

CUMULATIVE FREQUENCY

GRADE 7

Examination Practice Questions

You should have:

A ruler, protractor, compasses, a pen, pencil, eraser, calculator.
For some questions, you may need tracing paper.

Instructions

- Use **black** ink or ball-point pen.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The marks for each question are shown in brackets.
- Use the number of marks for each question as a guide as to how much time to spend on each question. As a rough guide, you can multiply the number of marks by 1.2 to see how many minutes you should spend on a question.
- Questions been carefully compiled from or modelled on a variety of past papers and will generally get more challenging as the document progresses. Some of the later questions will go beyond the core grade level for this topic.

Advice

- Read each question carefully before you start to answer it.
- Don't forget to have fun.
- Check your answers at the end.

The grouped frequency table gives information about the ages of 200 elephants.

Age (t years)	Frequency
$0 < t \leq 10$	55
$10 < t \leq 20$	60
$20 < t \leq 30$	40
$30 < t \leq 40$	22
$40 < t \leq 50$	13
$50 < t \leq 60$	10

Complete the cumulative frequency table.

Age (t years)	Cumulative frequency
$0 < t \leq 10$	55
$0 < t \leq 20$	115
$0 < t \leq 30$	155
$0 < t \leq 40$	177
$0 < t \leq 50$	190
$0 < t \leq 60$	200

(1)

The table gives information about the times taken, in minutes, for 80 taxi journeys.

Time taken (t minutes)	Frequency
$0 < t \leq 5$	7
$5 < t \leq 10$	10
$10 < t \leq 15$	12
$15 < t \leq 20$	19
$20 < t \leq 25$	18
$25 < t \leq 30$	14

Complete the cumulative frequency table.

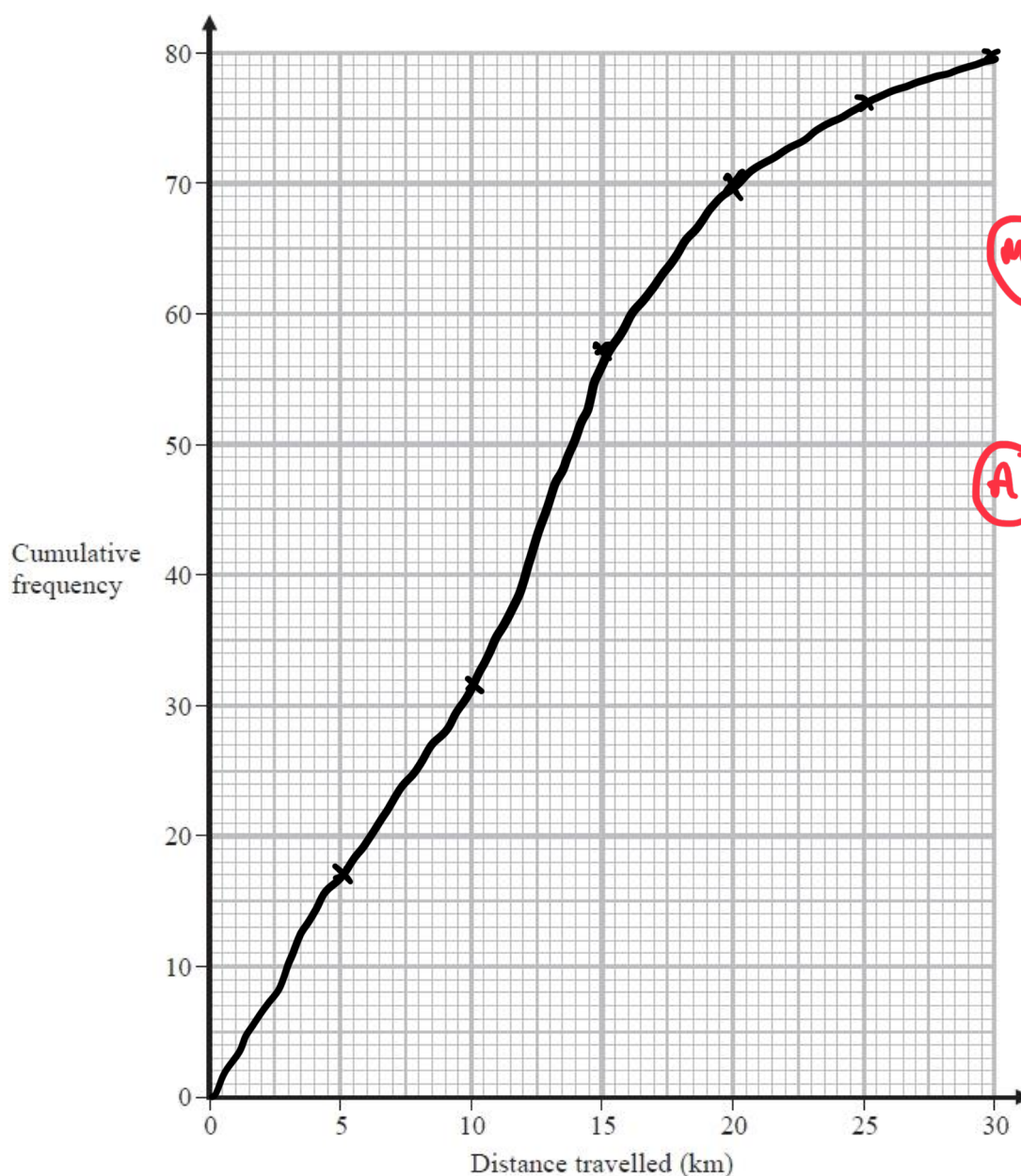
Time taken (t minutes)	Cumulative frequency
$0 < t \leq 5$	7
$0 < t \leq 10$	17
$0 < t \leq 15$	29
$0 < t \leq 20$	48
$0 < t \leq 25$	66
$0 < t \leq 30$	80

(1)

The cumulative frequency table gives information about the distance, in kilometres, that each of 80 workers travel from home to work at Office A.

Distance travelled (d km)	Cumulative frequency
$0 < d \leq 5$	17
$0 < d \leq 10$	32
$0 < d \leq 15$	57
$0 < d \leq 20$	70
$0 < d \leq 25$	76
$0 < d \leq 30$	80

On the grid below, draw a cumulative frequency graph for the information in the table.



