

Programme 5 Cumulative Frequency

Worksheet 1: Programme Questions

1. In the frequency table for the snakeboarding competition, what is the first class interval?

2. How many people competed altogether?

3. Which axis is always used for cumulative frequency?

4. What expression is used to calculate the median value?

5. What are the names of the values $\frac{1}{4}$ and $\frac{3}{4}$ of the way into the data?

6. Where does Katie go to be measured up?

7. What single measurement is the subject of Katie's cumulative frequency table?

8. What value does the horizontal axis start at on the cumulative frequency graph?

9. Which part of the box plot diagram shows the interquartile range?

10. The box plots are used to compare two age groups (16 to 30 year olds and 31 to 54 year olds). Which age group had the greater median measurement?

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Worksheet 2: Tick or Trash

Here are some questions and answers (by Students A and B) on cumulative frequency. Decide which answers to Tick (correct) and which to Trash (incorrect). Give reasons.

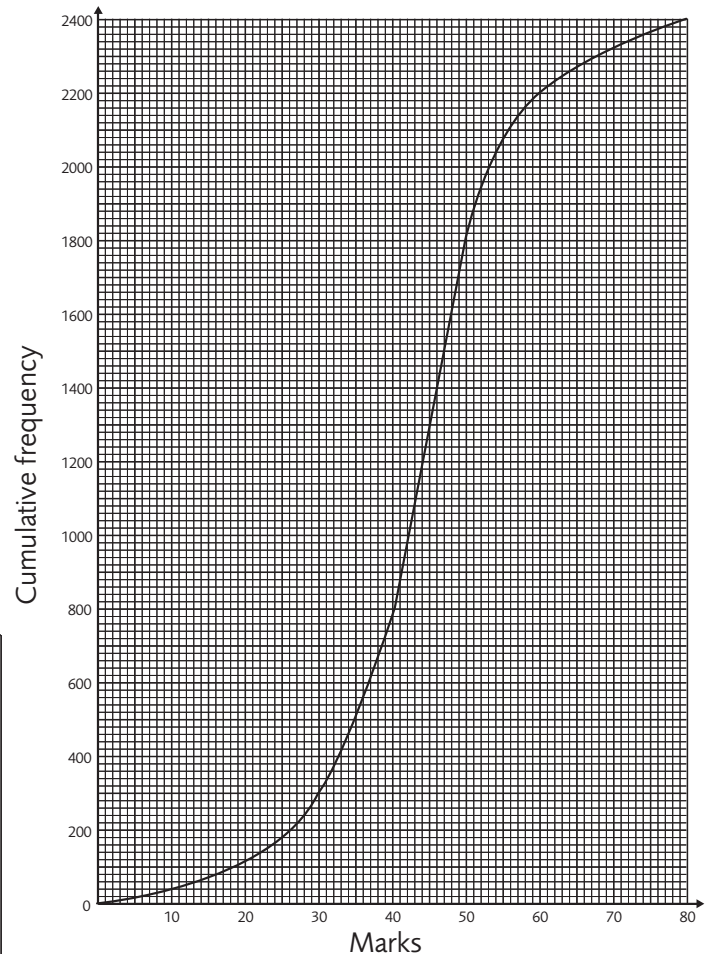
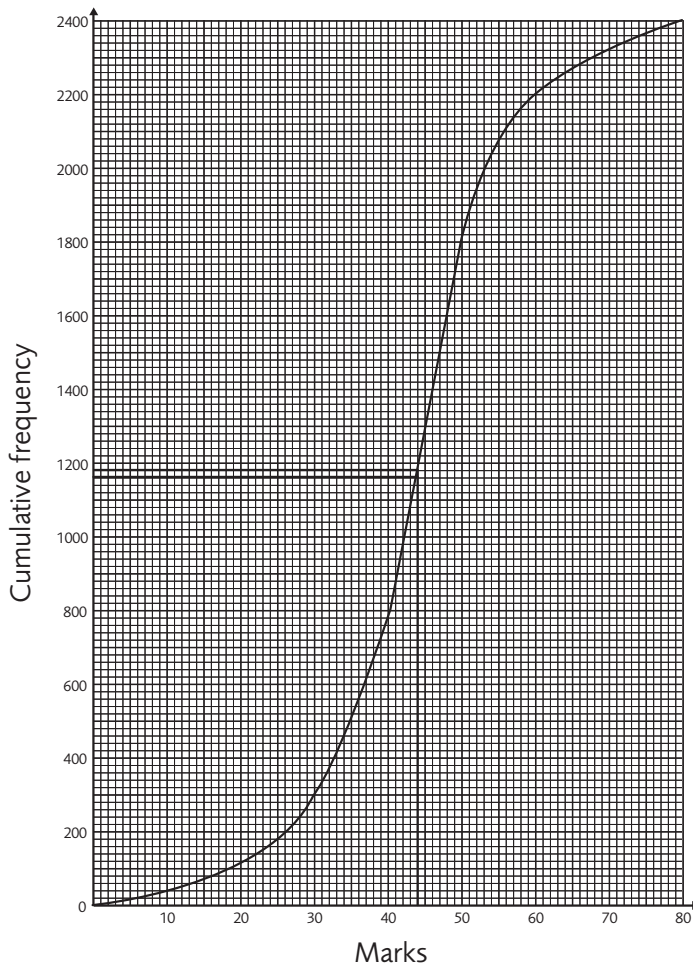
Question 1

