

Statistics*(Past Year Topical Questions 2010-2015)*May/June 2010 (41)

- 2** 40 students are asked about the number of people in their families.

The table shows the results.

Number of people in family	2	3	4	5	6	7
Frequency	1	1	17	12	6	3

(a) Find

(i) the mode,

Answer(a)(i) [1]

(ii) the median,

Answer(a)(ii) [1]

(iii) the mean.

Answer(a)(iii) [3]

- (b) Another n students are asked about the number of people in their families.

The mean for these n students is 3.

Find, in terms of n , an expression for the mean number for all $(40 + n)$ students.

Answer(b) [2]

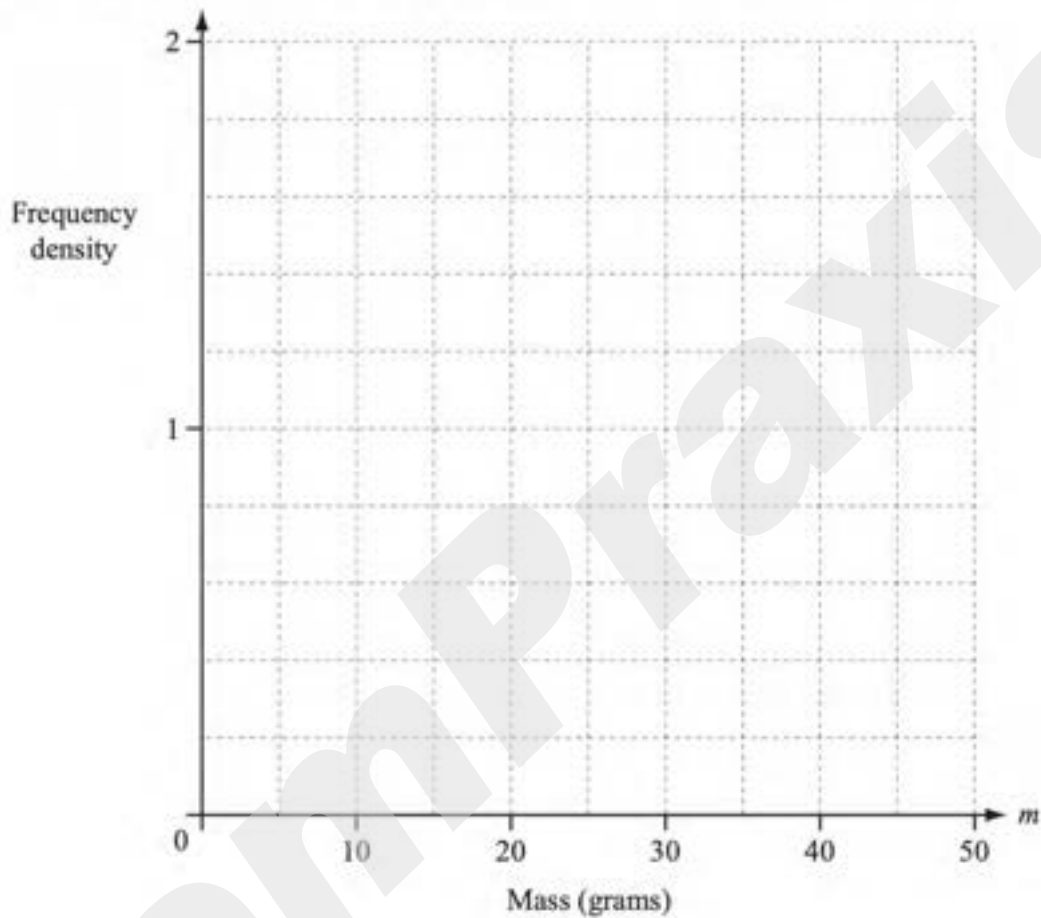
- 6 The masses of 60 potatoes are measured.
The table shows the results.

Mass (m grams)	$10 < m \leq 20$	$20 < m \leq 40$	$40 < m \leq 50$
Frequency	10	30	20

- (a) Calculate an estimate of the mean.

Answer(a) g [4]

(b) On the grid, draw an accurate histogram to show the information in the table.



[3]

May/June 2010 (42)

- 7 200 students were asked how many hours they exercise each week.

The table shows the results.