(M1) Four
CORRECT
POINTS

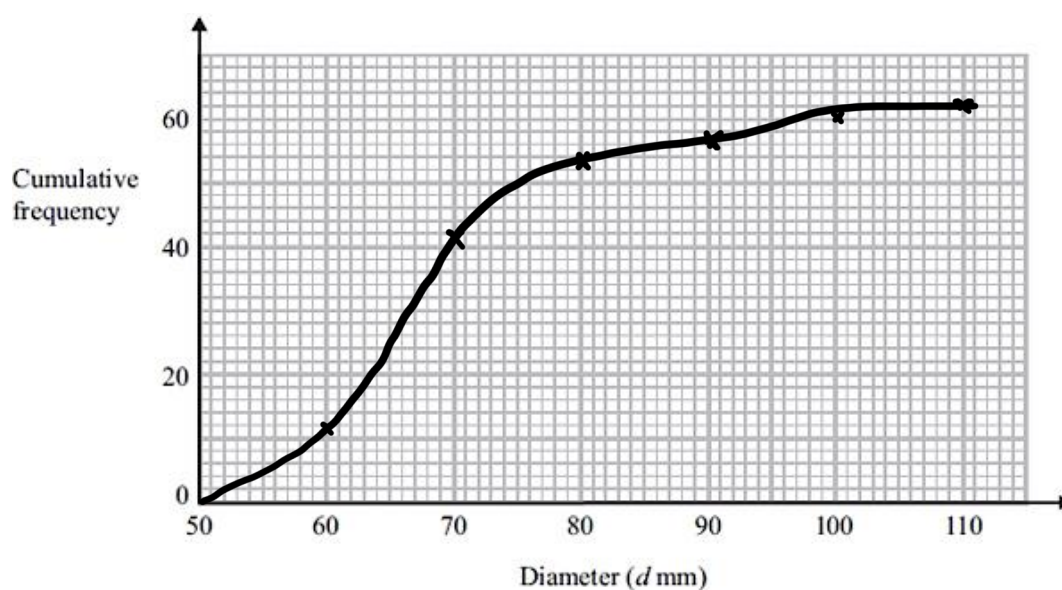
(A1) FULLY
CORRECT

The cumulative frequency table shows information about the diameters of 60 oranges.

Diameter (d mm)	Cumulative frequency
$50 < d \leq 60$	12
$50 < d \leq 70$	42
$50 < d \leq 80$	54
$50 < d \leq 90$	57
$50 < d \leq 100$	59
$50 < d \leq 110$	60

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

(2)



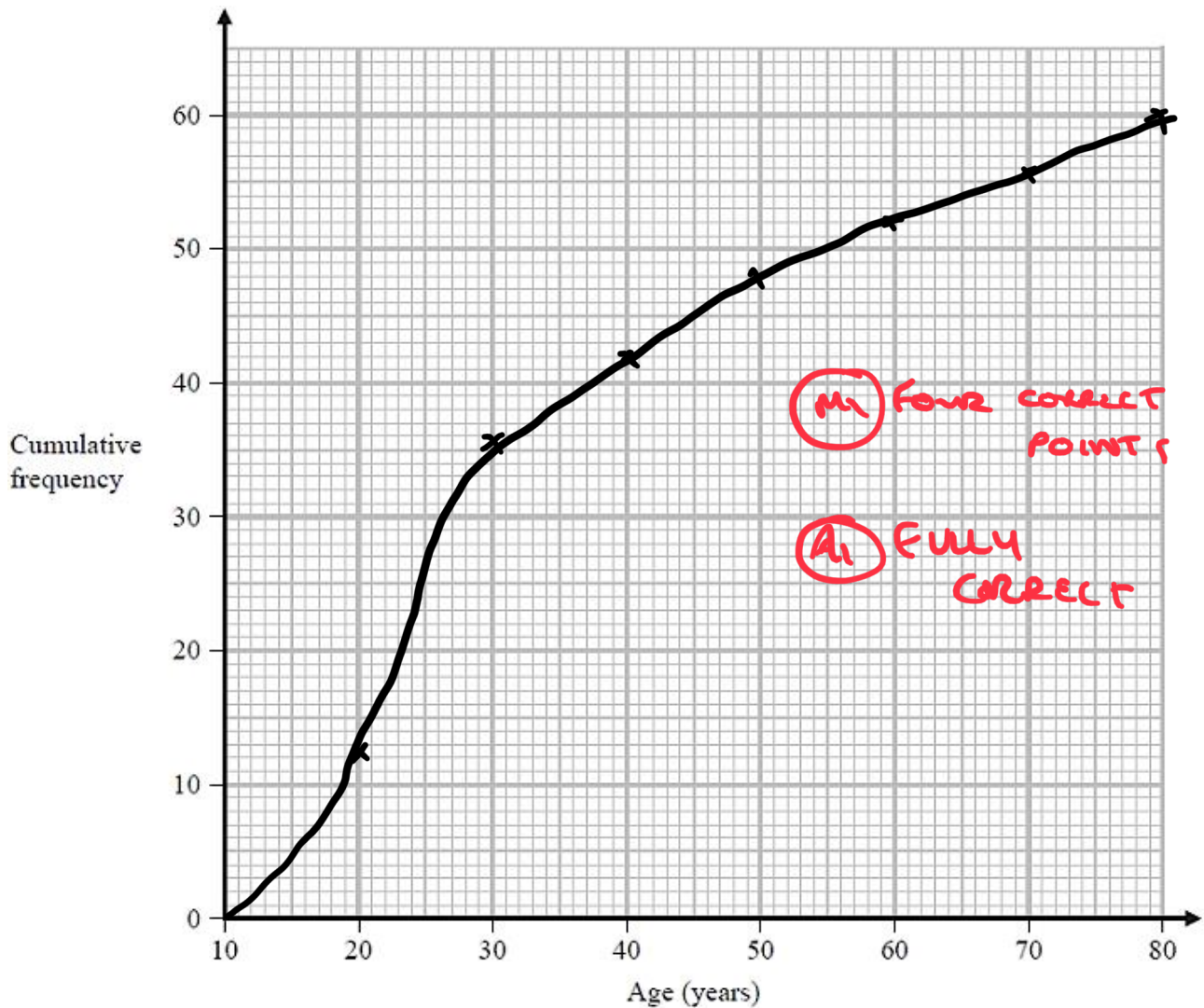
(B) FOUR CORRECT POINTS

(A) FULL 4 CORRECT

The cumulative frequency table shows information about the ages of 60 people who went to a gym on Saturday.

