

## CUMULATIVE FREQUENCY – PRACTICE QUESTIONS



metatutor

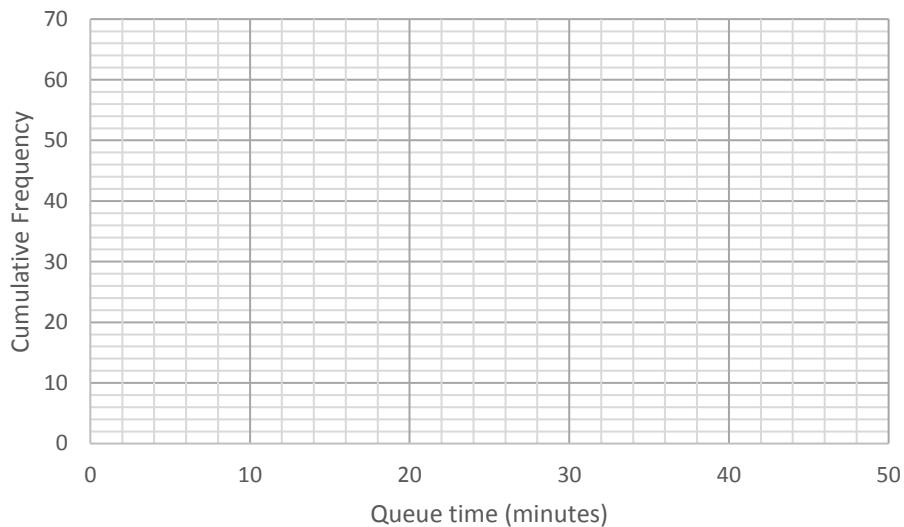
1.

The frequency table below shows the queue times for a roller coaster.

(a) Complete the Cumulative Frequency column.

Time (minutes)	Frequency	Cumulative Frequency
$0 \leq x < 10$	24	
$10 \leq x < 20$	18	
$20 \leq x < 30$	14	
$30 \leq x < 40$	8	
$40 \leq x < 50$	6	

(b) Use the information to plot a cumulative frequency graph on the axis below.

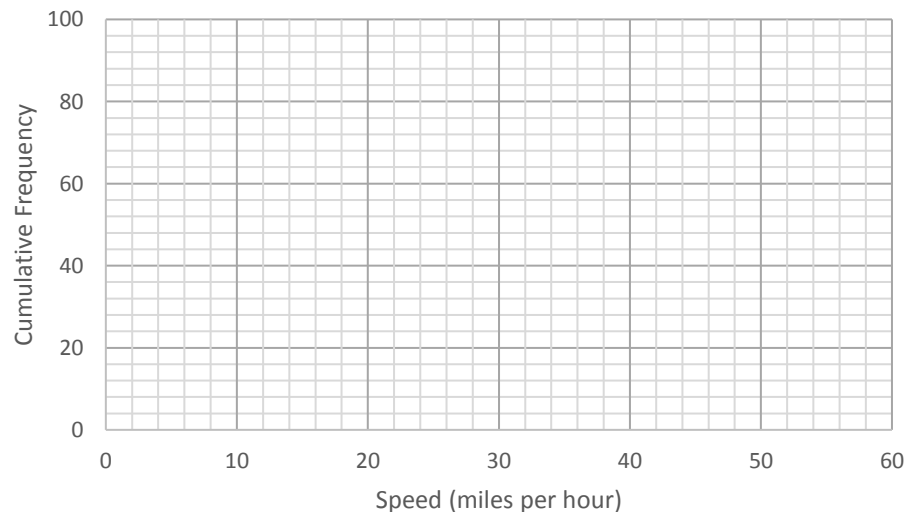


2.

The frequency table below shows the speeds of 100 cars recorded by a speed camera.

Speed (miles per hour)	Frequency	Cumulative frequency
$20 \leq x < 30$	76	
$30 \leq x < 40$	12	
$40 \leq x < 50$	8	
$50 \leq x < 60$	4	

Use the information to plot a cumulative frequency graph on the axis.



