CUMULATIVE FREQUENCY GRAPHS

Pearson Edexcel - Tuesday 19 May 2020 - Paper 1 (Non-Calculation) Higher Tier

1.

12 The table gives information about the weekly wages of 80 people.

Wage (£w)	Frequency
$200 < w \leqslant 250$	5
$250 < w \leqslant 300$	10
$300 < w \leqslant 350$	20
$350 < w \leqslant 400$	20
$400 < w \leqslant 450$	15
$450 < w \leqslant 500$	10

(a) Complete the cumulative frequency table.

Wage (£w)	Cumulative frequency
$200 < w \leqslant 250$	
$200 < w \leqslant 300$	
$200 < w \leqslant 350$	
$200 < w \leqslant 400$	
$200 < w \leqslant 450$	
$200 < w \leqslant 500$	

(1)

(b) On the grid opposite, draw a cumulative frequency graph for your completed table.
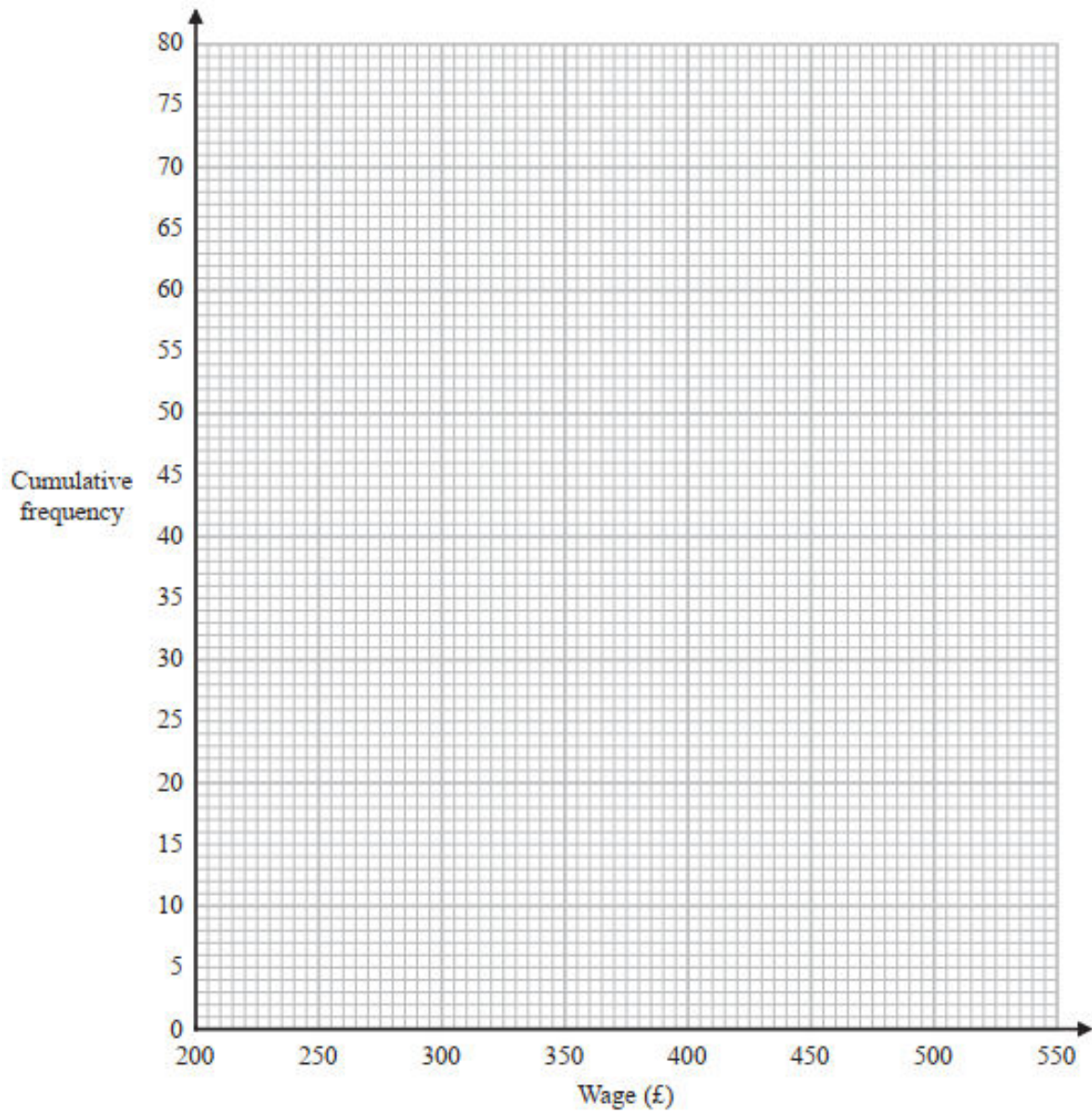
(2)

Juan says

"60% of this group of people have a weekly wage of £360 or less."

(c) Is Juan correct?
    You must show how you get your answer.

(Total for Question 12 is 6 marks)

Pearson Edexcel - Thursday 6 June 2019 - Paper 2 (Calculator) Higher Tier

2.

11 The grouped frequency table gives information about the times, in minutes, that 80 office workers take to get to work.
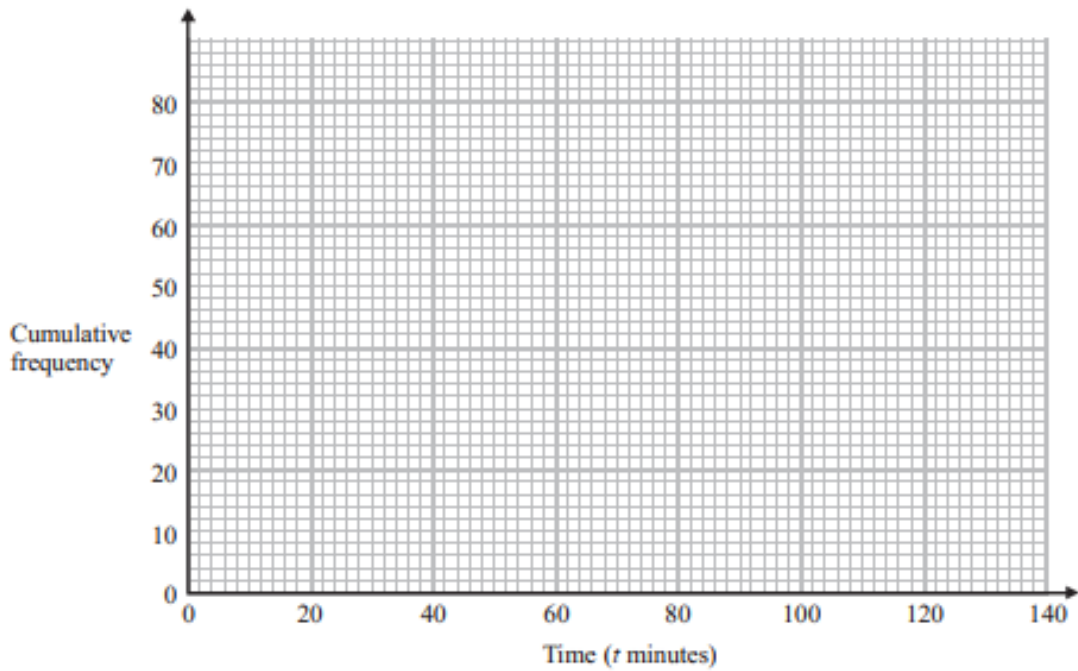
Time (*t* minutes)	Frequency
$0 < t \leqslant 20$	5
$20 < t \leqslant 40$	30
$40 < t \leqslant 60$	20
$60 < t \leqslant 80$	15
$80 < t \leqslant 100$	8
$100 < t \leqslant 120$	2

(a) Complete the cumulative frequency table.

Time (*t* minutes)	Cumulative frequency
$0 < t \leqslant 20$	
$0 < t \leqslant 40$	
$0 < t \leqslant 60$	
$0 < t \leqslant 80$	
$0 < t \leqslant 100$	
$0 < t \leqslant 120$	

(1)

(b) On the grid, draw the cumulative frequency graph for this information.

Time (*t* minutes)

(2)

(c) Use your graph to find an estimate for the percentage of these office workers who take more than 90 minutes to get to work.

....%

(3)

(Total for Question 11 is 6 marks)

Pearson Edexcel - Wednesday 5 November 2014 - Paper 1 (Non-Calculator) Higher Tier

3.

16 There are 200 workers at a factory.

The cumulative frequency table gives information about their ages.