Time (t hours)	$0 < t \leq 5$	$5 < t \leq 10$	$10 < t \leq 15$	$15 < t \leq 20$	$20 < t \leq 25$	$25 < t \leq 30$	$30 < t \leq 35$	$35 < t \leq 40$
Number of students	12	15	23	30	40	35	25	20

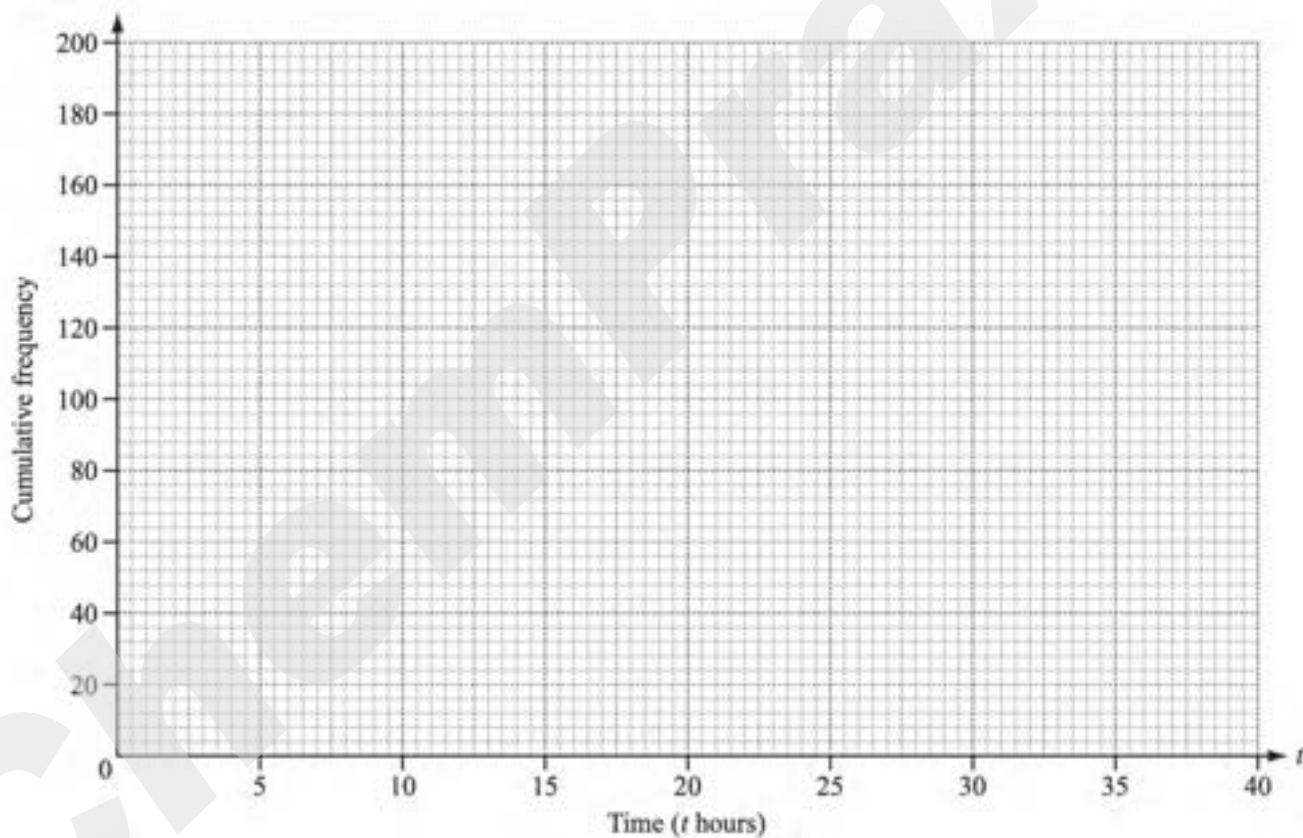
- (a) Calculate an estimate of the mean.

Answer(a) h [4]

(b) Use the information in the table above to complete the cumulative frequency table.

Time (t hours)	$t \leq 5$	$t \leq 10$	$t \leq 15$	$t \leq 20$	$t \leq 25$	$t \leq 30$	$t \leq 35$	$t \leq 40$
Cumulative frequency	12	27	50	80	120			200

[1]



(c) On the grid, draw a cumulative frequency diagram to show the information in the table in part (b). [4]

(d) On your cumulative frequency diagram show how to find the lower quartile. [1]

(e) Use your cumulative frequency diagram to find

(i) the median,

Answer(e)(i) [1]

(ii) the inter-quartile range,

Answer(e)(ii) [1]

(iii) the 64th percentile,

Answer(e)(iii) [1]

(iv) the number of students who exercise for more than 17 hours.

Answer(e)(iv) [2]

May/June 2010 (43)

- 7 (a) The table shows how many books were borrowed by the 126 members of a library group in a month.