Age (a years)	Cumulative frequency
$10 < a \leq 20$	13
$10 < a \leq 30$	36
$10 < a \leq 40$	42
$10 < a \leq 50$	47
$10 < a \leq 60$	52
$10 < a \leq 70$	56
$10 < a \leq 80$	60

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



The table gives information about the times taken by 80 people to run a race.

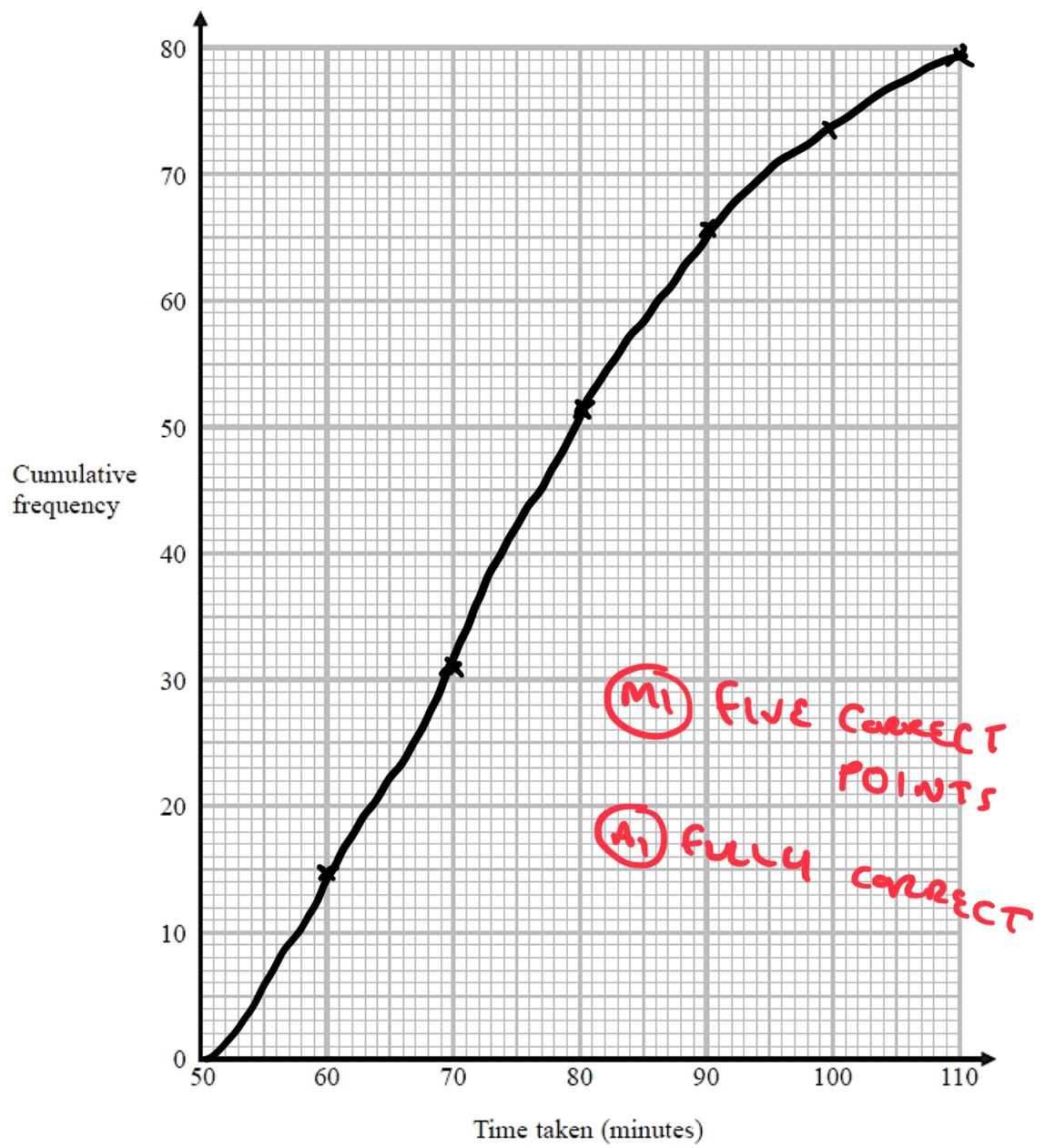
Time taken (t minutes)	Frequency
$50 < t \leq 60$	15
$60 < t \leq 70$	16
$70 < t \leq 80$	21
$80 < t \leq 90$	14
$90 < t \leq 100$	8
$100 < t \leq 110$	6

(a) Complete the cumulative frequency table.

Time taken (t minutes)	Cumulative frequency
$50 < t \leq 60$	15
$50 < t \leq 70$	31
$50 < t \leq 80$	52
$50 < t \leq 90$	66
$50 < t \leq 100$	74
$50 < t \leq 110$	80

(1)

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



The table shows information about the speeds of 60 cycles.