Age (a years)	Cumulative frequency
$0 < a \leqslant 20$	25
$0 < a \leqslant 30$	70
$0 < a \leqslant 40$	138
$0 < a \leqslant 50$	175
$0 < a \leqslant 60$	186
$0 < a \leqslant 70$	194
$0 < a \leqslant 80$	200

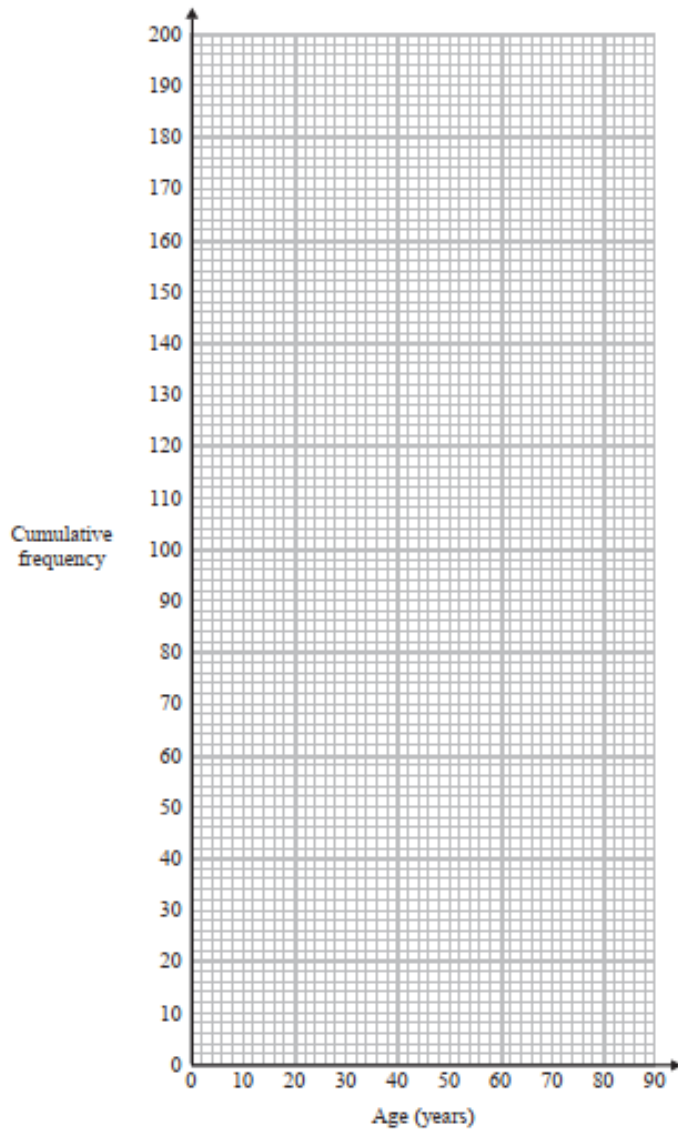(a) On the grid opposite, draw a cumulative frequency graph for this information.

(2)

(b) Graham says,

"10% of workers at the factory are older than 65"

Is Graham correct?
You must show how you get your answer.

....

....

....

....

(2)

Pearson Edexcel - Tuesday 11 June 2013 - Paper 1 (Non-Calculator) Higher Tier

4.

21 The table below shows information about the heights of 60 students.

Height (x cm)	Number of students
$140 < x \leqslant 150$	4
$150 < x \leqslant 160$	5
$160 < x \leqslant 170$	16
$170 < x \leqslant 180$	27
$180 < x \leqslant 190$	5
$190 < x \leqslant 200$	3

(a) On the grid opposite, draw a cumulative frequency graph
for the information in the table.

(3)
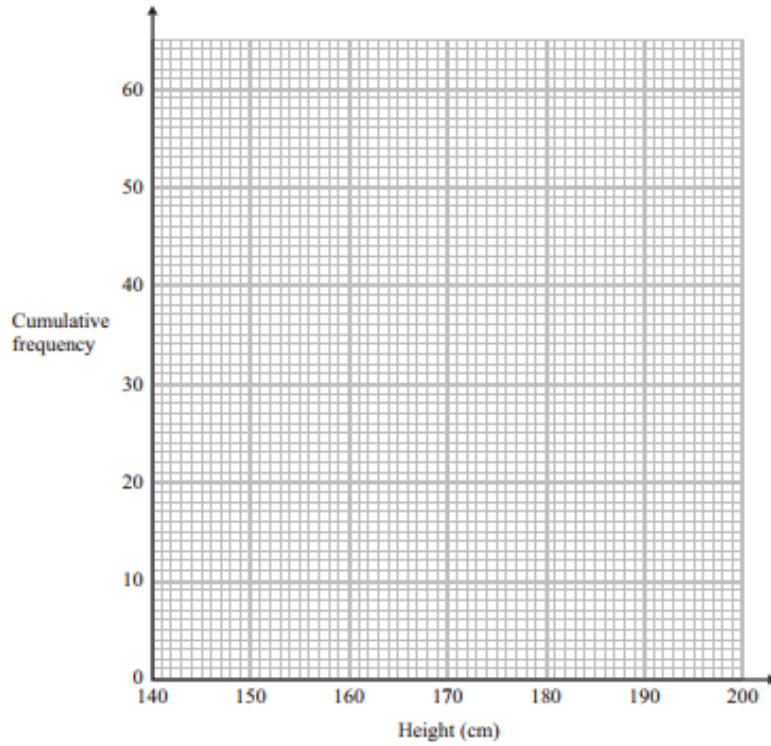
(b) Find an estimate

(i) for the median,

.... cm

(ii) for the interquartile range.

.... cm

(3)

(Total for Question 21 is 6 marks)

Pearson Edexcel - Thursday 28 February 2013 - Paper 1 (Non-Calculator) Higher Tier

5.

14 The grouped frequency table shows information about the weekly wages of 80 factory workers.

Weekly wage (£x)	Frequency
$100 < x \leqslant 200$	8
$200 < x \leqslant 300$	15
$300 < x \leqslant 400$	30
$400 < x \leqslant 500$	17
$500 < x \leqslant 600$	7
$600 < x \leqslant 700$	3

(a) Complete the cumulative frequency table.

Weekly wage (£x)	Cumulative Frequency
$100 < x \leqslant 200$	
$100 < x \leqslant 300$	
$100 < x \leqslant 400$	
$100 < x \leqslant 500$	
$100 < x \leqslant 600$	
$100 < x \leqslant 700$	

(1)

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

(2)

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

£ ....

(2)

(d) Use your graph to find an estimate for the number of workers with a weekly wage of more than £530

....

(2)

Cumulative frequency graph with "Cumulative frequency" on the vertical axis (marked 0, 10, 20, 30, 40, 50, 60, 70, 80) and "Weekly wage (£)" on the horizontal axis (marked 0, 100, 200, 300, 400, 500, 600, 700).
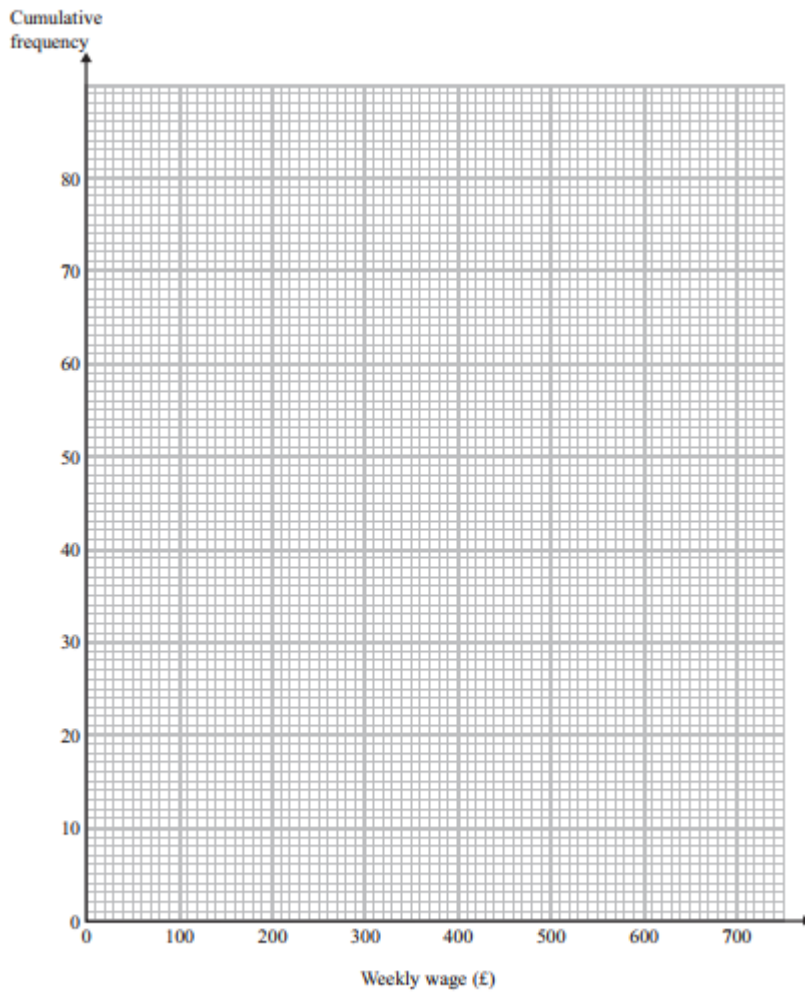
(Total for Question 14 is 7 marks)

Pearson Edexcel - Tuesday 6 November 2012 - Paper 1 (Non-Calculator) Higher Tier

6.

21 The table shows information about the speeds of 100 lorries.

Speed (s) in km/h	Frequency
$0 < s \leqslant 20$	2
$20 < s \leqslant 40$	9
$40 < s \leqslant 60$	23
$60 < s \leqslant 80$	31
$80 < s \leqslant 100$	27
$100 < s \leqslant 120$	8

(a) Complete the cumulative frequency table for this information.