Number of books	11	12	13	14	15	16
Number of members (frequency)	35	28	22	18	14	9

Find the mode, the median and the mean for the number of books borrowed.

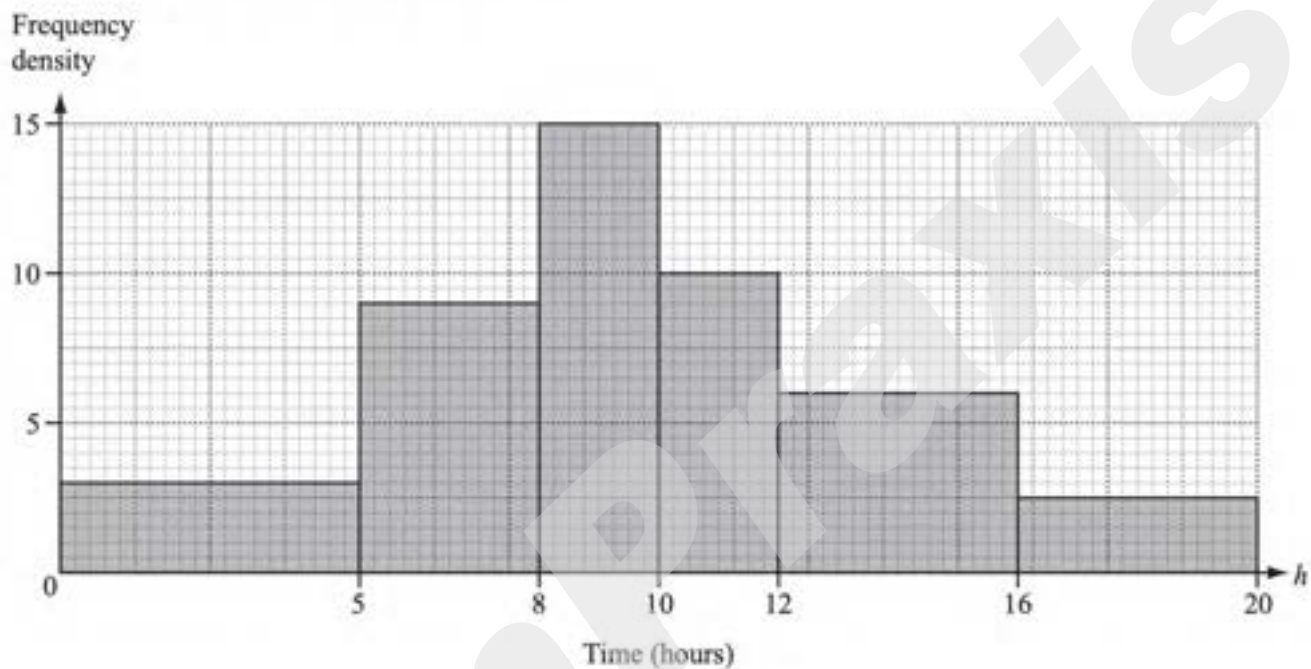
Answer(a) mode =

median =

mean = [6]

(b) The 126 members record the number of hours they read in one week.

The histogram shows the results.



(i) Use the information from the histogram to complete the frequency table.

Number of hours (h)	$0 < h \leq 5$	$5 < h \leq 8$	$8 < h \leq 10$	$10 < h \leq 12$	$12 < h \leq 16$	$16 < h \leq 20$
Frequency				20	24	10

[3]

- (ii) Use the information in this table to calculate an estimate of the mean number of hours.
Show your working.