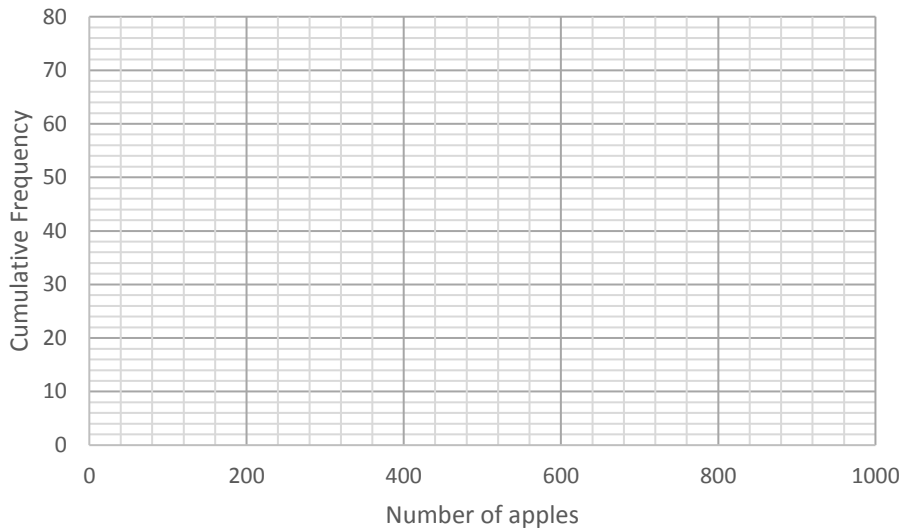
3.

The incomplete frequency table below shows the number of apples harvested from 80 apple trees in an orchard.

(a) Complete the frequency table.

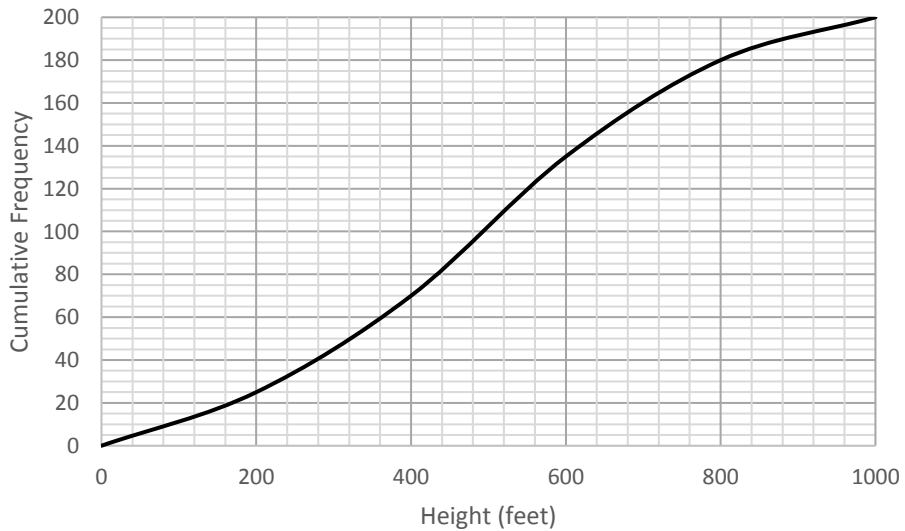
Number of apples	Frequency	Cumulative Frequency
$0 \leq x < 200$	8	
$200 \leq x < 400$		22
$400 \leq x < 600$	28	
$600 \leq x < 800$		76
$800 \leq x < 1000$		80

(b) Use the information to plot a cumulative frequency graph on the axis below.



4.

The cumulative frequency graph below shows the heights, in feet, of 200 oak trees.

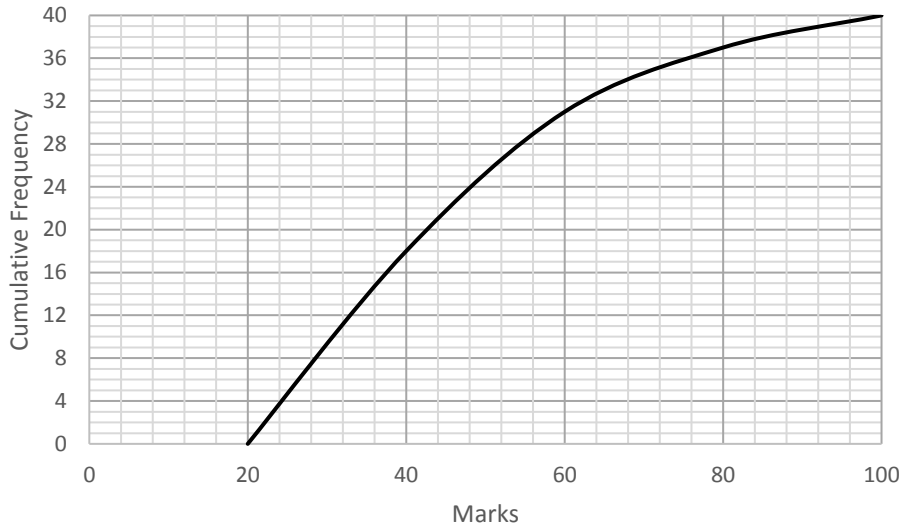


(a) Use the graph to estimate the median height.