Speed (s) in km/h	Cumulative frequency
$0 < s \leqslant 20$	2
$0 < s \leqslant 40$	
$0 < s \leqslant 60$	
$0 < s \leqslant 80$	
$0 < s \leqslant 100$	
$0 < s \leqslant 120$	

(1)

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

(2)

Speed (*s*) in km/h
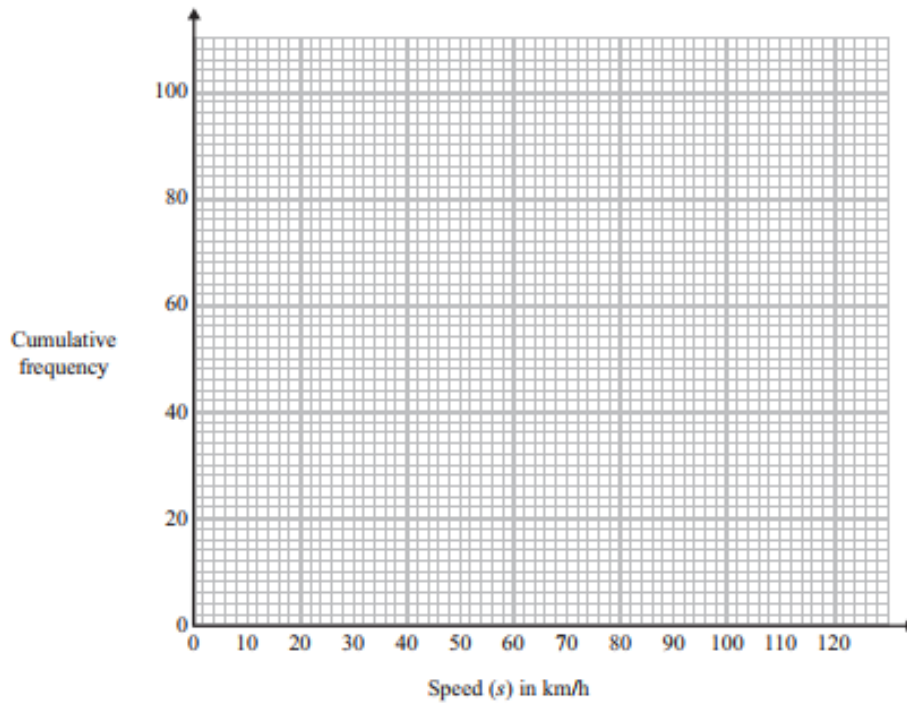
(c) Find an estimate for the number of lorries with a speed of more than 90 km/h.

....

(2)

(Total for Question 21 is 5 marks)

Pearson Edexcel - Monday 5 March 2012 - Paper 4 (Calculator) Higher Tier

7.

16. This frequency table gives information about the ages of 60 teachers.

Age (A) in years	Frequency
20 < A ⩽ 30	12
30 < A ⩽ 40	15
40 < A ⩽ 50	18
50 < A ⩽ 60	12
60 < A ⩽ 70	3

(a) Complete the cumulative frequency table.

Age (A) in years	Cumulative frequency
20 < A ⩽ 30	
20 < A ⩽ 40	
20 < A ⩽ 50	
20 < A ⩽ 60	
20 < A ⩽ 70	

(1)

(b) On the grid opposite, draw a cumulative frequency graph for this information.

(2)

(c) Use your cumulative frequency graph to find an estimate for the median age.

.... years

(2)

(d) Use your cumulative frequency graph to find an estimate for
the number of teachers older than 55 years.

....

(2)

Cumulative Frequency

Age (A) in years
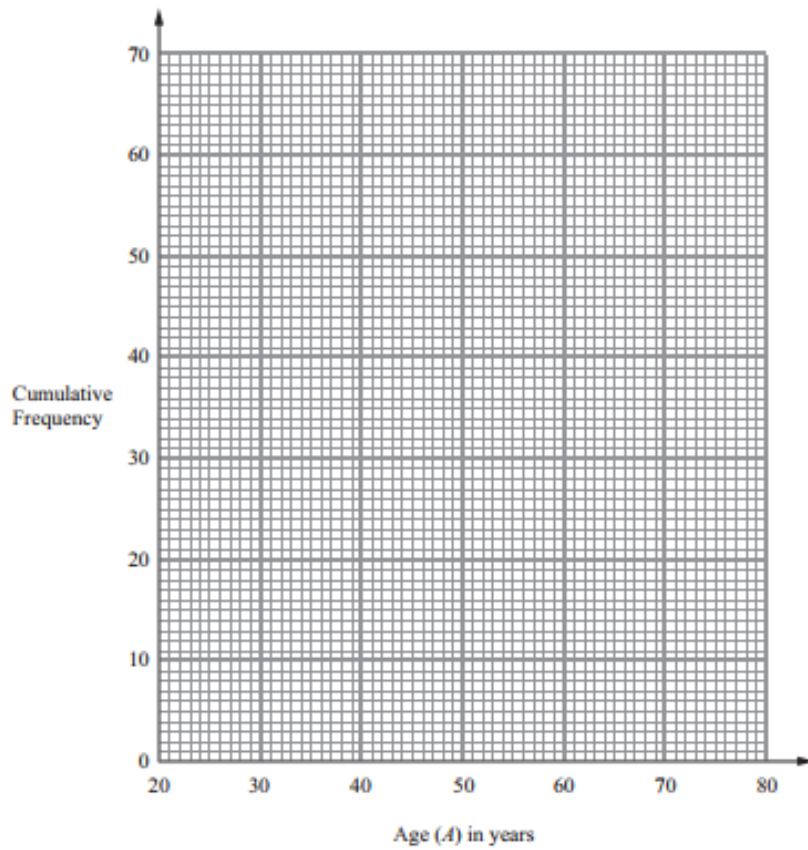
(Total 7 marks)

Pearson Edexcel - Wednesday 9 November 2011 - Paper 3 (Non-Calculator) Higher Tier

8.

15. A garage keeps records of the costs of repairs to customers' cars.

The table gives information about these costs for one month.

Cost (£C)	Frequency
$0 < C \leqslant 200$	7
$200 < C \leqslant 400$	11
$400 < C \leqslant 600$	9
$600 < C \leqslant 800$	10
$800 < C \leqslant 1000$	8
$1000 < C \leqslant 1200$	5

(a) Write down the modal class interval.

....
(1)

(b) Complete the cumulative frequency table.

Cost (£C)	Cumulative Frequency
$0 < C \leqslant 200$	
$0 < C \leqslant 400$	
$0 < C \leqslant 600$	
$0 < C \leqslant 800$	
$0 < C \leqslant 1000$	
$0 < C \leqslant 1200$	

(1)

(c) On the grid, draw a cumulative frequency diagram for your table.
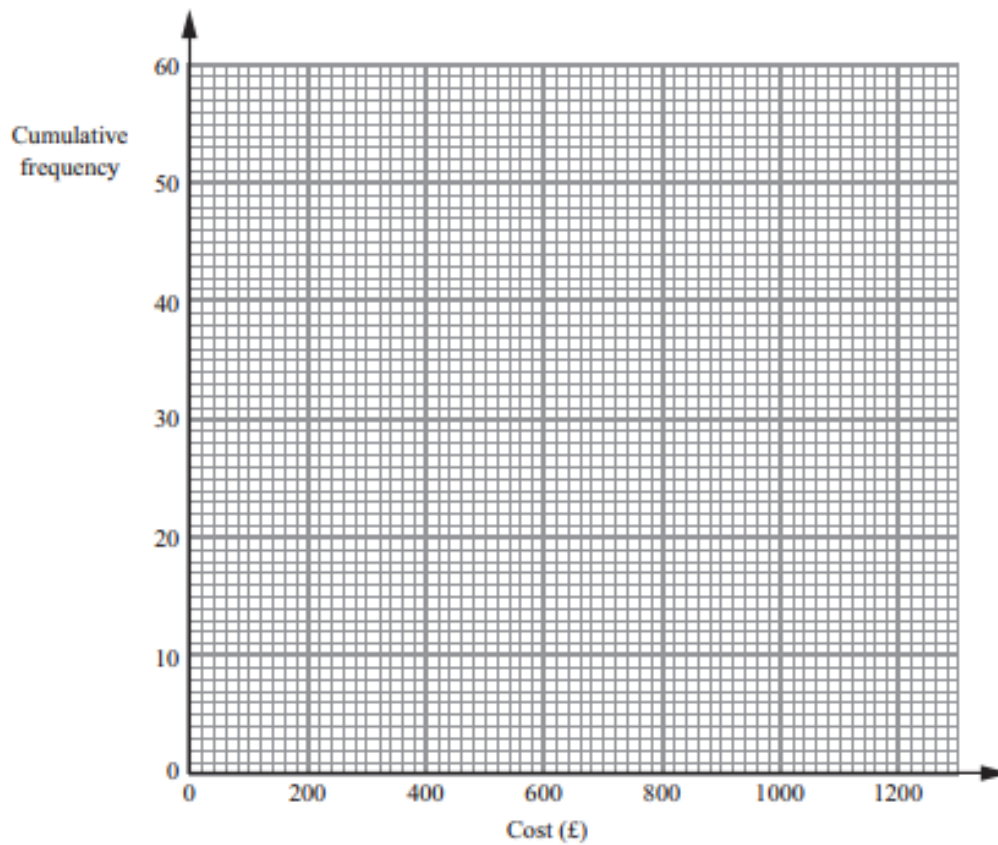
(2)

(d) Use the graph to find an estimate for the number of repairs which cost more than £700

....
(2)

(Total 6 marks)

Pearson Edexcel - Monday 6 June 2011 - Paper 3 (Non-Calculator) Higher Tier

9.

18. The table shows information about the time, m minutes, it takes to show each of 120 films.

Time (m minutes)	Frequency
$70 < m \leqslant 80$	4
$80 < m \leqslant 90$	12
$90 < m \leqslant 100$	34
$100 < m \leqslant 110$	32
$110 < m \leqslant 120$	26
$120 < m \leqslant 130$	12

(a) Write down the modal class interval.