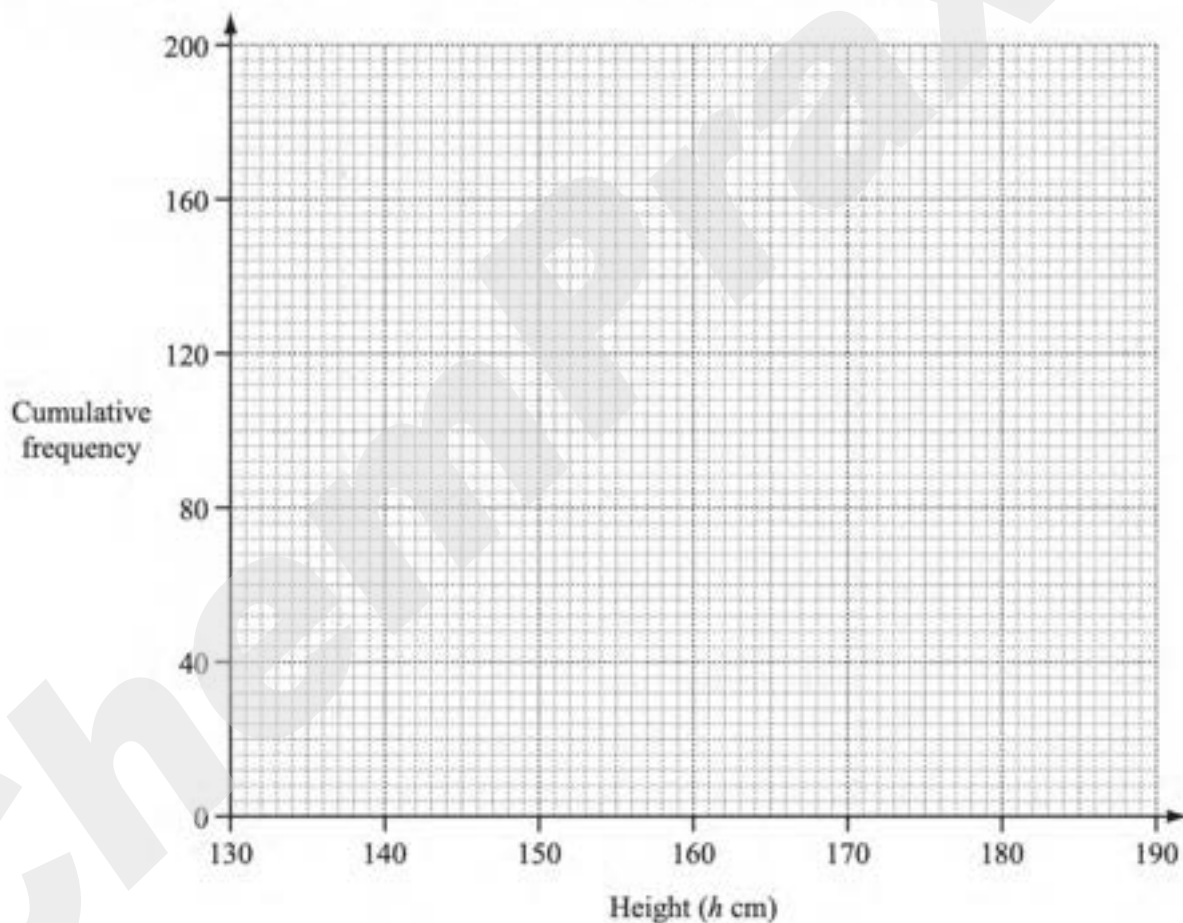
Answer(b)(ii) hours [4]

October/November 2010 (41)

- 5 The cumulative frequency table shows the distribution of heights, h centimetres, of 200 students.

Height (h cm)	≤ 130	≤ 140	≤ 150	≤ 160	≤ 165	≤ 170	≤ 180	≤ 190
Cumulative frequency	0	10	50	95	115	145	180	200

- (a) Draw a cumulative frequency diagram to show the information in the table.



[4]

(b) Use your diagram to find

(i) the median,

Answer(b)(i) cm [1]

(ii) the upper quartile,

Answer(b)(ii) cm [1]

(iii) the interquartile range.

Answer(b)(iii) cm [1]

(c) (i) One of the 200 students is chosen at random.

Use the table to find the probability that the height of this student is greater than 170 cm.
Give your answer as a fraction.

Answer(c)(i) [1]

(ii) One of the 200 students is chosen at random and then a second student is chosen at random from the remaining students.

Calculate the probability that one has a height greater than 170 cm and the other has a height of 140 cm or less.
Give your answer as a fraction.

