of the tallest tree in your garden?
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[2]

- (b) Josh wants to survey a sample of 50 students from his school.  
The sample is to be representative of the different year groups.

This table shows how many students there are in each year group.

Year	Number of students
7	202
8	178
9	162
10	139
11	142
Total	823

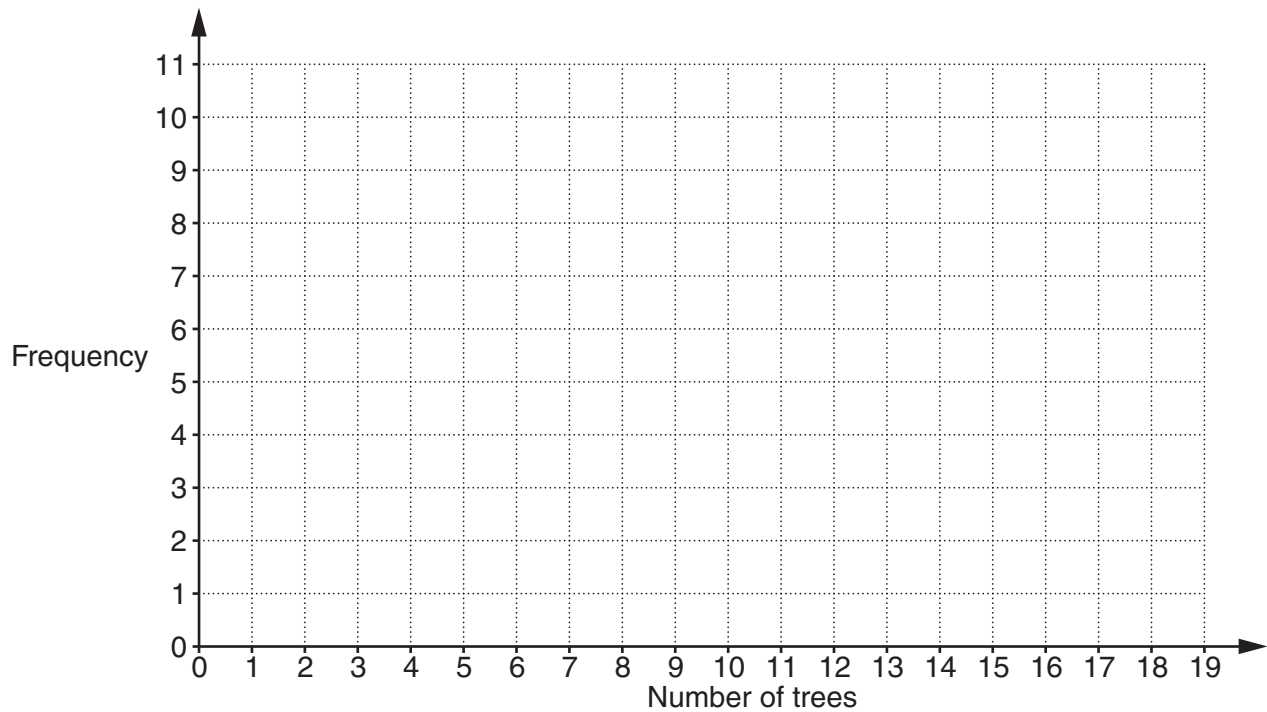
Calculate how many of the students in the sample should be from year 7.

(b) \_\_\_\_\_ [2]

(c) This table summarises the number of trees in the gardens of the 25 houses in Brackley Close.

Number of trees	Frequency
0 – 4	7
5 – 9	10
10 – 14	6
15 – 19	2

(i) Draw a frequency polygon to represent this information.



[3]

(ii) Calculate an estimate of the mean number of trees in a garden in Brackley Close.

(c)(ii) \_\_\_\_\_ [4]