....
(1)

(b) Complete the cumulative frequency table.

Time (m minutes)	Cumulative frequency
$70 < m \leqslant 80$	4
$70 < m \leqslant 90$	
$70 < m \leqslant 100$	
$70 < m \leqslant 110$	
$70 < m \leqslant 120$	
$70 < m \leqslant 130$	

(1)

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

Time (*m* minutes)

(2)
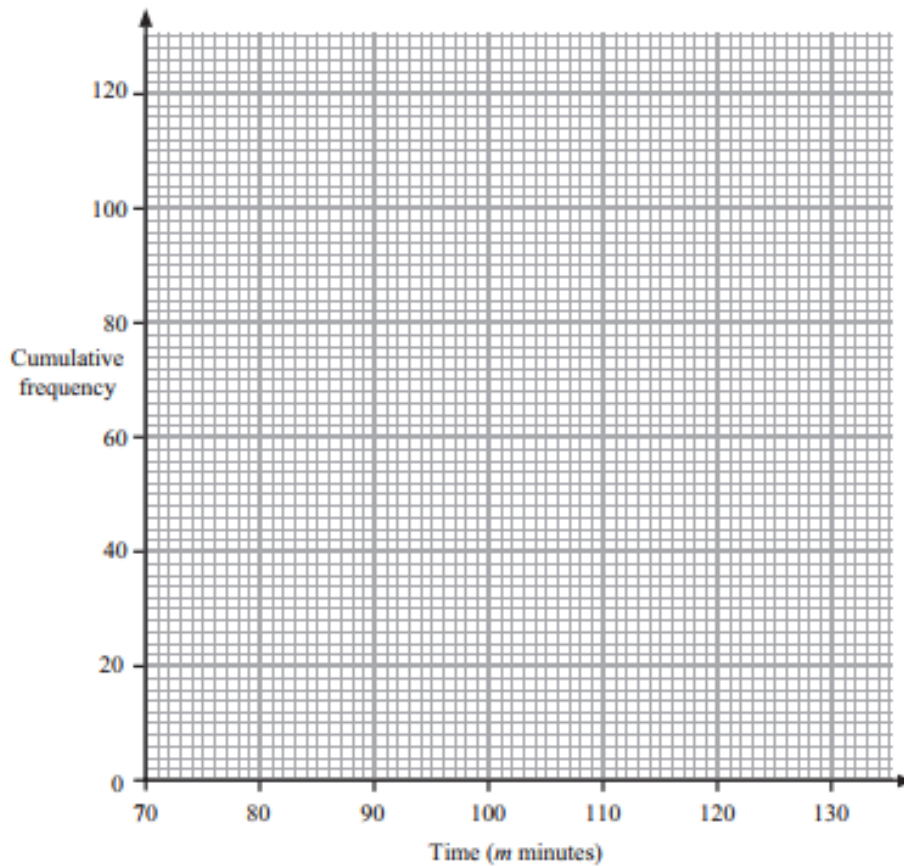
(d) Use your graph to find an estimate for the median.

.... minutes

(1)

(Total 5 marks)

Pearson Edexcel - Friday 12 November 2010 - Paper 4 (Calculator) Higher Tier

10.

19. There are 100 teachers at Maria's school.
   Maria found out the age of each teacher.

   The table gives information about her results.

Age (A years)	Frequency
$20 < A \leqslant 30$	26
$30 < A \leqslant 40$	35
$40 < A \leqslant 50$	21
$50 < A \leqslant 60$	12
$60 < A \leqslant 70$	6

(a) Complete the cumulative frequency table.

Age (A years)	Cumulative Frequency
$20 < A \leqslant 30$	26
$20 < A \leqslant 40$	
$20 < A \leqslant 50$	
$20 < A \leqslant 60$	
$20 < A \leqslant 70$	

(1)

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

(2)

(c) Use your graph to find an estimate for the median age.

.... years
(1)

(d) Use your graph to find an estimate for the number of these teachers
   who are **older** than 56 years old.

....
(2)

Cumulative frequency

Age (A years)
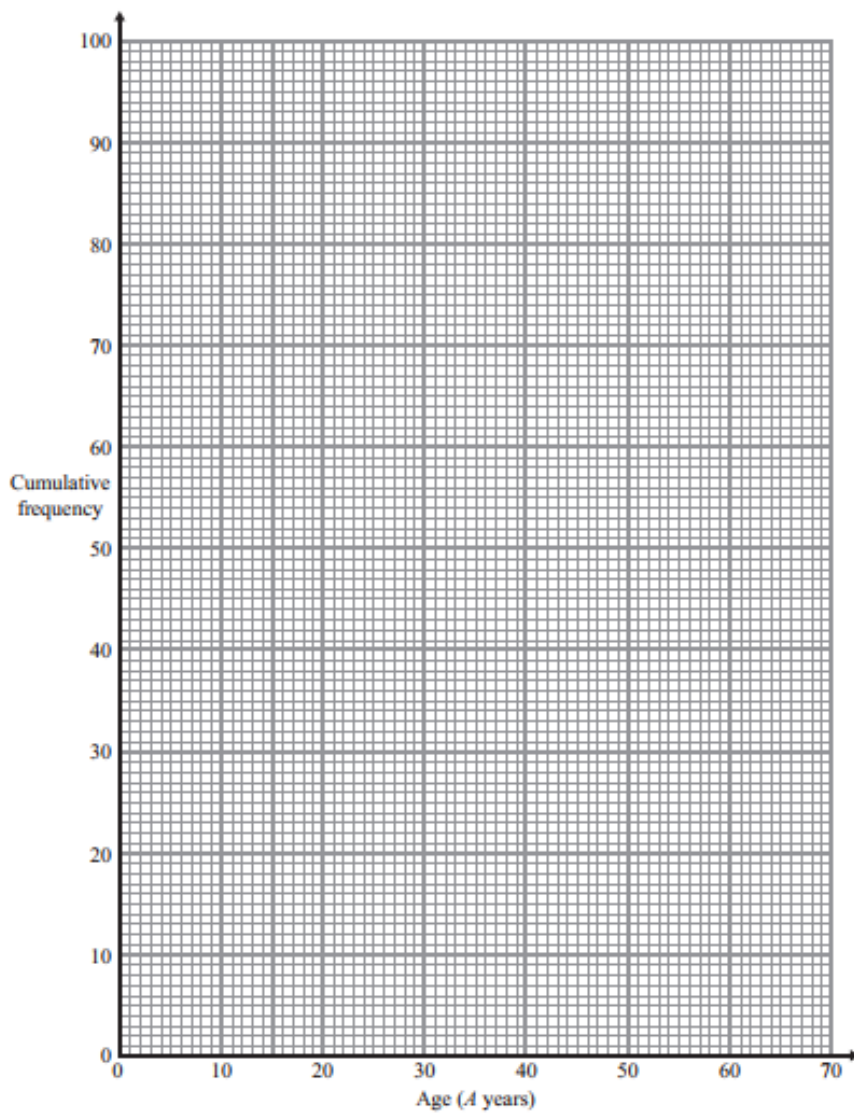
(Total 6 marks)

Pearson Edexcel - Monday 7 June 2010 - Paper 3 (Non-Calculator) Higher Tier

11.

22. The table gives some information about the delays, in minutes, of 80 flights.

Delay (n minutes)	Frequency
$0 < n \leqslant 20$	16
$20 < n \leqslant 30$	26
$30 < n \leqslant 40$	23
$40 < n \leqslant 50$	10
$50 < n \leqslant 60$	5

(a) Write down the modal class interval.

....

(1)

(b) Complete the cumulative frequency table.

Delay (n minutes)	Cumulative Frequency
$0 < n \leqslant 20$	
$0 < n \leqslant 30$	
$0 < n \leqslant 40$	
$0 < n \leqslant 50$	
$0 < n \leqslant 60$	

(1)

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

(2)

(d) Use your graph to find an estimate for

    (i) the median delay,

.... minutes

    (ii) the interquartile range of the delays.