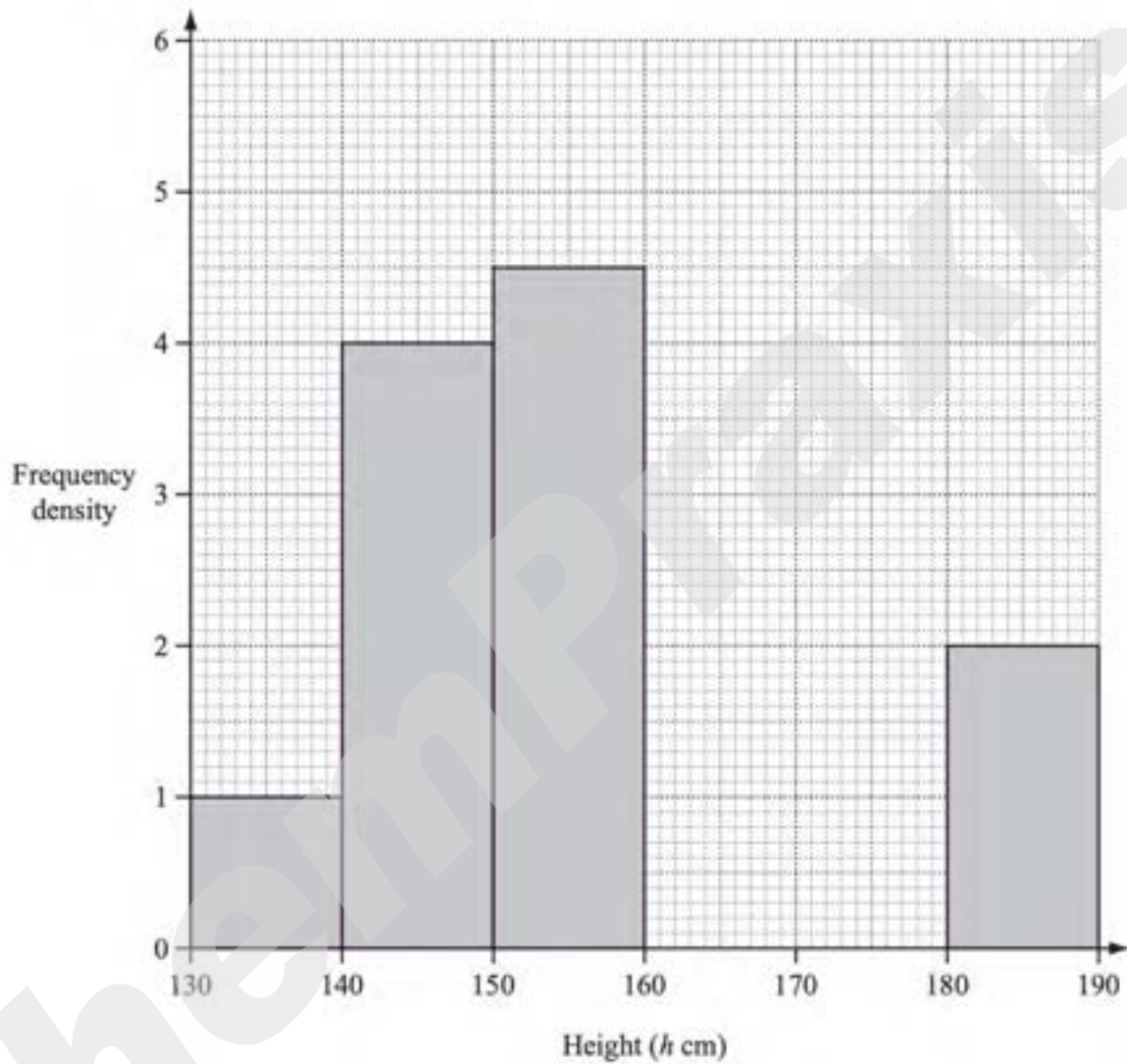
Answer(c)(ii) [3]

(d) (i) Complete this frequency table which shows the distribution of the heights of the 200 students.

Height (h cm)	$130 < h \leq 140$	$140 < h \leq 150$	$150 < h \leq 160$	$160 < h \leq 165$	$165 < h \leq 170$	$170 < h \leq 180$	$180 < h \leq 190$
Frequency	10	40	45	20			

[2]