(b) Use the graph to estimate the number of oak trees that are more than 600 feet tall.

5.

The cumulative frequency graph below shows the marks, out of 100, that a class scored in a maths test.



(a) Use the graph to estimate the median mark.

(b) Use the graph to estimate the interquartile range.

(c) The pass mark for the test was 40 out of 100.  
Estimate how many students failed the exam.

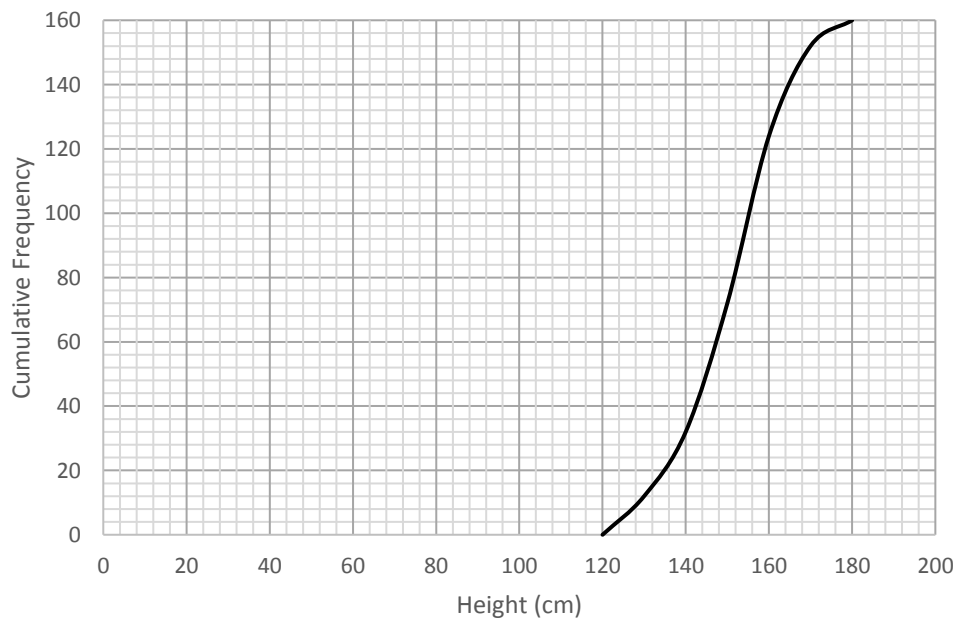
6.

The cumulative frequency graph below shows the heights of the Year 11s at a school.

(a) Use the graph to estimate the median height.

(b) Use the graph to estimate the lower quartile.

(c) Jimmy is in Year 10. He is 164 cm tall. Use the graph to estimate how many Year 11s Jimmy is taller than.