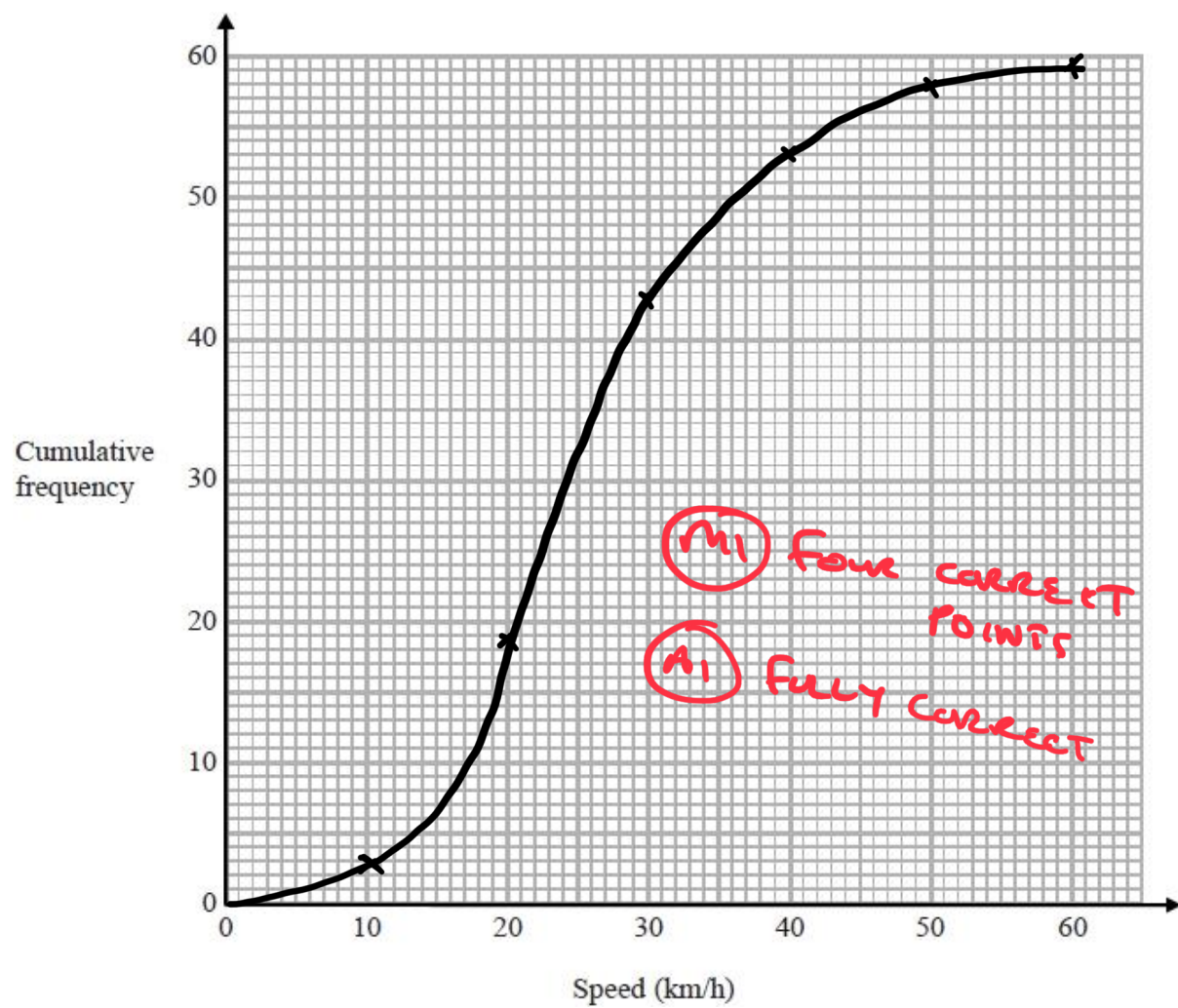
Speed (s km/h)	Frequency
$0 < s \leq 10$	3
$10 < s \leq 20$	16
$20 < s \leq 30$	24
$30 < s \leq 40$	10
$40 < s \leq 50$	5
$50 < s \leq 60$	2

(a) Complete the cumulative frequency table.

Speed (s km/h)	Cumulative frequency
$0 < s \leq 10$	3
$0 < s \leq 20$	19
$0 < s \leq 30$	43
$0 < s \leq 40$	53
$0 < s \leq 50$	58
$0 < s \leq 60$	60

(1)

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



The table gives information about the ages, in years, of 80 people in a train carriage.

Age (a years)	Frequency
$0 < a \leq 20$	7
$20 < a \leq 30$	25
$30 < a \leq 40$	20
$40 < a \leq 50$	14
$50 < a \leq 60$	8
$60 < a \leq 70$	6

(a) Complete the cumulative frequency table.

Age (a years)	Cumulative frequency
$0 < a \leq 20$	7
$0 < a \leq 30$	32
$0 < a \leq 40$	52
$0 < a \leq 50$	66
$0 < a \leq 60$	74
$0 < a \leq 70$	80

(1)

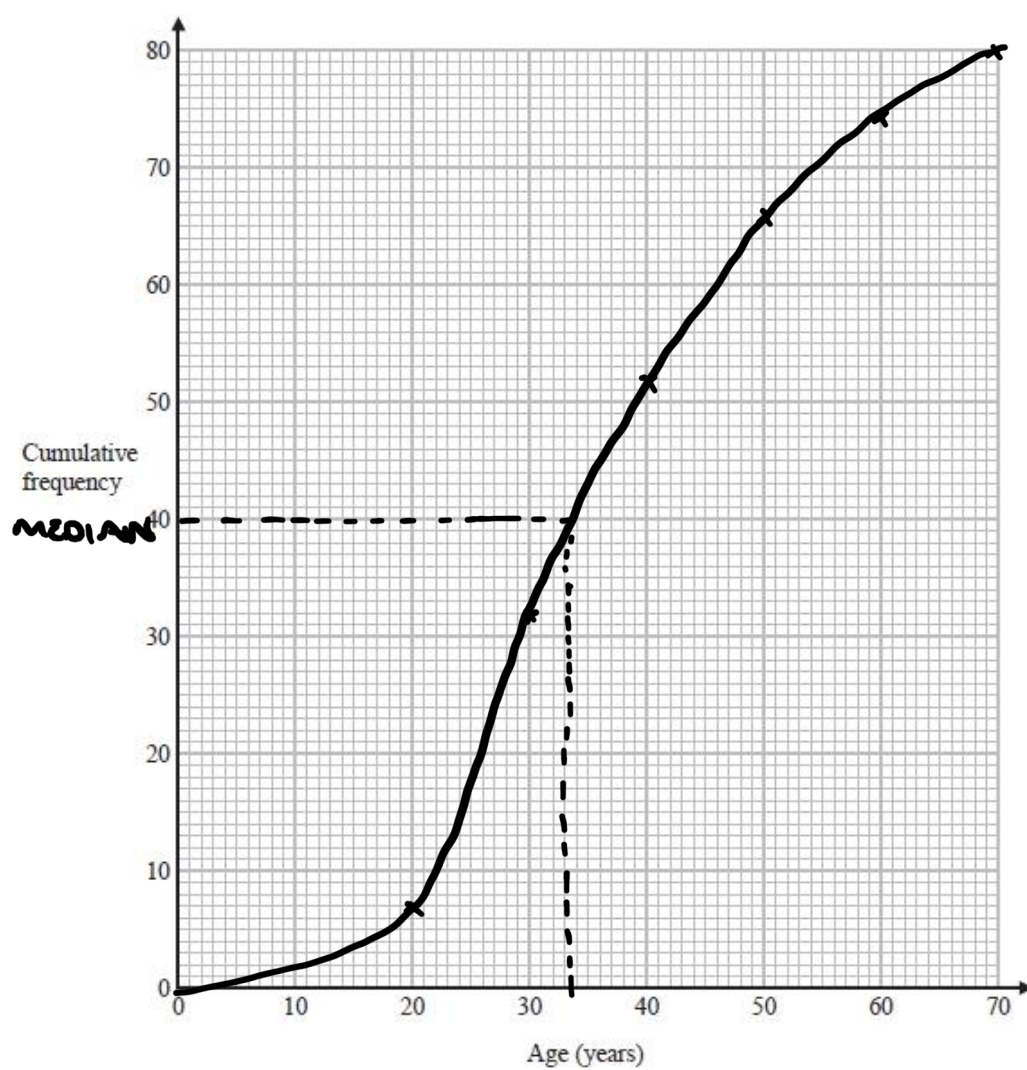
(b) On the grid opposite, draw a cumulative frequency graph for your table.