.... minutes

(3)

Cumulative frequency graph with y-axis labelled "Cumulative frequency" (0 to 80) and x-axis labelled "Delay (n minutes)" (0 to 60).
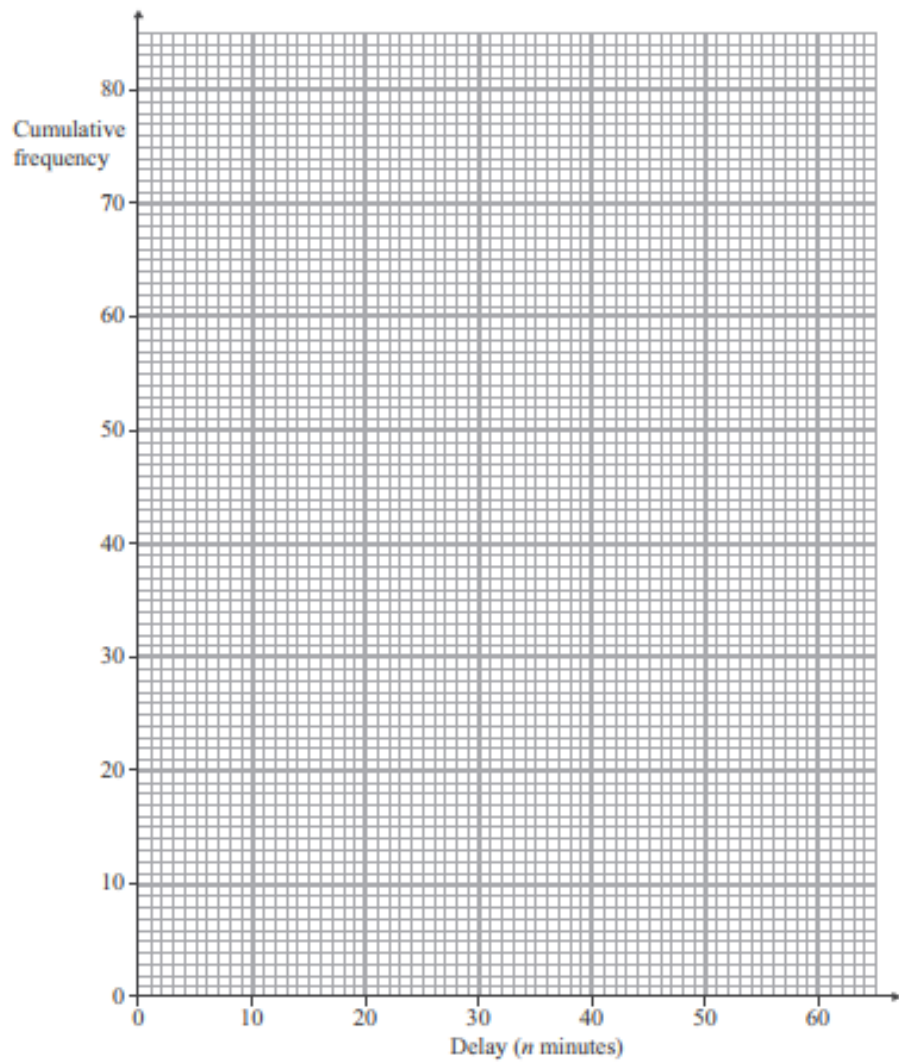
(Total 7 marks)

15 The cumulative frequency graph shows information about the marks scored by a group of 80 students in a test.
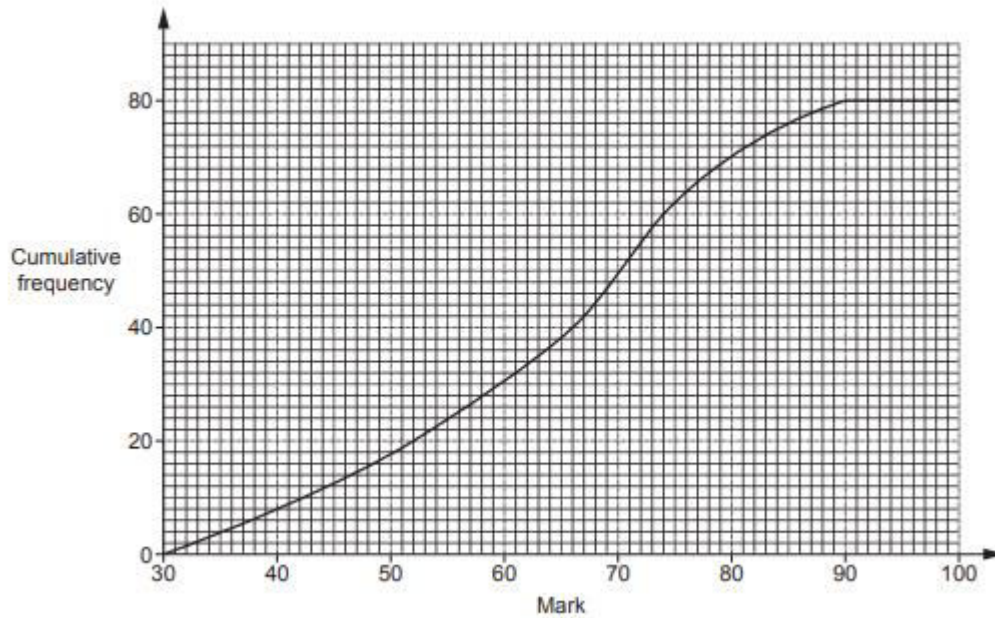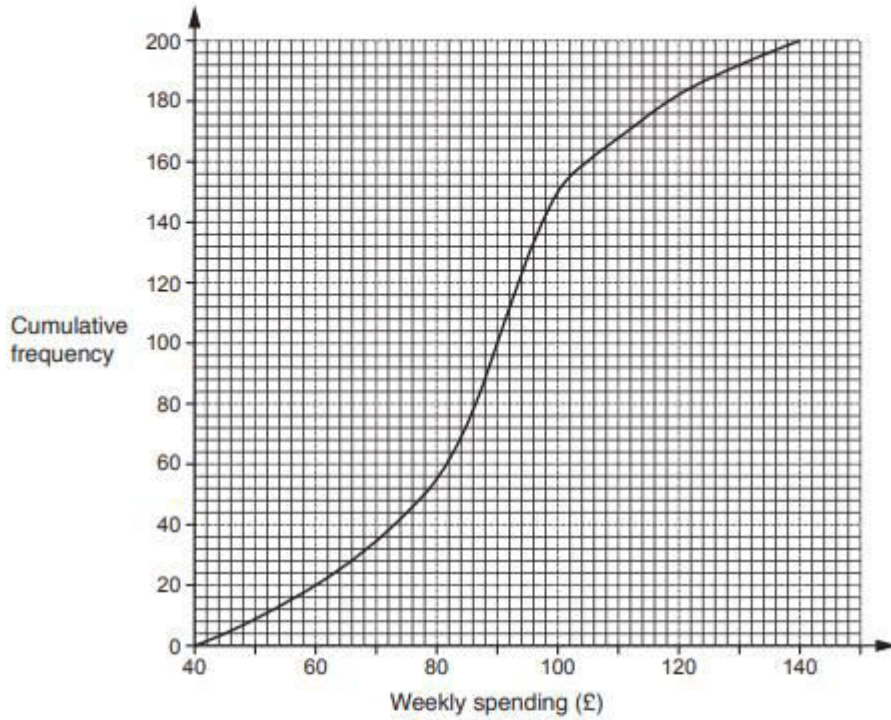

(a) Find the interquartile range.

(a) .... **[2]**

(b) The ratio of the number of students passing the test compared to failing the test is 4 : 1. Find the minimum mark needed to pass the test.

(b) .... **[3]**

15 Iqrah carries out a survey of 200 families in the **north** of England on their weekly spending on food.
The cumulative frequency diagram summarises the results.

(a) Find

    (i) the median,

                                                     (a)(i) £ .... **[1]**

    (ii) the interquartile range.

                                                     (ii) £ .... **[2]**

(b) Iqrah says

> 15% of these families spent over £120.

Is her statement correct?
State the evidence you have used in making your decision.

....

.... **[2]**

(c) In a survey of 200 families in the **south** of England, the median weekly amount spent on food
was £84 and the interquartile range was £28.

Make two comparisons between the weekly amounts spent on food in the north of England
and the south of England.
State the evidence you have used in making your comparisons.

1 ....

.... **[2]**

2 ....

.... **[2]**

14.

10 This graph shows the world population, in billions, between 1951 and 2015.
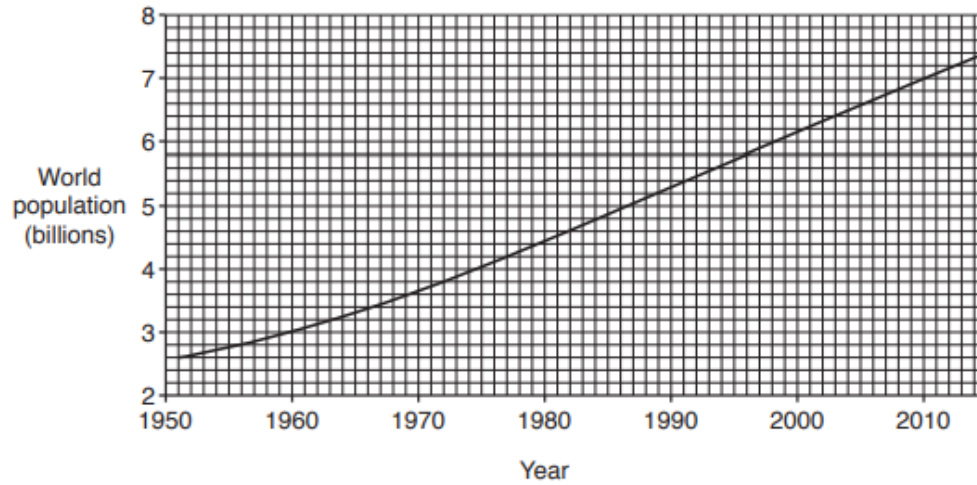
Use the graph to estimate the average rate of growth of the world population between 1951 and 2015.
Give suitable units for your answer.

.... **[3]**

15.