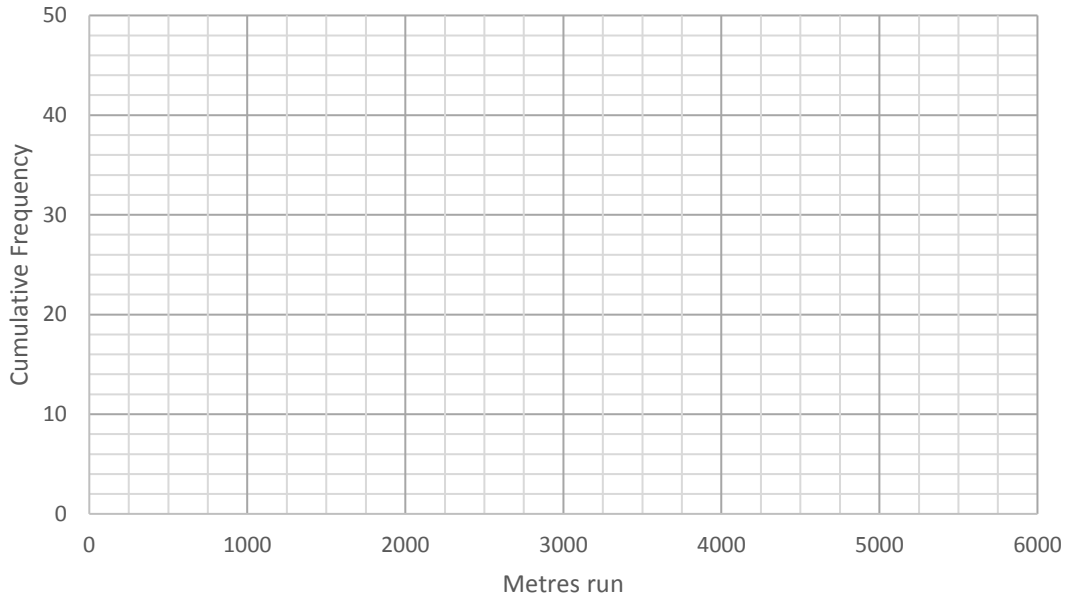


7.

Each member of a football team ran for 30 minutes on a treadmill.  
The frequency table below shows how many metres they ran.

<b>Metres ran</b>	<b>Frequency</b>
$3,500 \leq x < 4,000$	4
$4,000 \leq x < 4,500$	8
$4,500 \leq x < 5,000$	14
$5,000 \leq x < 5,500$	18
$5,500 \leq x < 6,000$	4

(a) Use the information to plot a cumulative frequency graph on the axis below.



(b) Use your graph to estimate the median metres run.

(c) Use your graph to estimate the interquartile range.

(d) Use your graph to estimate how many players ran between 4,250 and 5,250 metres.

(e) The coach ran 4,750 metres in 30 minutes.

Use your graph to estimate the number of players that ran further than the coach.

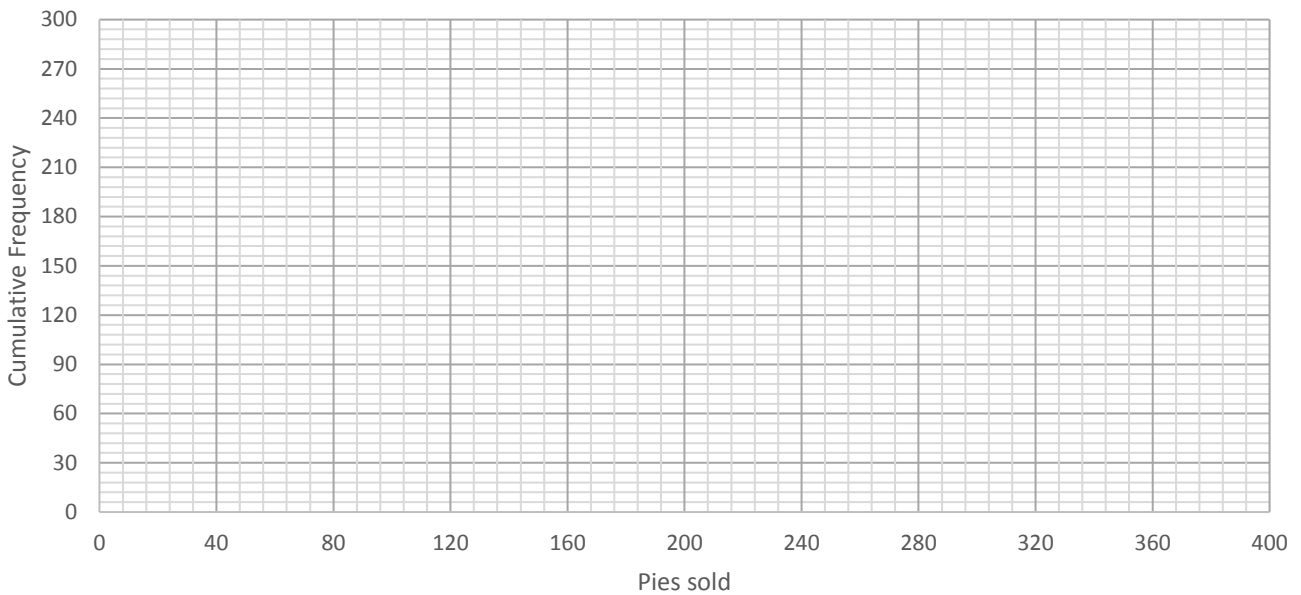
8.