(2)

(c) Use your graph to find an estimate for the median age of the 80 people.

.....33..... years

(1)



The table shows information about the times, in minutes, that 80 patients had to wait to see a doctor.

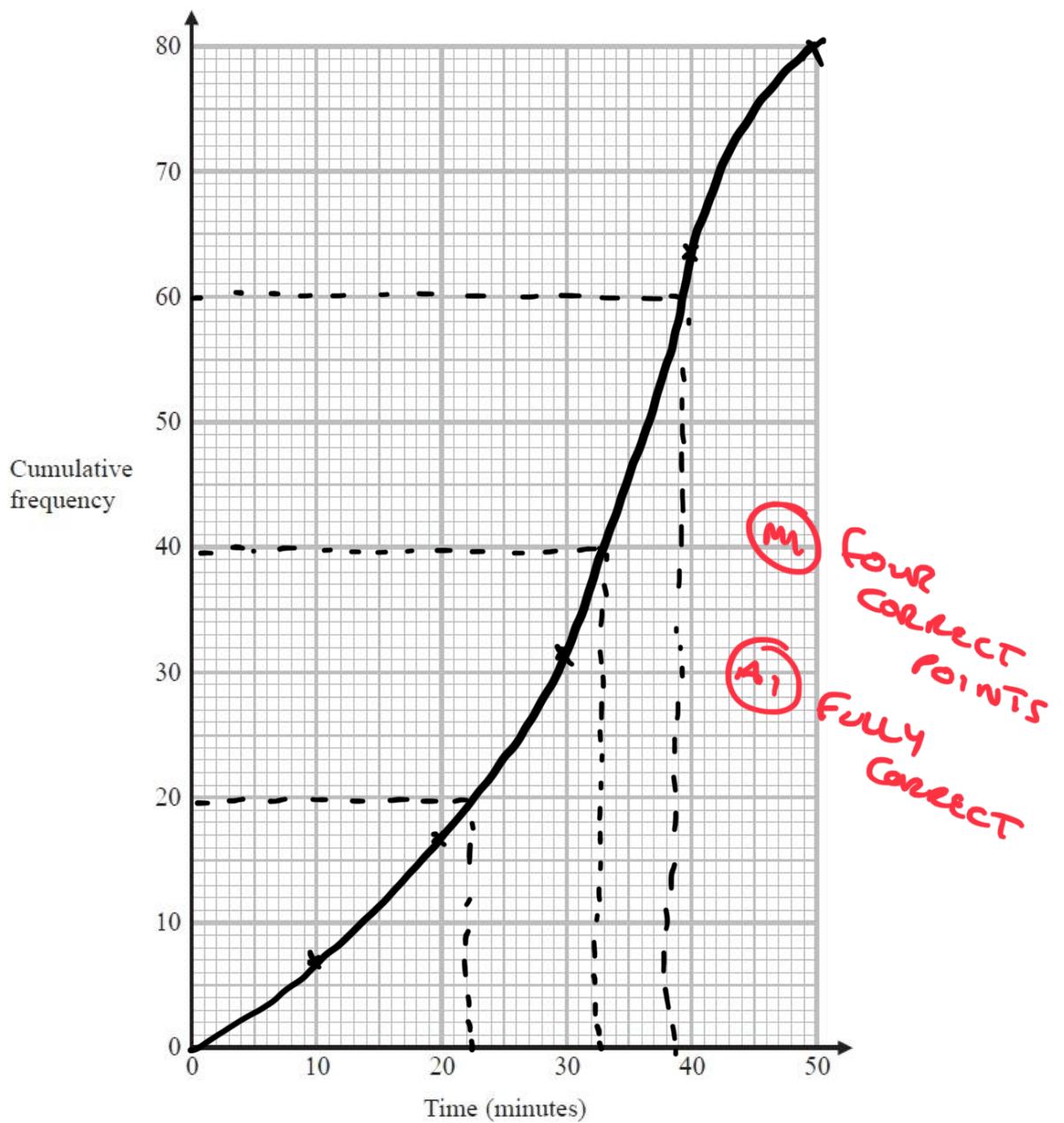
Time (W minutes)	Frequency
$0 < W \leq 10$	7
$10 < W \leq 20$	10
$20 < W \leq 30$	15
$30 < W \leq 40$	32
$40 < W \leq 50$	16

(a) Complete the cumulative frequency table below.

Time (W minutes)	Cumulative frequency
$0 < W \leq 10$	7
$0 < W \leq 20$	17
$0 < W \leq 30$	32
$0 < W \leq 40$	64
$0 < W \leq 50$	80

(1)

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



(2)

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

33 minutes

(1)

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

39 - 23 = 16 minutes

(2)

EITHER M1

The frequency table gives information about the lengths of time 100 people spent in a coffee shop.