12 The cumulative frequency graph shows the speeds, in miles per hour (mph), of vehicles passing a 40 mph speed limit sign on a road.
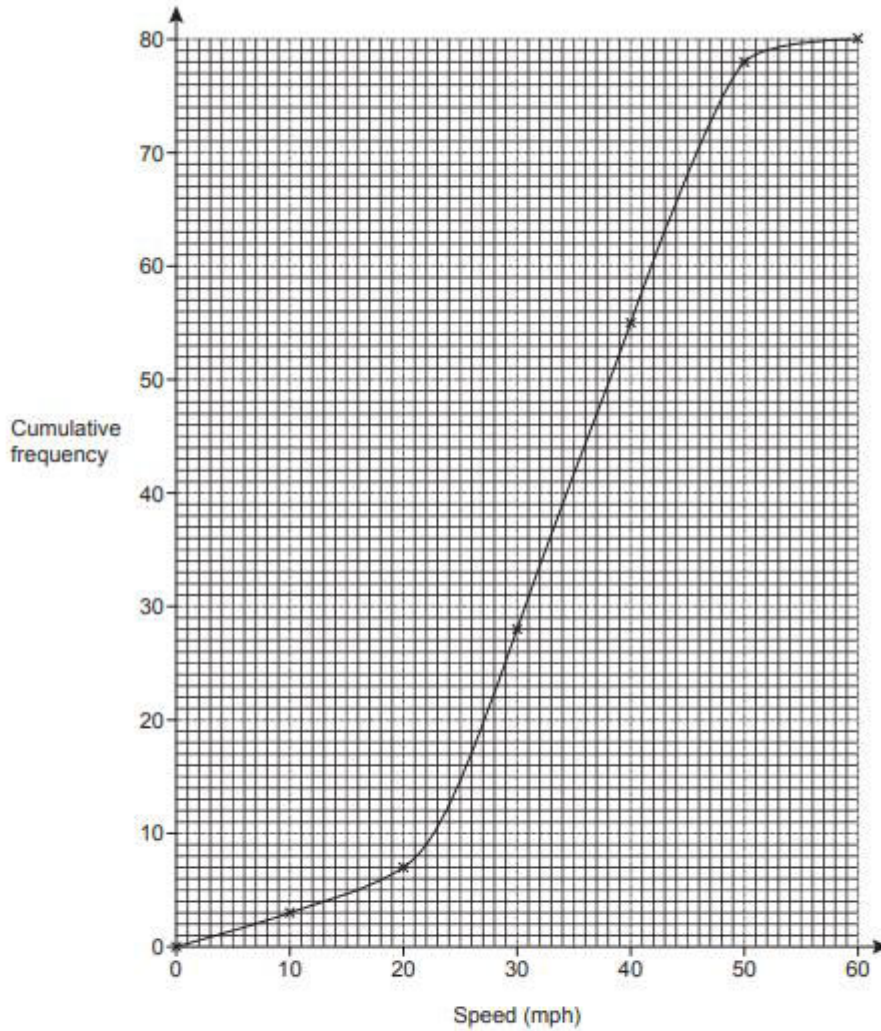
A speed camera will be installed if more than 30% of vehicles go over the speed limit of 40 mph.

Use information from the graph to decide if a speed camera should be installed. [4]

16.

14 The table shows the marks gained by 150 students taking an examination.

Mark (m)	0<m≤10	10<m≤20	20<m≤30	30<m≤40	40<m≤50	50<m≤60	60<m≤70	70<m≤80
Frequency	9	14	26	27	25	22	17	10

(a) (i) Construct a cumulative frequency table.

Mark (m)	m ≤ 10	m ≤ 20	m ≤ 30	m ≤ 40	m ≤ 50	m ≤ 60	m ≤ 70	m ≤ 80
Cumulative Frequency	9							150

[2]

(ii) Draw the cumulative frequency graph on the grid below.
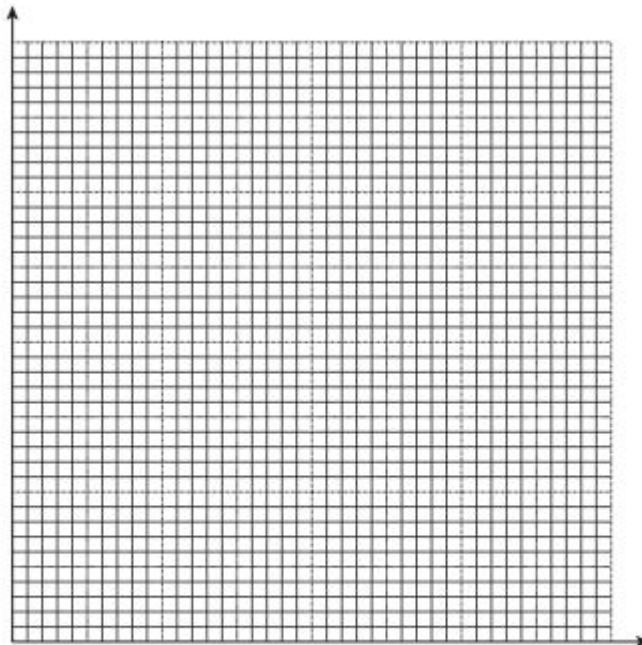
[4]

(b) Students are to be awarded Gold, Silver, Bronze or Fail.
The students' teacher wishes to award the top 10% of students Gold, the next 60% Silver and the next 20% Bronze.

Use your graph to estimate the lowest mark that Silver will be awarded for.

(b) .... [3]

(c) Explain why the teacher's method will not necessarily award Gold to exactly 10% of the students.

....

.... [1]

17   The cumulative frequency graph shows information about the masses of 200 apples.

Mass, grams
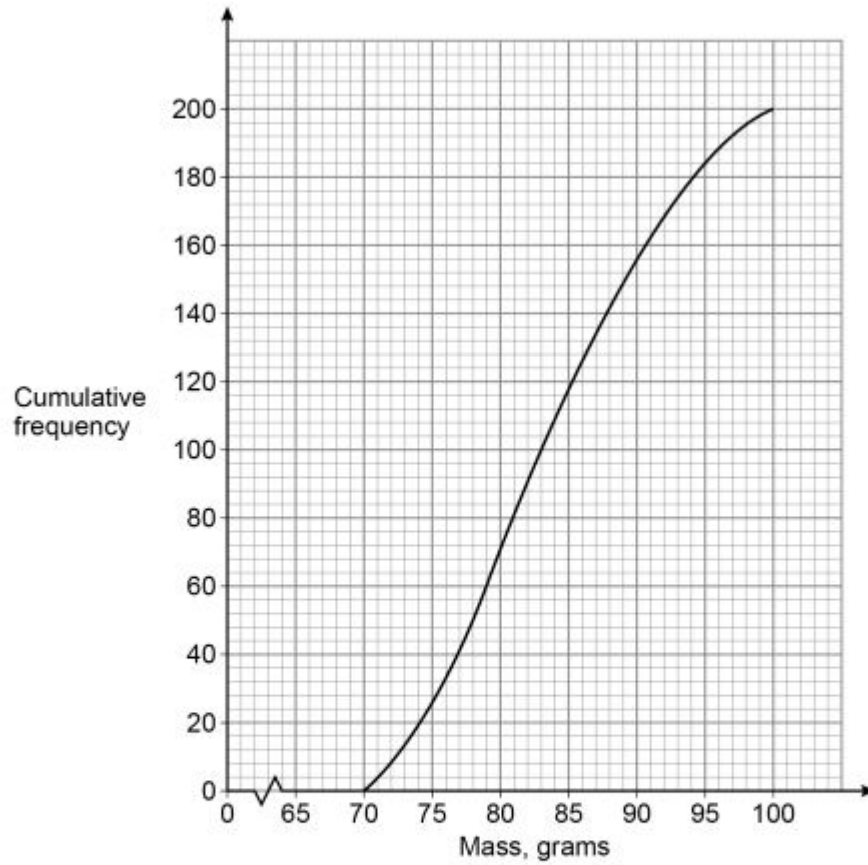
17 (a)   Estimate the median mass.

[1 mark]

Answer _____ grams

17 (b)   Apples with mass 90 grams or less cost 32p each.

Apples with mass more than 90 grams cost 39p each.

Estimate the **total** cost of the 200 apples.

_____

_____

_____

_____

_____

Answer   £ _____

15   Here is some information about the test marks of 120 students.

Mark, m	$0 < m \leqslant 10$	$10 < m \leqslant 20$	$20 < m \leqslant 30$	$30 < m \leqslant 40$	$40 < m \leqslant 50$
Frequency	20	28	40	20	12

15 (a)   Complete the cumulative frequency table.

[1 mark]

Mark, m	$m \leqslant 10$	$m \leqslant 20$	$m \leqslant 30$	$m \leqslant 40$	$m \leqslant 50$
Cumulative frequency	20	48			

15 (b)   Draw a cumulative frequency graph.

[2 marks]
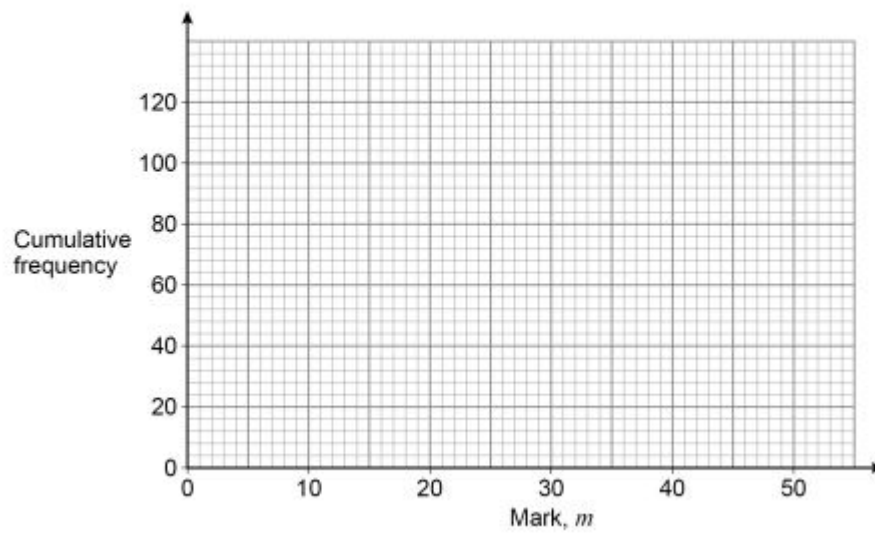
15 (c) Students who scored 15 marks or fewer take another test.