2400 people took an examination paper.
The maximum mark for this paper was 80.
The cumulative frequency graph opposite gives information about the marks.
The pass mark was 44 marks.

Use the cumulative frequency graph to estimate the number of people who do **not** pass this paper.

Student A Answer

1190 people



Student B Answer

Note: B drew the same lines on the cumulative frequency graph as A to help work out the answer.

1180 people

Maths 4 Real 2

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Worksheet 2: Tick or Trash

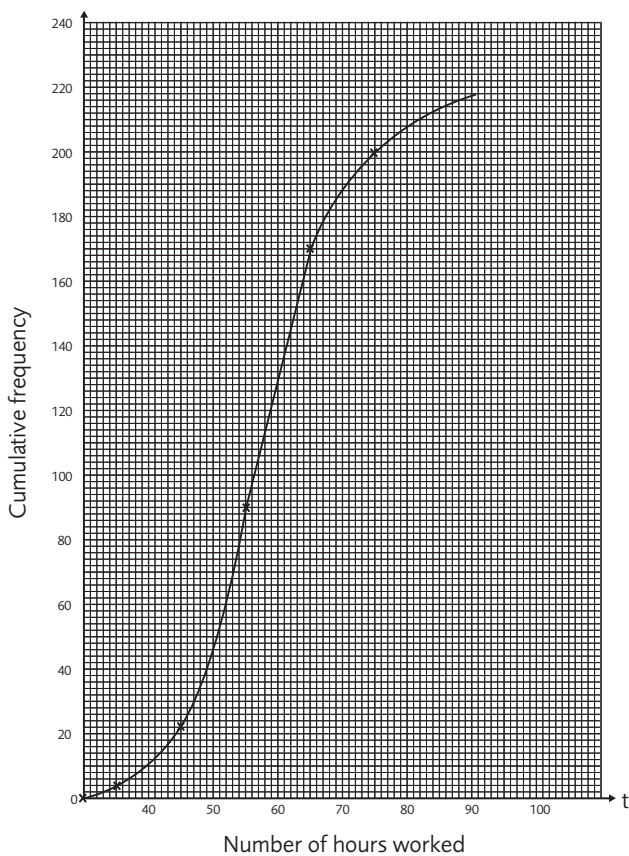
Question 2

Here is a cumulative frequency table which shows the number of hours worked by each of 200 headteachers in one week.