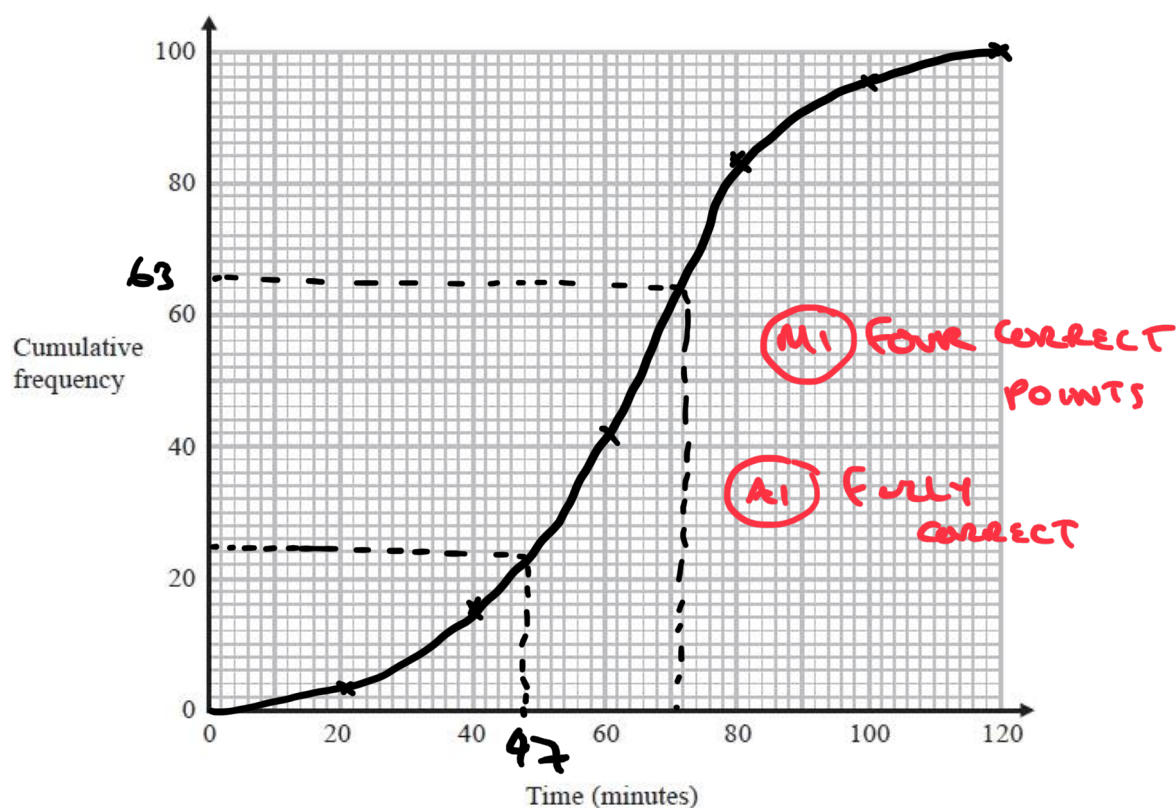
Time (t minutes)	Frequency
$0 < t \leq 20$	4
$20 < t \leq 40$	12
$40 < t \leq 60$	26
$60 < t \leq 80$	42
$80 < t \leq 100$	12
$100 < t \leq 120$	4

(a) Complete the cumulative frequency table.

Time (t minutes)	Cumulative frequency
$0 < t \leq 20$	4
$0 < t \leq 40$	16
$0 < t \leq 60$	42
$0 < t \leq 80$	84
$0 < t \leq 100$	96
$0 < t \leq 120$	100

(1)

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



(2)

(c) Use your graph to find an estimate for the lower quartile.

47 minutes
(1)

(d) Use your graph to find an estimate for the number of these people who spent longer than 70 minutes in the coffee shop.

100-63

mi

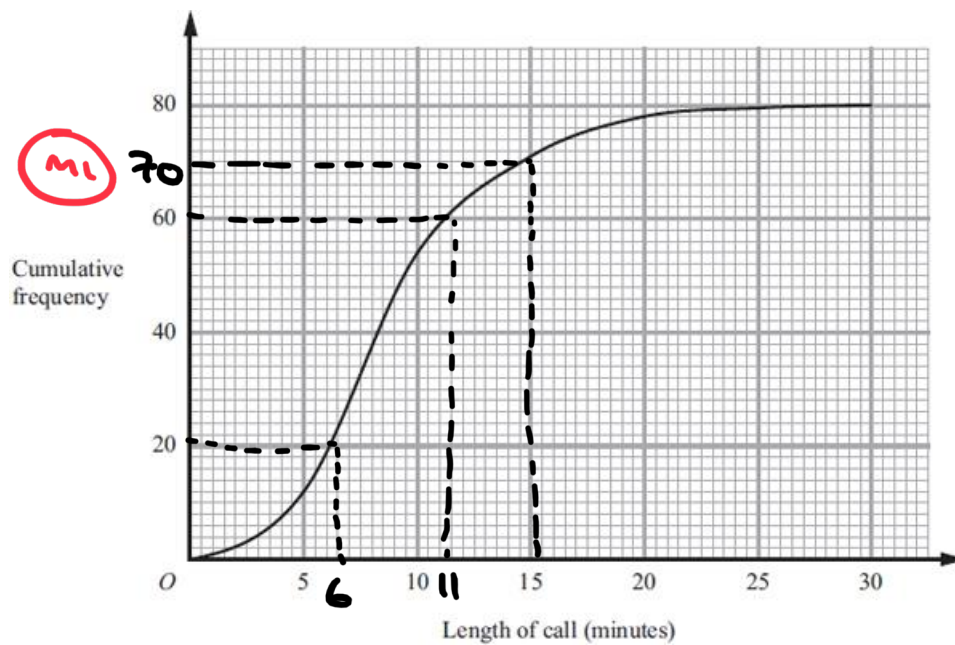
For A

READING
FROM THE

GRAPH

37
(2)

The cumulative frequency graph gives information about the lengths, in minutes, of 80 telephone calls.



- (a) Find an estimate for the number of calls which were longer than 15 minutes.

A_1 10

(2)