Use your graph to estimate how many students take another test.

[2 marks]

_____

_____

Answer _____

25   A sample of 50 eggs is taken from Farm A.
The table shows information about the masses of the eggs from Farm A.

Farm A

Mass, m (grams)	Frequency
$53 < m \leqslant 58$	8
$58 < m \leqslant 63$	19
$63 < m \leqslant 68$	15
$68 < m \leqslant 73$	8

A sample of 50 eggs is taken from Farm B.
The histogram shows information about the masses of the eggs from Farm B.
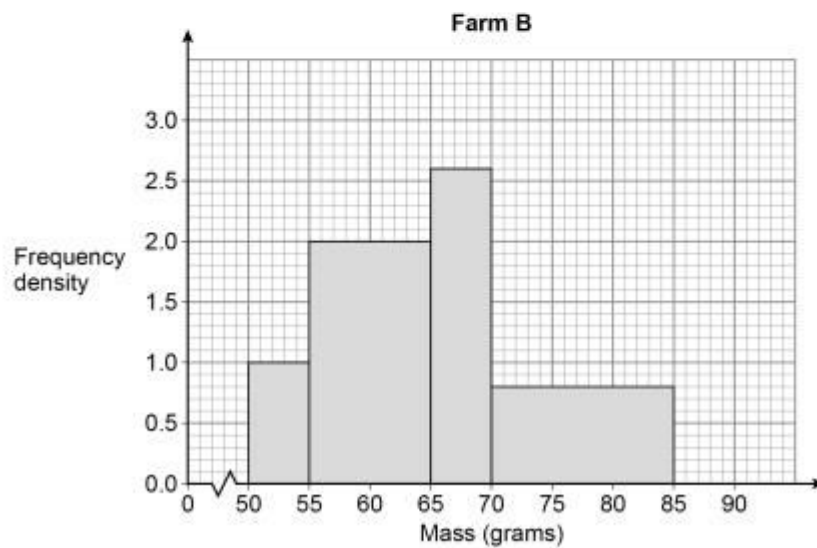
Farm B

For medium eggs,   53 g < mass ⩽ 63 g

The Farm A sample has more medium eggs than the Farm B sample.

Using the table and the histogram, estimate how many more.

You **must** show your working.

[4 marks]

_____

_____

_____

_____

_____

Answer _____

16   The cumulative frequency graph shows information about the masses of 50 apples.
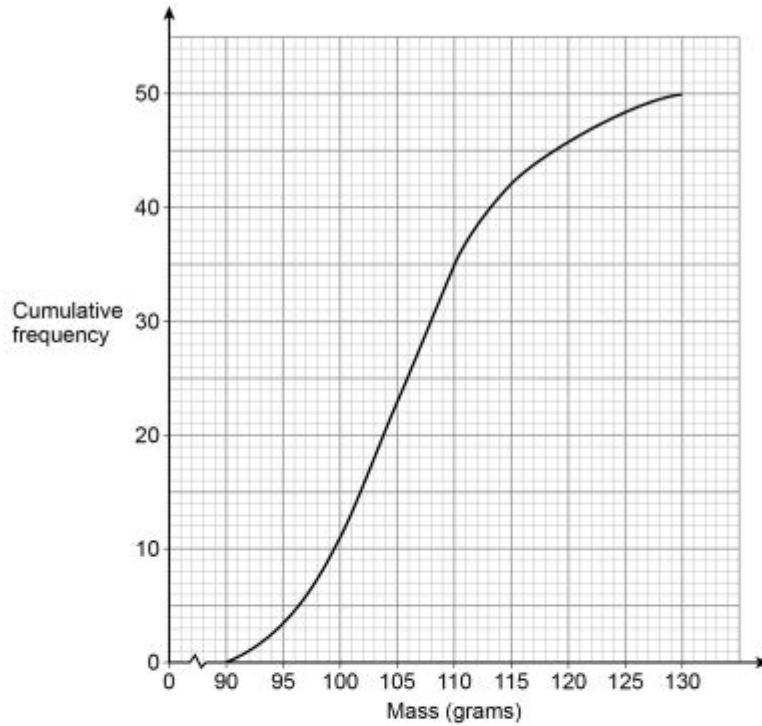
16 (a)   Use the graph to estimate the median mass of the apples.

[1 mark]

Answer _____ grams

16 (b)   Estimate the proportion of the apples that have a mass greater than 115 grams.

[2 marks]

_____

_____

Answer _____

19   Type A batteries and type B batteries were tested.
The cumulative frequency diagram shows information about the battery life of type A.
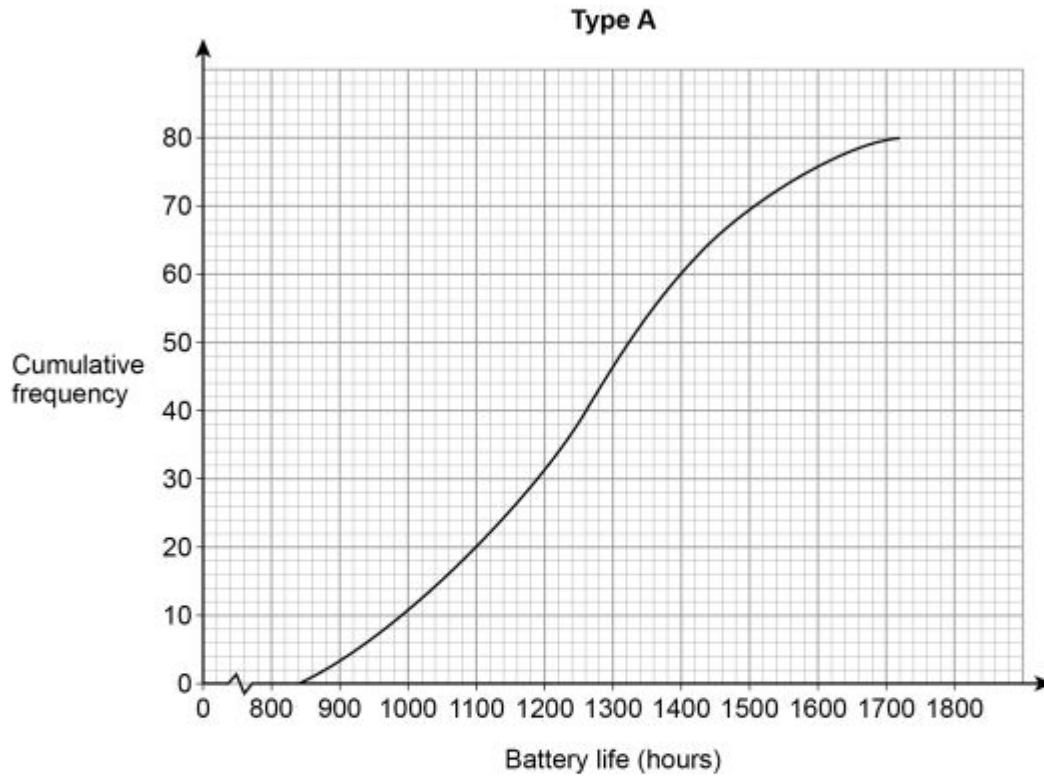
Type A

19 (a)   Estimate the interquartile range for type A.

[2 marks]

_____

_____

Answer _____ hours

19 (b)   Estimate the number of type A batteries that had a battery life of more than 1600 hours.

[1 mark]

_____

_____

Answer _____

19 (c)   The box plot shows information about the battery life of type B.

Type B
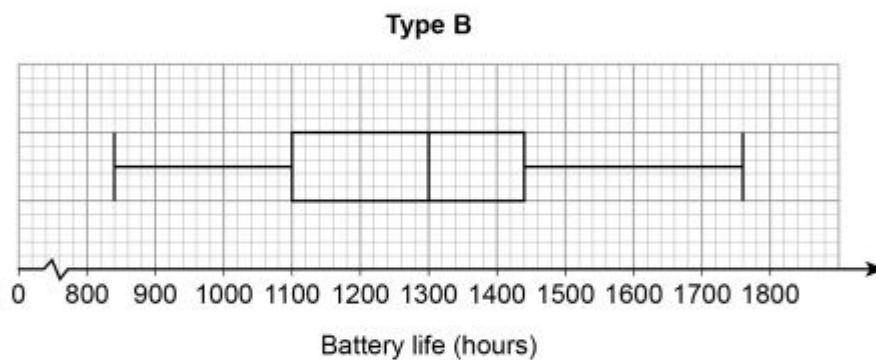
Battery life (hours)

On average, which type had the greater battery life?
Tick a box.

☐ type A   ☐ type B

Using data from **both** diagrams, state how you chose your answer.