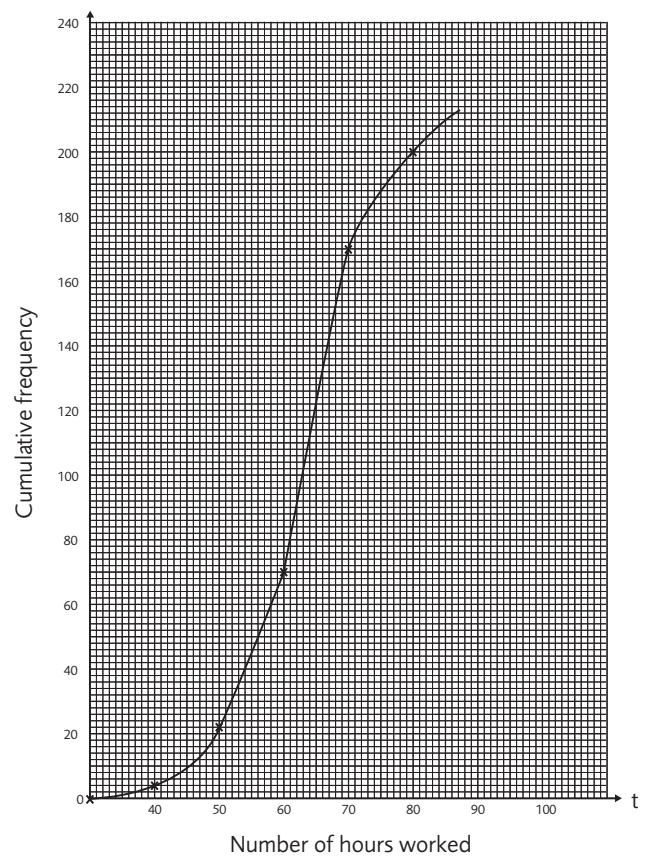
Number of hours worked (t)	Cumulative frequency
$0 < t \leq 30$	0
$0 < t \leq 40$	4
$0 < t \leq 50$	22
$0 < t \leq 60$	90
$0 < t \leq 70$	169
$0 < t \leq 80$	200

On the grid, draw a cumulative frequency graph for your table.

Student A Answer



Student B Answer



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Worksheet 3: Exam Practice Questions (Edexcel)

Question 1

National curriculum reference: D2d Date: November 1998 Paper: 3

The table gives information about the ages, in years, of 100 aeroplanes.

Age (t years)	Frequency
$0 < t \leq 5$	41
$5 < t \leq 10$	26
$10 < t \leq 15$	20
$15 < t \leq 20$	10
$20 < t \leq 25$	3

(a) Work out an estimate of the mean age of the aeroplanes.

(4 marks)

(b) Complete the cumulative frequency table.

(1 mark)

Age (t years)	Frequency
$0 < t \leq 5$	
$0 < t \leq 10$	
$0 < t \leq 15$	
$0 < t \leq 20$	
$0 < t \leq 25$	

(c) On the grid, draw a cumulative frequency graph for your table.

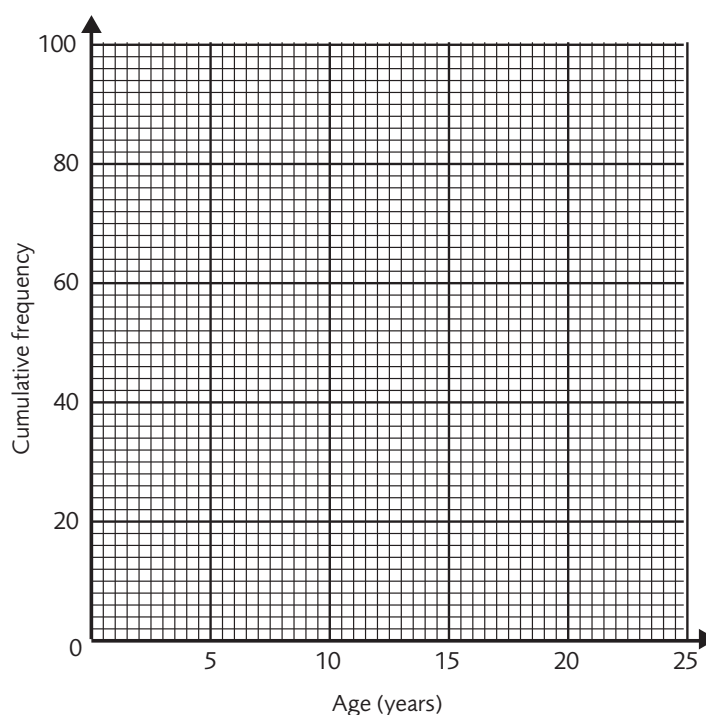
(2 marks)

(d) Use your graph to find an estimate of the upper quartile of the ages.