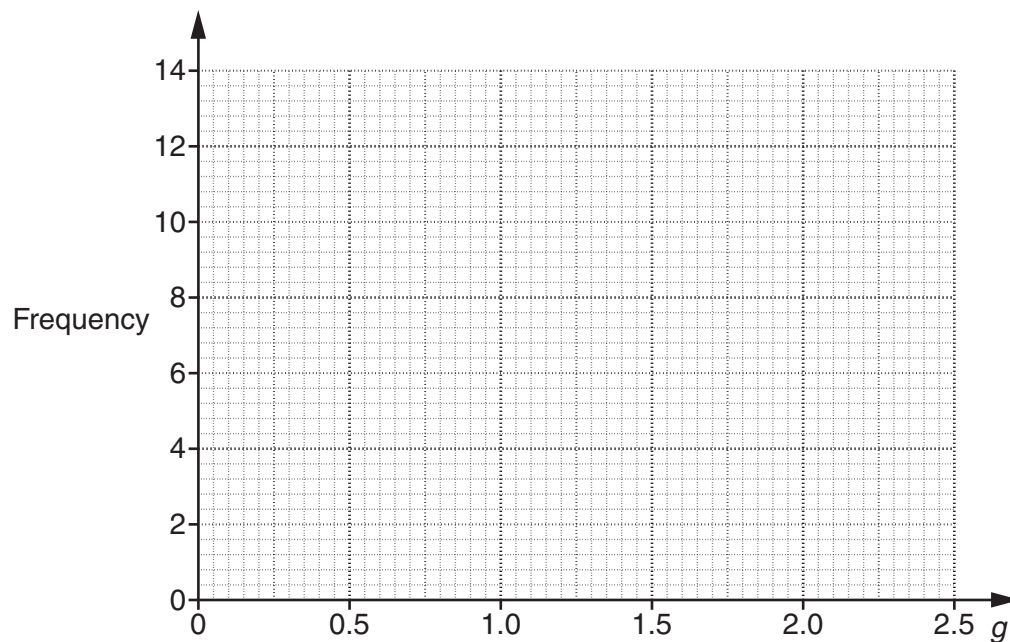
- 3 This table summarises the average number of goals scored by teams per game in the Football World Cup in 2010.

Average number of goals scored by a team per game ( $g$ )	Number of teams
$0 \leq g < 0.5$	5
$0.5 \leq g < 1.0$	7
$1.0 \leq g < 1.5$	13
$1.5 \leq g < 2.0$	5
$2.0 \leq g < 2.5$	2

- (a) State the modal group for these data.

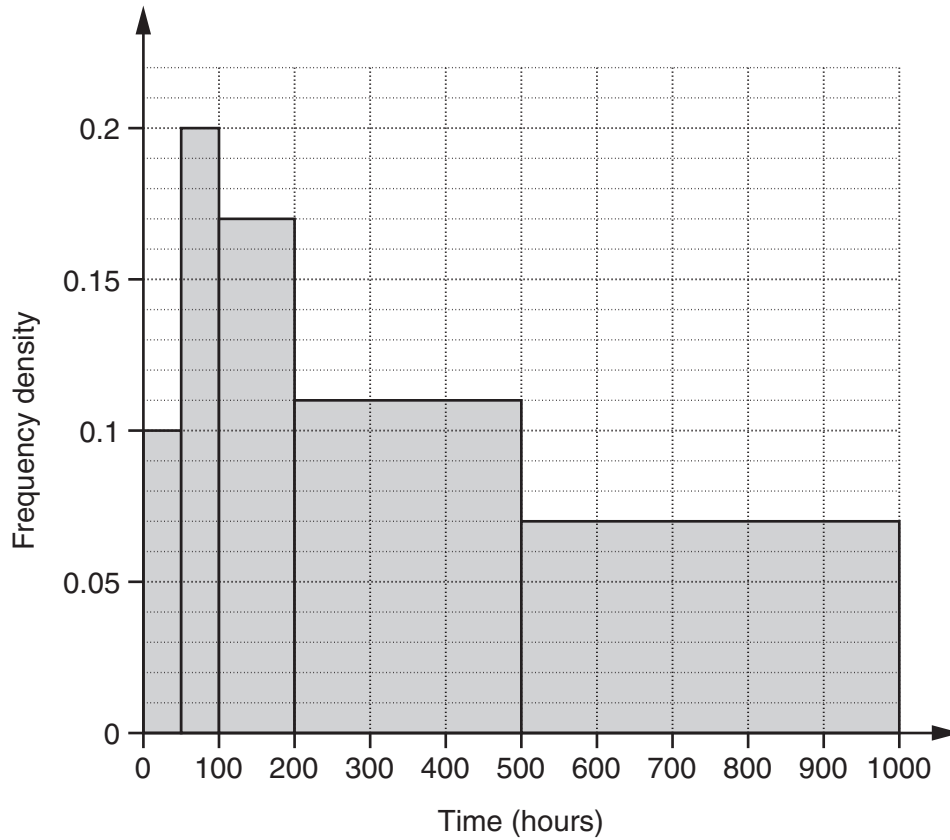
(a) \_\_\_\_\_ [1]

- (b) Draw a frequency polygon to represent the data.



[3]

- 4 Some light bulbs were tested to see how long they lasted.  
 This histogram summarises the results for a sample of 100 light bulbs of one type.



The company which makes the light bulbs claims that the mean length of time the light bulbs last is over 400 hours.

- (a) Complete the frequency distribution, and then use calculations to show that this sample meets the company's claim.

Time ( $t$ hours)	Frequency
$0 \leq t < 50$	5
$50 \leq t < 100$	
$100 \leq t < 200$	

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- (b) Explain why calculations using information about each of the individual light bulbs may show that the sample does not meet the company's claim.

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[1]