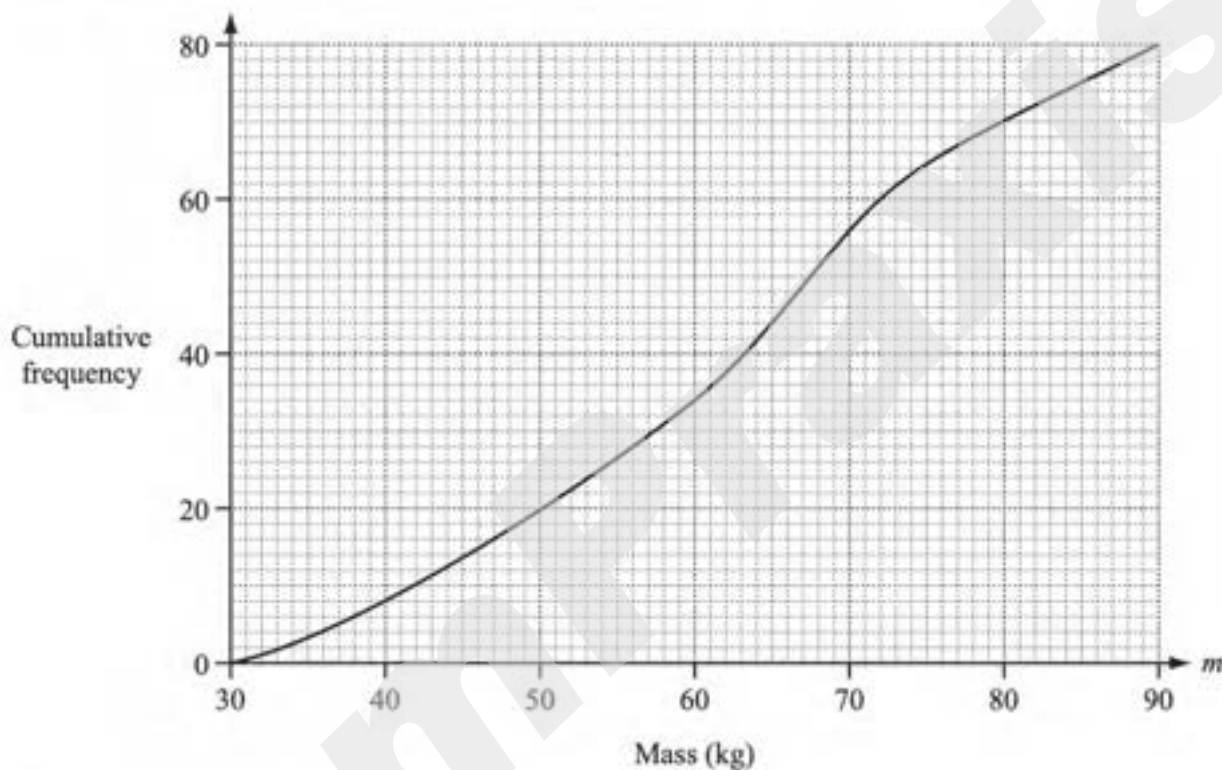
(ii) Complete this histogram to show the distribution of the heights of the 200 students.



[3]

October/November 2010 (42)

- 3 80 boys each had their mass, m kilograms, recorded.
The cumulative frequency diagram shows the results.



(a) Find

(i) the median,

Answer(a)(i) kg [1]

(ii) the lower quartile,

Answer(a)(ii) kg [1]

(iii) the interquartile range.

Answer(a)(iii) kg [1]

(b) How many boys had a mass greater than 60kg?

Answer(b) [2]

(c) (i) Use the cumulative frequency graph to complete this frequency table.

Mass, m	Frequency
$30 < m \leq 40$	8
$40 < m \leq 50$	
$50 < m \leq 60$	14
$60 < m \leq 70$	22
$70 < m \leq 80$	
$80 < m \leq 90$	10

[2]

(ii) Calculate an estimate of the mean mass.

Answer(c)(ii) kg [4]

May/June 2011 (41)

- 8 The table below shows the marks scored by a group of students in a test.

Mark	11	12	13	14	15	16	17	18
Frequency	10	8	16	11	7	8	6	9

- (a) Find the mean, median and mode.

Answer(a) mean =

median =

mode = [6]

(b) The table below shows the time (t minutes) taken by the students to complete the test.

Time (t)	$0 < t \leq 10$	$10 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 40$	$40 < t \leq 50$	$50 < t \leq 60$
Frequency	2	19	16	14	15	9

(i) Cara rearranges this information into a new table.

Complete her table.

Time (t)	$0 < t \leq 20$	$20 < t \leq 40$	$40 < t \leq 50$	$50 < t \leq 60$
Frequency				9

[2]

(ii) Cara wants to draw a histogram to show the information in **part (b)(i)**.

Complete the table below to show the interval widths and the frequency densities.

	$0 < t \leq 20$	$20 < t \leq 40$	$40 < t \leq 50$	$50 < t \leq 60$
Interval width				10
Frequency density				0.9

[3]

(c) **Some** of the students were asked how much time they spent revising for the test.

10 students revised for 2.5 hours, 12 students revised for 3 hours and n students revised for 4 hours.

The mean time that **these** students spent revising was 3.1 hours.

Find n .

Show all your working.

Answer(c) n = [4]

May/June 2011 (42)

6

Time (t mins)	$0 < t \leq 20$	$20 < t \leq 35$	$35 < t \leq 45$	$45 < t \leq 55$	$55 < t \leq 70$	$70 < t \leq 80$
Frequency	6	15	19	37	53	20

The table shows the times taken, in minutes, by 150 students to complete their homework on one day.