Show your method clearly.

(2 marks)

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Worksheet 3: Exam Practice Questions (Edexcel)

Question 2

National curriculum reference: D2d Date: November 1998 Paper: 3

Twenty-five people took part in a competition.

The points scored are grouped in the frequency table below.

Points scored	Number of people
1 to 5	1
6 to 10	2
11 to 15	5
16 to 20	7
21 to 25	8
26 to 30	2

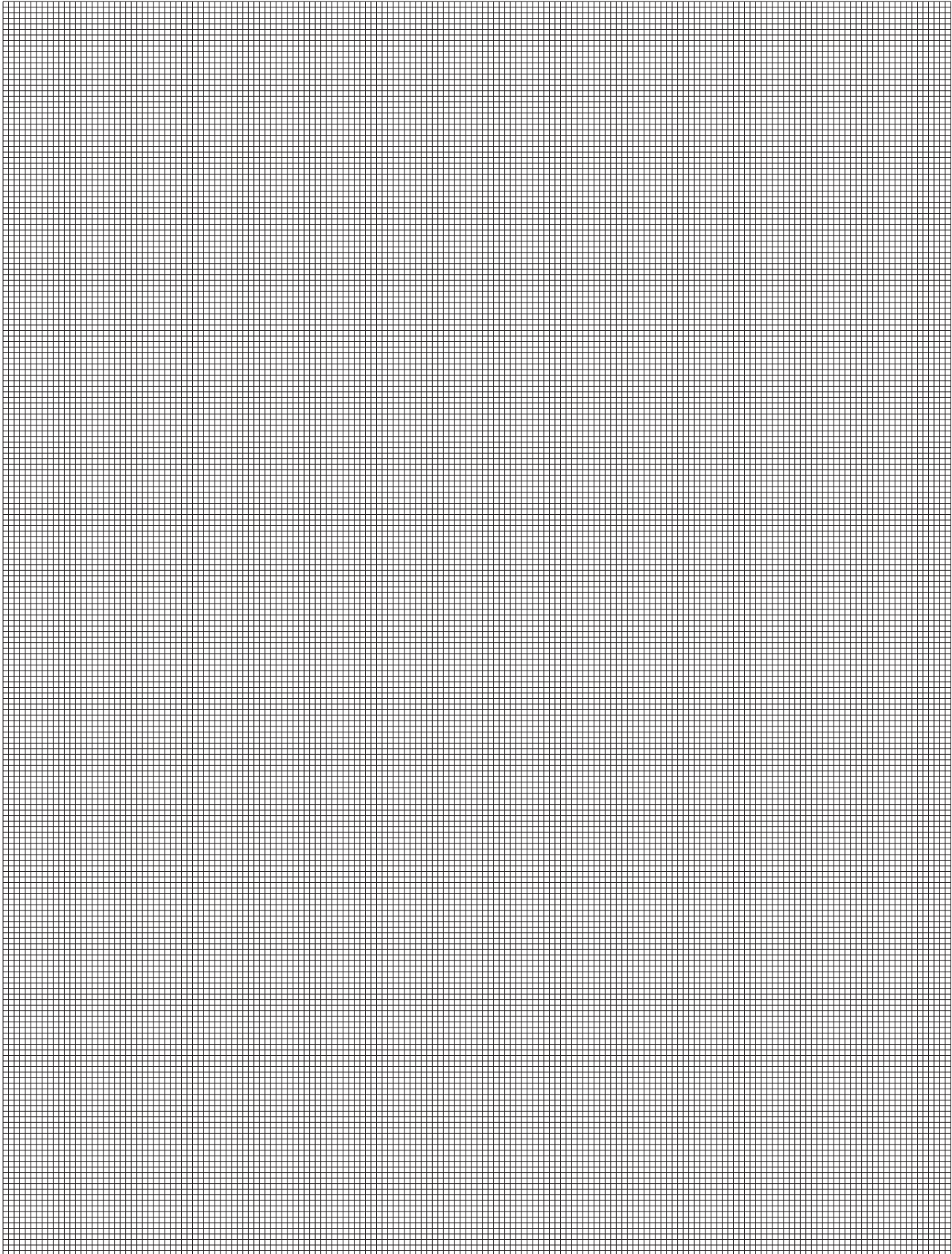
- (a) Work out the class interval which contains the median. (2 marks)
- (b) Work out an estimate for the mean number of points scored. (3 marks)
- (c) Complete the table below to show the cumulative frequency for this data. (2 marks)