Kenny runs a pie shop.

The frequency table below shows the number of pies sold at his shop over the last 300 days.

Number of pies sold	Frequency
$80 \leq x < 120$	36
$120 \leq x < 160$	54
$160 \leq x < 200$	84
$200 \leq x < 240$	60
$240 \leq x < 280$	48
$280 \leq x < 320$	18

(a) Use the information to plot a cumulative frequency graph on the axis below.



(b) Use your graph to estimate the median number of pies sold.

(c) Kenny needs to sell at least 176 pies each day in order to break even.

Use your graph to estimate the percentage of days in which Kenny broke even.

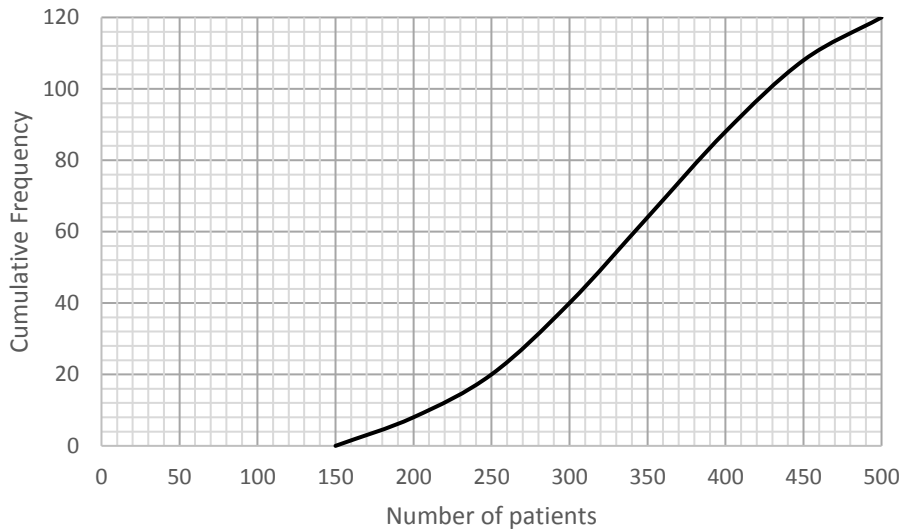
(d) Use your graph to estimate the number of days in which between 112 and 232 pies were sold.

(e) Kenny says “If I sell 210 pies in a day, that would be in the top 10%”.

Do you agree with Kenny? Explain your reasoning.

9.

The cumulative frequency graph below shows the daily number of patients at Sercombe Hospital over the past 120 days.



The frequency table below shows the daily number of patients at Leckwith Hospital over the same 120 days.

Number of patients	Frequency
$100 \leq x < 200$	24
$200 \leq x < 300$	32
$300 \leq x < 400$	44
$400 \leq x < 500$	20

(a) Plot the information for Leckwith Hospital on the same axis.

(b) Make **two** comparisons about the distributions of the daily number of patients at Sercombe Hospital and Leckwith Hospital.

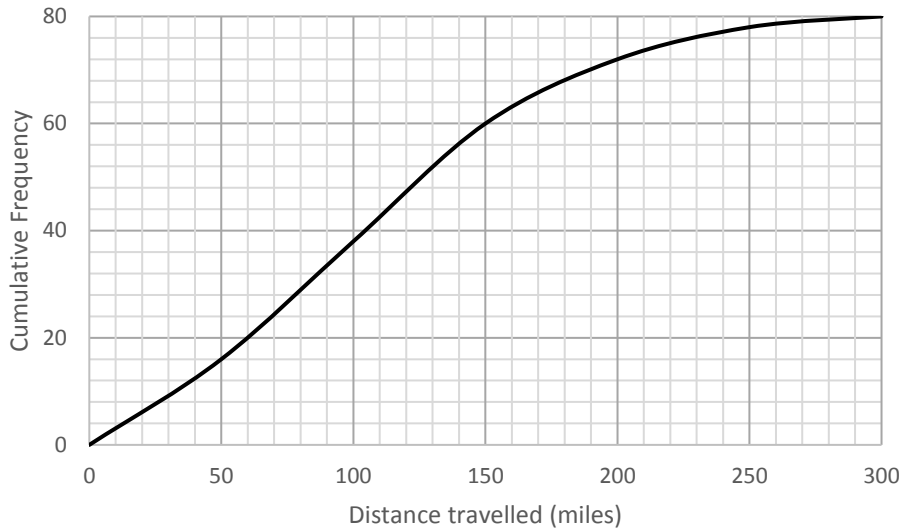
(c) Leckwith Hospital is planning to remove some of its hospital beds, reducing the number of beds available to 420.