(a) (i) In which interval is the median time?

Answer(a)(i) [1]

- (ii) Using the mid-interval values 10, 27.5,calculate an estimate of the mean time.

Answer(a)(ii) min [3]

- (b) (i) Complete the table of cumulative frequencies.

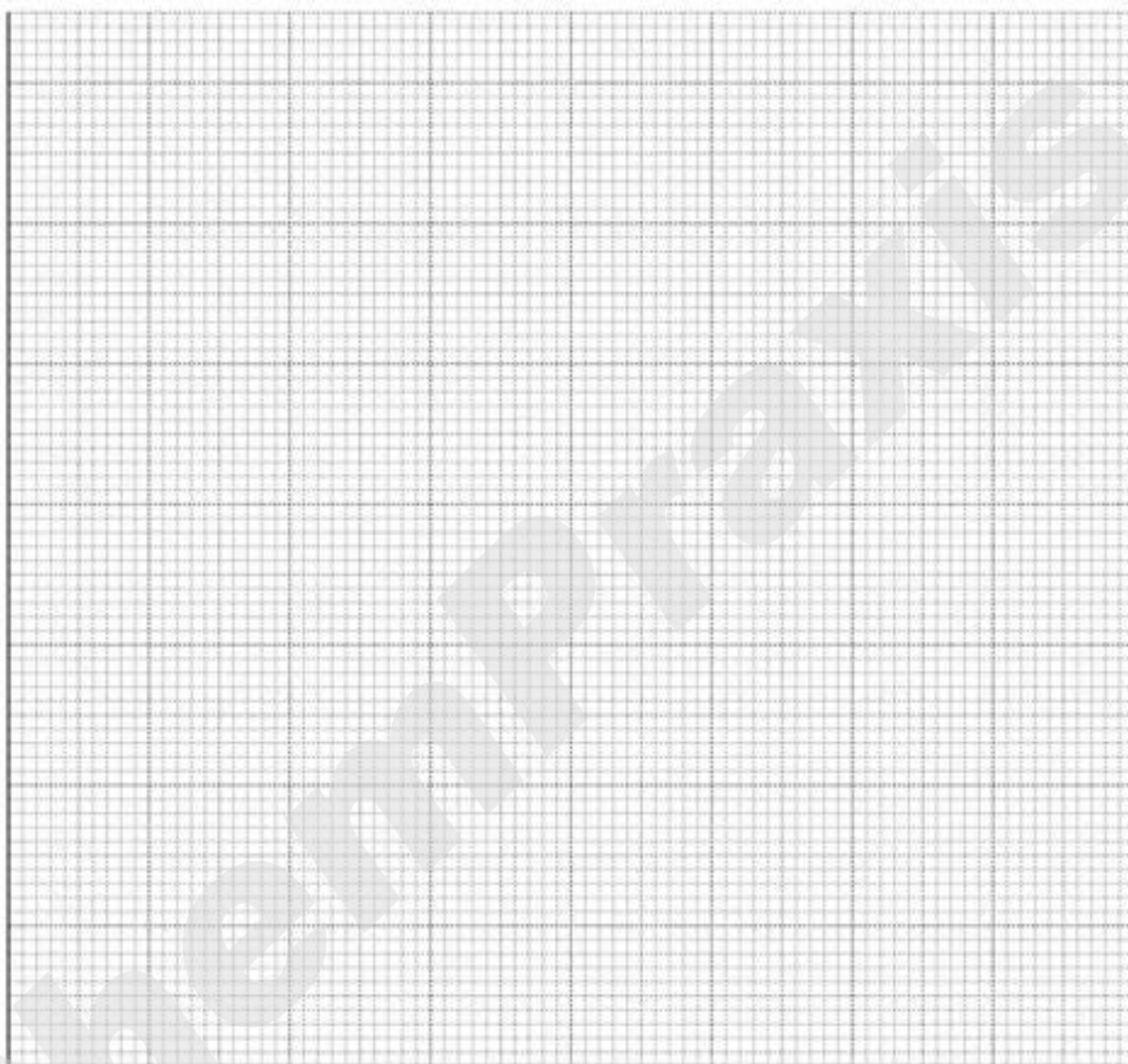
Time (t mins)	$t \leq 20$	$t \leq 35$	$t \leq 45$	$t \leq 55$	$t \leq 70$	$t \leq 80$
Cumulative frequency	6	21				

[2]

- (ii) On the grid, label the horizontal axis from 0 to 80, using the scale 1 cm represents 5 minutes and the vertical axis from 0 to 150, using the scale 1 cm represents 10 students.