Points scored	Cumulative frequency
1 to 5	
1 to 10	
1 to 15	
1 to 20	
1 to 25	
1 to 30	

- (d) On the grid below, draw a cumulative frequency graph for this data. (3 marks)
- (e) Use your graph to work out an estimate for the median for this data. (1 mark)

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Worksheet 3: Exam Practice Questions (Edexcel)



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Worksheet 3: Exam Practice Questions (Edexcel)

Question 3

National curriculum reference: D2d Date: November 1997 Paper: 4

150 year 11 pupils took a mathematics examination. The table shows information about their marks.

Marks (x)	Frequency
$0 \leq x < 20$	6
$20 \leq x < 30$	17
$30 \leq x < 40$	22
$40 \leq x < 50$	45
$50 \leq x < 60$	26
$60 \leq x < 70$	19
$70 \leq x < 80$	9
$80 \leq x < 100$	6

(a) Complete the cumulative frequency table below.

Marks (x)	Cumulative frequency
$0 \leq x < 20$	
$0 \leq x < 30$	
$0 \leq x < 40$	
$0 \leq x < 50$	
$0 \leq x < 60$	
$0 \leq x < 70$	
$0 \leq x < 80$	
$0 \leq x < 100$	

(b) On the grid below, draw a cumulative frequency diagram to show these marks.

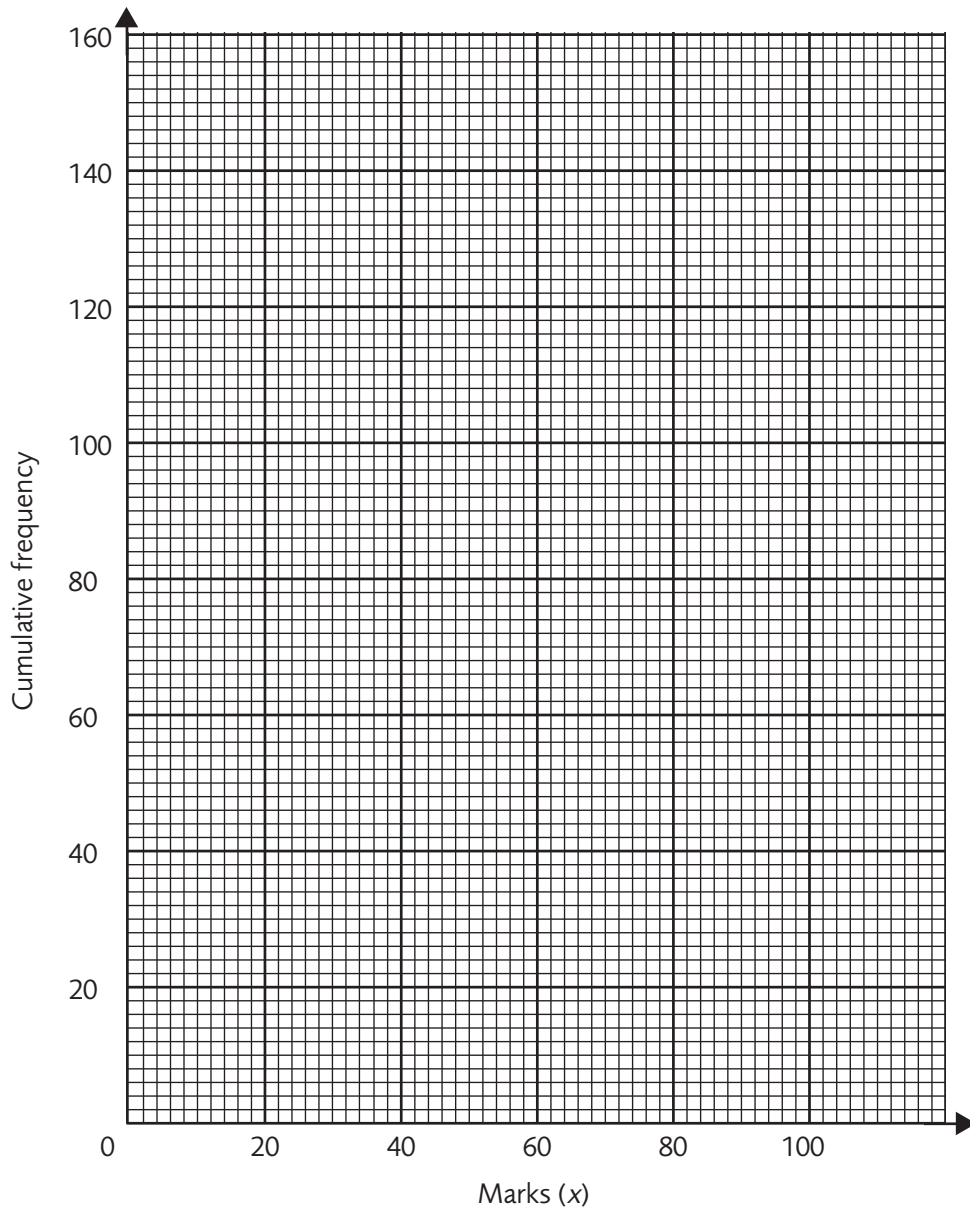
60% of the pupils passed the examination.