Use your graph to estimate what percentage of the 120 days Leckwith Hospital had more than 420 patients.

(d) Sercombe Hospital had more than  $x$  patients in 20% of the last 120 days.

Use the graph to estimate  $x$ .

10.  
 Andrew is a salesman.  
 The cumulative frequency graph below shows the number of miles Andrew travelled in the last 80 working days.



Andrew’s wife, Beatrice, is also a salesperson.  
 The frequency table below shows the number of miles she travelled in the last 80 working days.

Distance travelled (miles)	Frequency
$0 \leq x < 60$	36
$60 \leq x < 120$	28
$120 \leq x < 180$	12
$180 \leq x < 240$	4

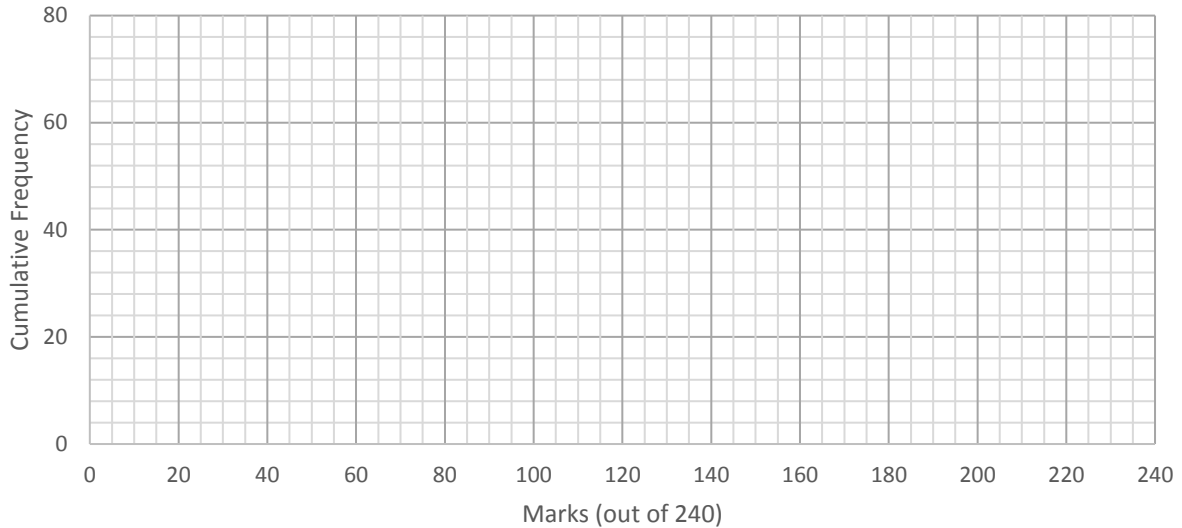
- (a) Plot the information for Beatrice on the same graph as Andrew.
- (b) Make **two** comparisons about the distributions of the number of miles travelled by Andrew and Beatrice.

(c) Andrew’s boss wants him to catch the train when he needs to travel over 200 miles, in order to save time.

Use the graph to estimate what percentage of days Andrew will be catching the train.

11.  
 The frequency table below shows the marks that 80 Year 11s scored in their higher tier mock GCSE exam.

Marks (out of 240)	Frequency
$30 \leq x < 60$	16
$60 \leq x < 90$	24
$90 \leq x < 120$	20
$120 \leq x < 150$	12
$150 \leq x < 180$	8



- (a) Use the information to plot a cumulative frequency graph.
- (b) Last year, 105 marks were required to achieve a Level 6. If that was used this year, use the graph to estimate how many of the students would achieve a Level 6.

The maths department are setting their own grade boundaries this year.

- (c) They want to set the boundary for a Level 5 so that 55% of their students achieve at least a Level 5.  
 Use the graph to estimate what mark they should choose to be the Level 5 grade boundary.

- (d) They want to set their boundary for a Level 8 so that 95% of their students do not achieve a Level 8.  
 Use the graph to estimate what mark they should choose to be the Level 8 grade boundary.