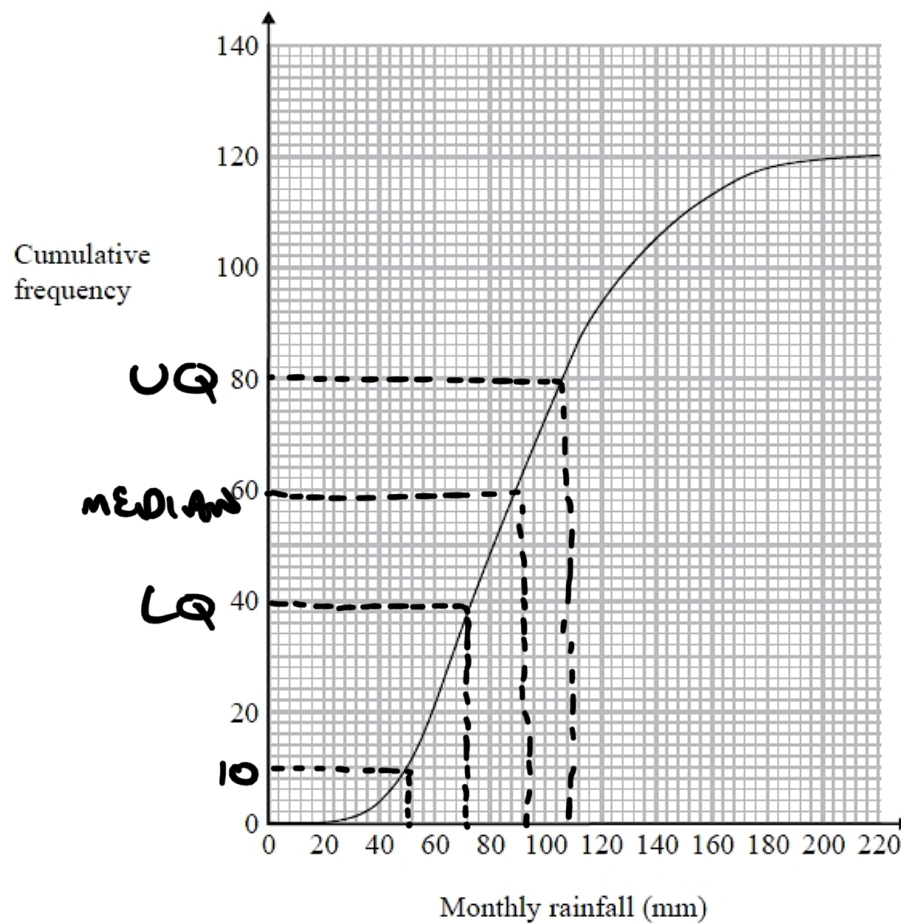
- (b) Find an estimate for the interquartile range of the lengths of the 80 calls.

$11 - 6$
 $\underline{\hspace{1cm}}$
 m_1

5 A_1 minutes

(2)

The cumulative frequency graph gives information about the monthly rainfall, in millimetres, in the United Kingdom during 120 months in the years 2001 to 2010.



- (a) Use the graph to estimate the number of months for which rainfall was less than 50 mm.

10

(1)

- (b) Use the graph to find an estimate for the median monthly rainfall.

90

mm

(1)

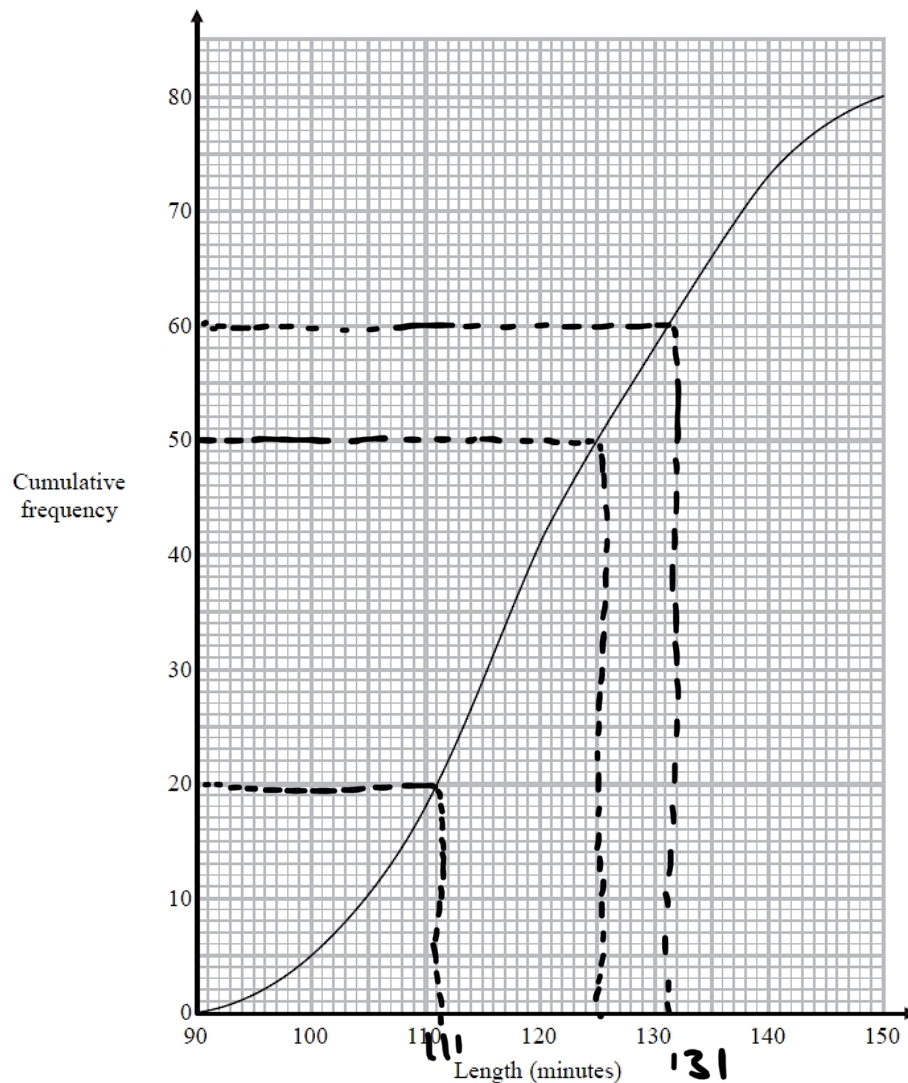
- (c) Use the graph to find an estimate for the interquartile range of the monthly rainfall.

118 - 68
50
m

50 118
mm

(2)

The cumulative frequency graph shows information about the length, in minutes, of each of 80 films.



(a) Find an estimate for the interquartile range.

$$\underbrace{131 - 111}_{\text{EITHER } m_1} \dots\dots\dots 20 \text{ } m_1 \dots\dots\dots \text{ minutes}$$

(2)

(b) Find an estimate for the percentage of the 80 films that lasted more than 125 minutes.