(c) Use your diagram to find an estimate for the pass mark for the examination.

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Worksheet 3: Exam Practice Questions (Edexcel)



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Worksheet 3: Exam Practice Questions (Edexcel)

Question 4

National curriculum reference: D2c Date: June 1995 Paper: 1

Pippa collected data for the heights (h) of the students in her class.

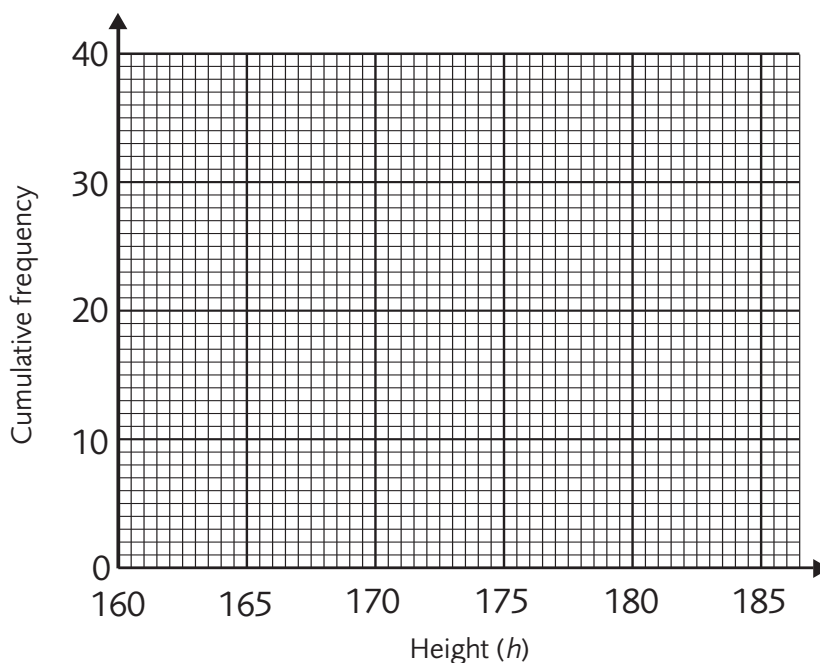
Here is the grouped frequency table of her results.

Height (h) in cm	Frequency	
$160 \leq h < 165$	7	
$165 \leq h < 170$	6	
$170 \leq h < 175$	2	
$175 \leq h < 180$	10	
$180 \leq h < 185$	5	

(a) Use the table to calculate an estimate of the mean for her results.

(b) Complete the cumulative frequency table for Pippa's data and hence draw a cumulative frequency graph for the data.