[2 marks]

_____

_____

_____

22   Here is some information about the miles per gallon of 60 cars.

Miles per gallon, x	Frequency		
$40 < x \leqslant 50$	6		
$50 < x \leqslant 60$	16		
$60 < x \leqslant 70$	28		
$70 < x \leqslant 80$	10		

22 (a)   Draw a cumulative frequency graph.
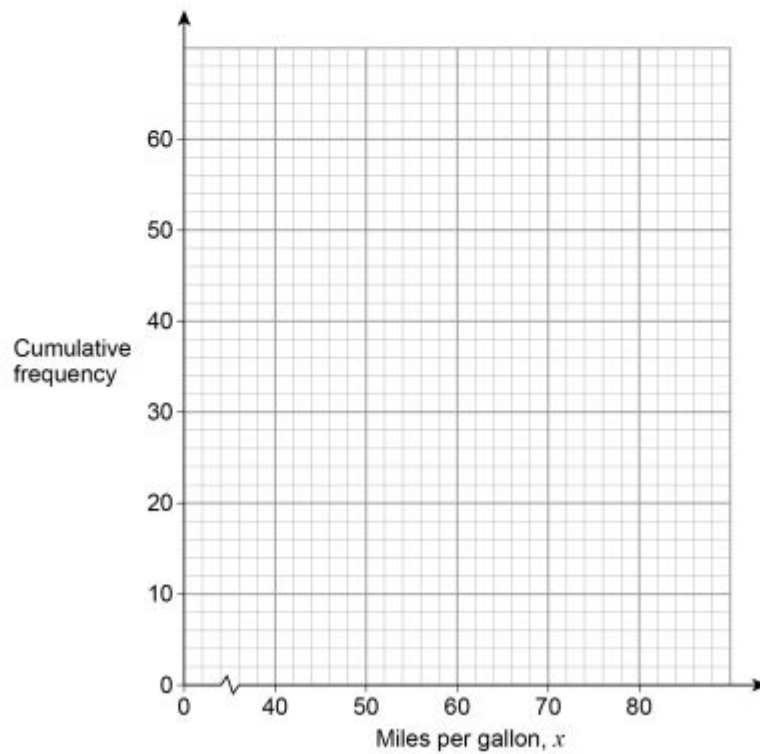
[3 marks]

22 (b)   Use the graph to work out the interquartile range.

[2 marks]

_____

_____

_____

Answer _____ miles per gallon
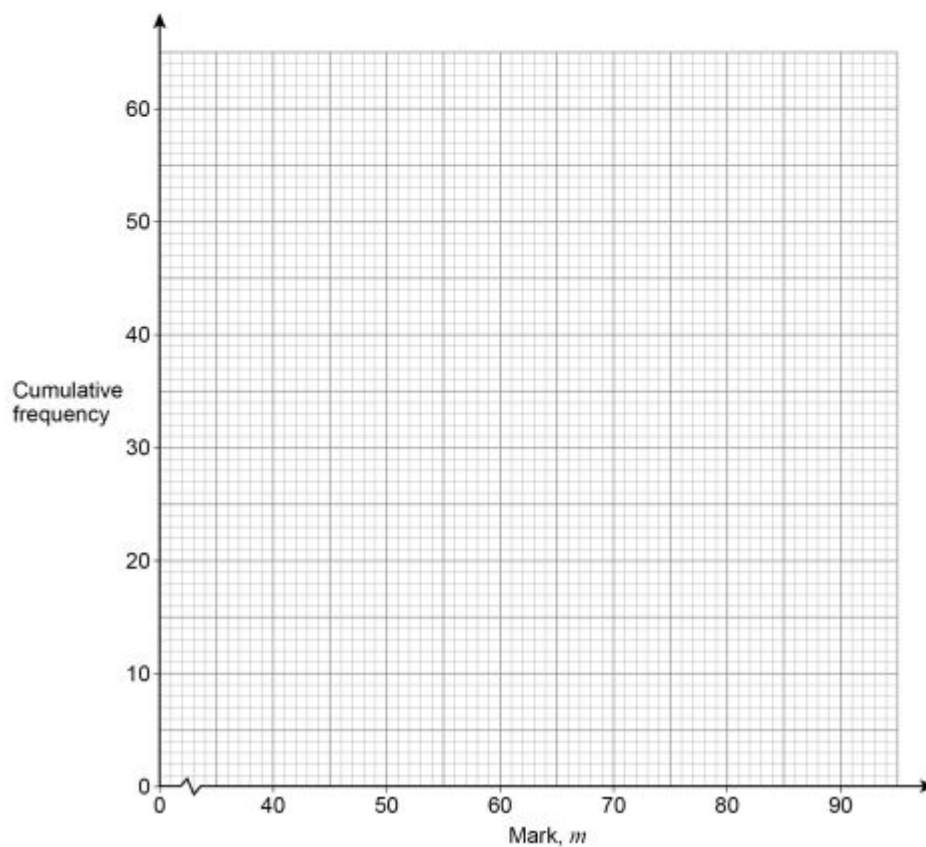
AQA GSCE – Wednesday 25 May 2017 – Paper 1 (Non - Calculator) Higher Tier

23.

19 Here is some information about the marks of 60 students in a test.

Mark, m	Frequency		
$40 < m \leqslant 50$	9		
$50 < m \leqslant 60$	16		
$60 < m \leqslant 70$	20		
$70 < m \leqslant 80$	8		
$80 < m \leqslant 90$	7		

19 (a) On the grid, draw a cumulative frequency graph.

[3 marks]

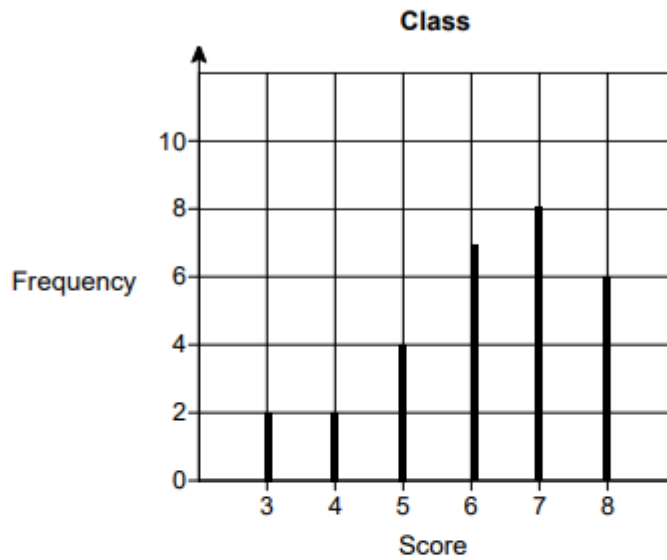**19 (b)** Use your graph to estimate the lowest mark of the top 20% of students.

[2 marks]

_____

_____

_____

Answer _____

11 Students in a class took a spelling test.

The diagram shows information about the scores.

Class

Lucy is one of the 29 students in the class.

Her score was the same as the **median** score for her class.

Work out her score.

[2 marks]

_____
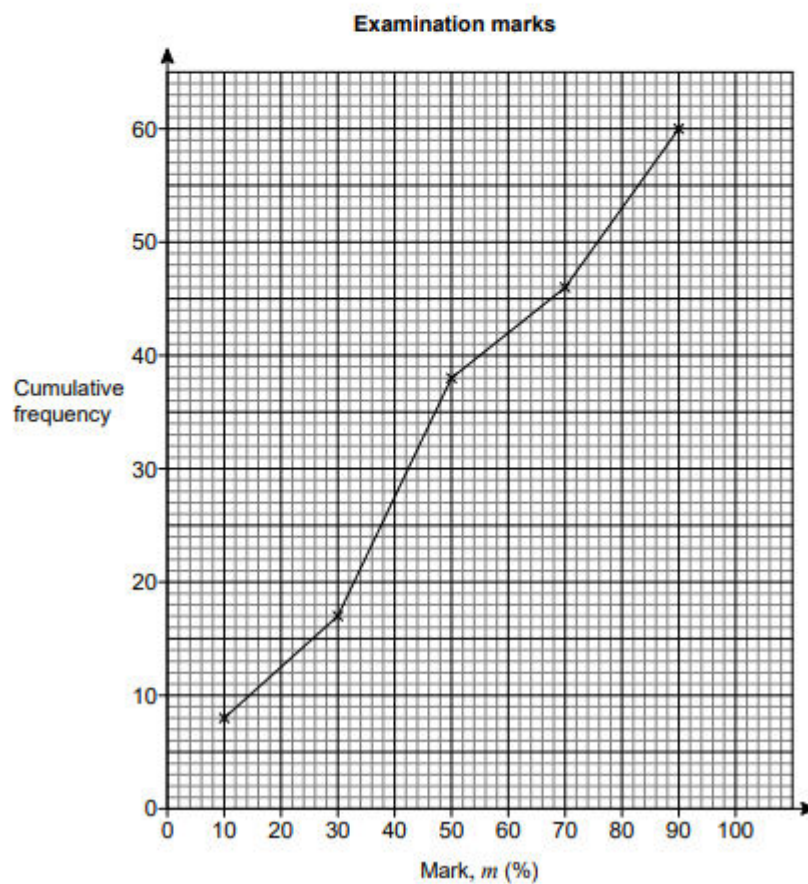
_____

Answer _____

AQA GSCE – Sample Paper 3 (Calculator) Higher Tier

25.

13   Here are the examination marks for 60 pupils.

Mark, m (%)	Frequency
$0 \leqslant m < 20$	8
$20 \leqslant m < 40$	9
$40 \leqslant m < 60$	21
$60 \leqslant m < 80$	10
$80 \leqslant m < 100$	12

Molly drew this cumulative frequency graph to show the data.

Examination marks

Make **two** criticisms of Molly's graph.

[2 marks]

Criticism 1 _____

_____

_____

Criticism 2 _____

_____

_____