$$80 - 50 = 30 \text{ } m_1$$

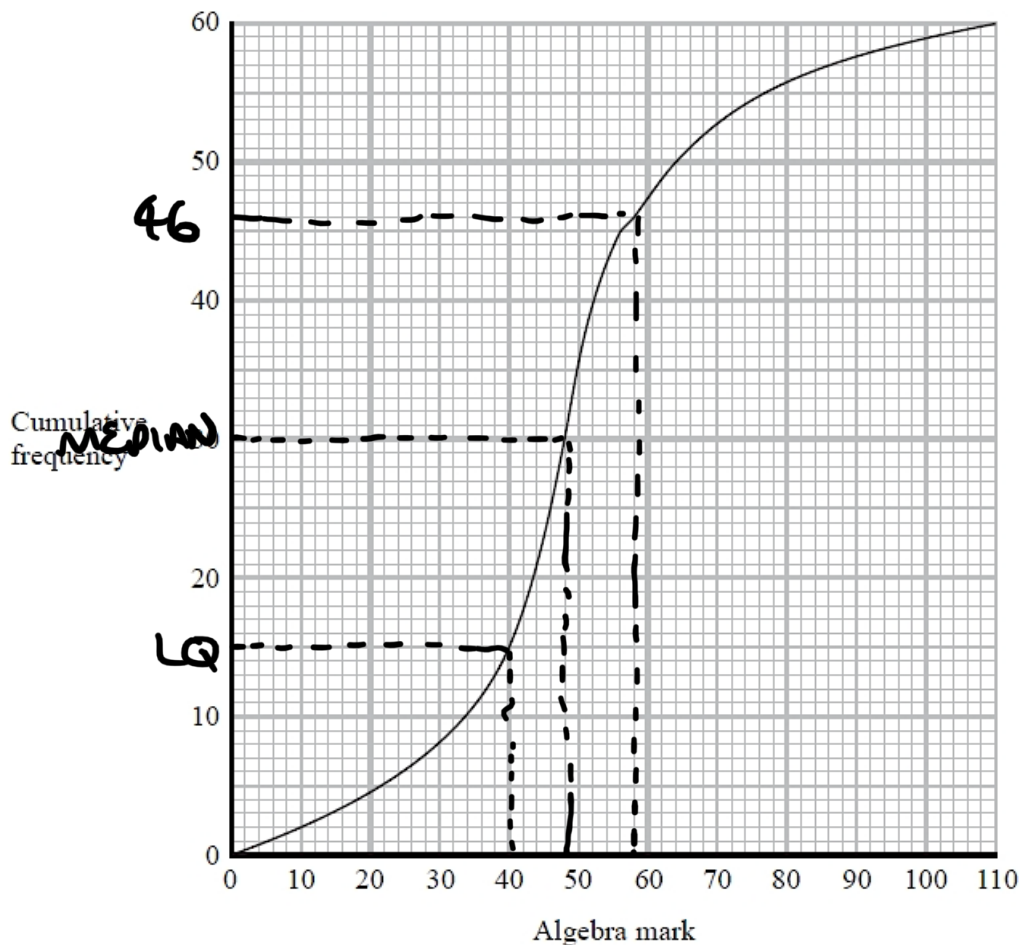
$$\frac{30}{80} \times 100 \text{ } m_1 \dots\dots\dots 37.5 \text{ } A_1 \dots\dots\dots \%$$

(3)

A group of 60 students each sat an algebra test and a geometry test.

Each test was marked out of 110.

The cumulative frequency graph gives information about the marks gained by the 60 students in the algebra test.



(a) Use the graph to find an estimate for the median mark in the algebra test.

48

(1)

(b) Use the graph to find an estimate for the number of students who gained 58 marks or less in the algebra test.

46

(1)

(c) Use the graph to find an estimate for the interquartile range of the marks gained in the algebra test.

$$\text{m.i. } \underline{56 - 40} =$$

UQ LQ

16

A1

(2)

The interquartile range of the marks gained in the geometry test is 9

Luis says

"The students' marks are more spread out in the algebra test than in the geometry test."

(d) Is Luis correct?

Give a reason for your answer.

yes. IQR For ALGEBRA TEST
WAS GREATER THAN GEOMETRY

(1)

To be awarded a grade A in the algebra test, a student had to gain a mark greater than 64.

Two students are to be selected at random from the 60 students in the group.

(e) Use the graph to find an estimate for the probability that both of these students were awarded a grade A in the algebra test.

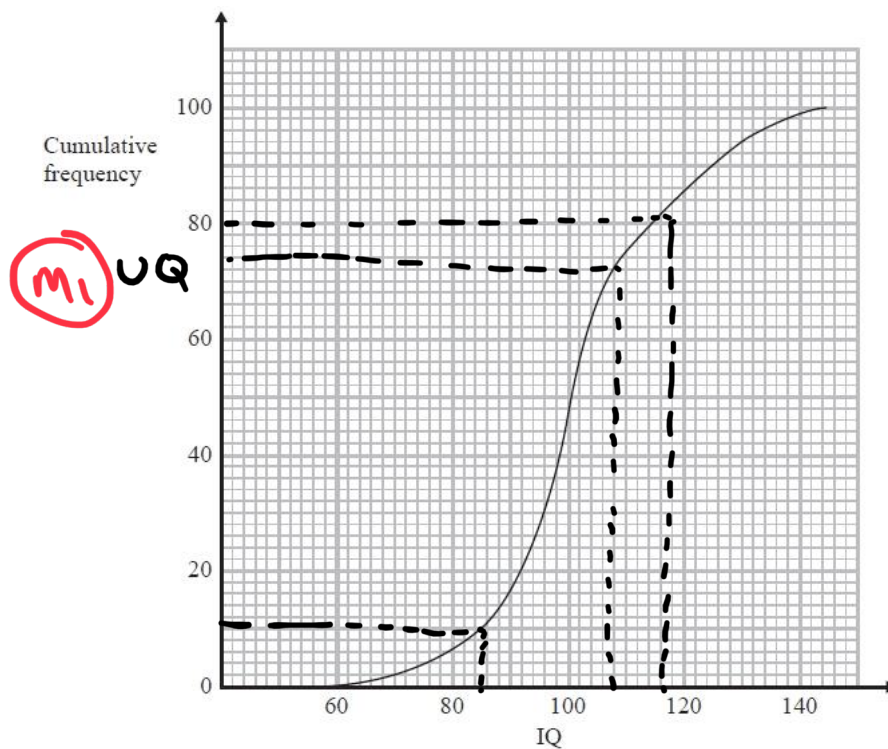
$$60 - 50 = 10 \quad m_1$$

$$\frac{10}{60} \times \frac{10-1}{59} = m_1$$

$$3/118 \quad m_1$$

(3)

The cumulative frequency graph gives information about the intelligence quotients (IQ) of a random sample of 100 adults.



- (a) Use the cumulative frequency graph to find an estimate for the number of adults in the sample who have an IQ between 85 and 115

$$\underbrace{70 - 10 =}_{m_1}$$

$$70 \quad \bar{A}_1$$

(2)

- (b) Find an estimate for the upper quartile of the IQ of adults in the sample.

$$\bar{A}_1 \quad 110$$

(2)