Group	Frequency	Cumulative frequency
$160 \leq h < 165$	7	7
$165 \leq h < 170$	6	
$170 \leq h < 175$	2	
$175 \leq h < 180$	10	
$180 \leq h < 185$	5	



(c) Use the cumulative frequency graph to calculate
 i) the median, and
 ii) the interquartile range of the data.

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Worksheet 3: Exam Practice Questions (Edexcel)

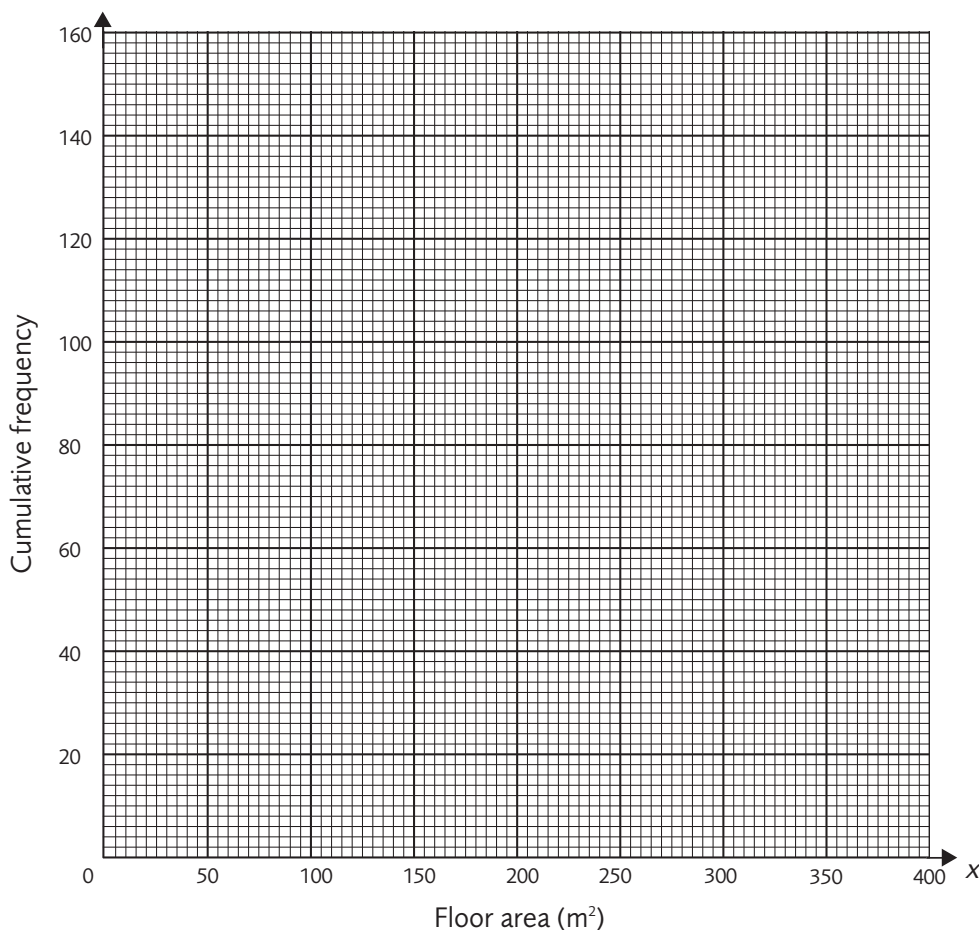
Question 5

National curriculum reference: D2c Date: June 1997 Paper: 3

A survey is made of all 120 houses on an estate.
The floor area, in m^2 , of each house is recorded.
The results are shown in the cumulative frequency table.

Floor area (x) in m^2	Cumulative frequency
$0 < x \leq 100$	4
$0 < x \leq 150$	20
$0 < x \leq 200$	49
$0 < x \leq 250$	97
$0 < x \leq 300$	114
$0 < x \leq 350$	118
$0 < x \leq 400$	120

- (a) On the grid, draw a cumulative frequency graph for the table.



- (b) Use your cumulative frequency graph to estimate the interquartile range of the floor areas of the houses.

The houses on the estate with the greatest floor areas are called luxury houses.
10% of the houses are luxury houses.

- (c) Use your graph to estimate the minimum floor area for a luxury house.

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Total = 45