Draw a cumulative frequency diagram to show this information.

[5]



(c) Use your graph to estimate

(i) the median time, *Answer(c)(i)* min [1]

(ii) the inter-quartile range, *Answer(c)(ii)* min [2]

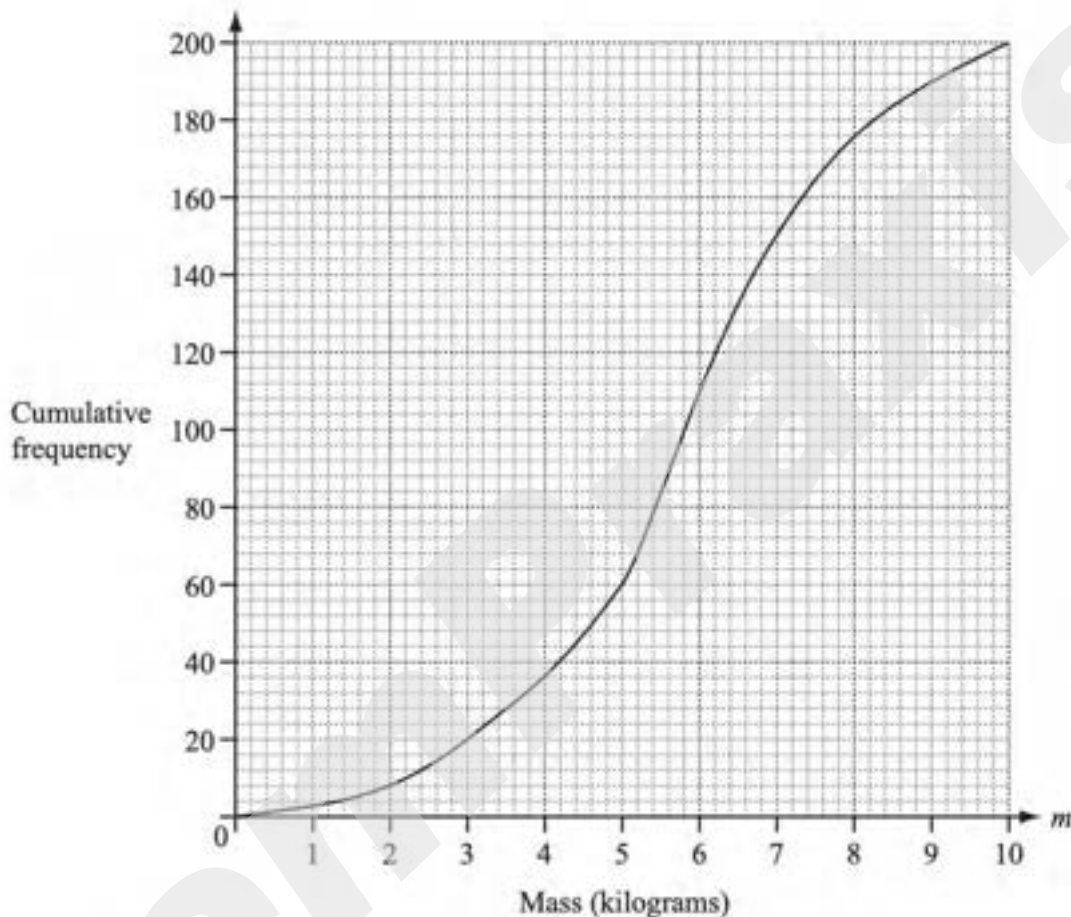
(iii) the number of students whose time was in the range $50 < t \leq 60$,
Answer(c)(iii) [1]

(iv) the probability, as a fraction, that a student, chosen at random, took longer than 50 minutes,
Answer(c)(iv) [2]

(v) the probability, as a fraction, that two students, chosen at random, both took longer than 50 minutes.
Answer(c)(v) [2]

May/June 2011 (43)

6



The masses of 200 parcels are recorded.

The results are shown in the cumulative frequency diagram above.

(a) Find

(i) the median,

Answer(a)(i) kg [1]

(ii) the lower quartile,

Answer(a)(ii) kg [1]

(iii) the inter-quartile range,

Answer(a)(iii) kg [1]

(iv) the number of parcels with a mass greater than 3.5 kg.

Answer(a)(iv) [2]

(b) (i) Use the information from the cumulative frequency diagram to complete the grouped frequency table.

Mass (m) kg	$0 < m \leq 4$	$4 < m \leq 6$	$6 < m \leq 7$	$7 < m \leq 10$
Frequency	36			50

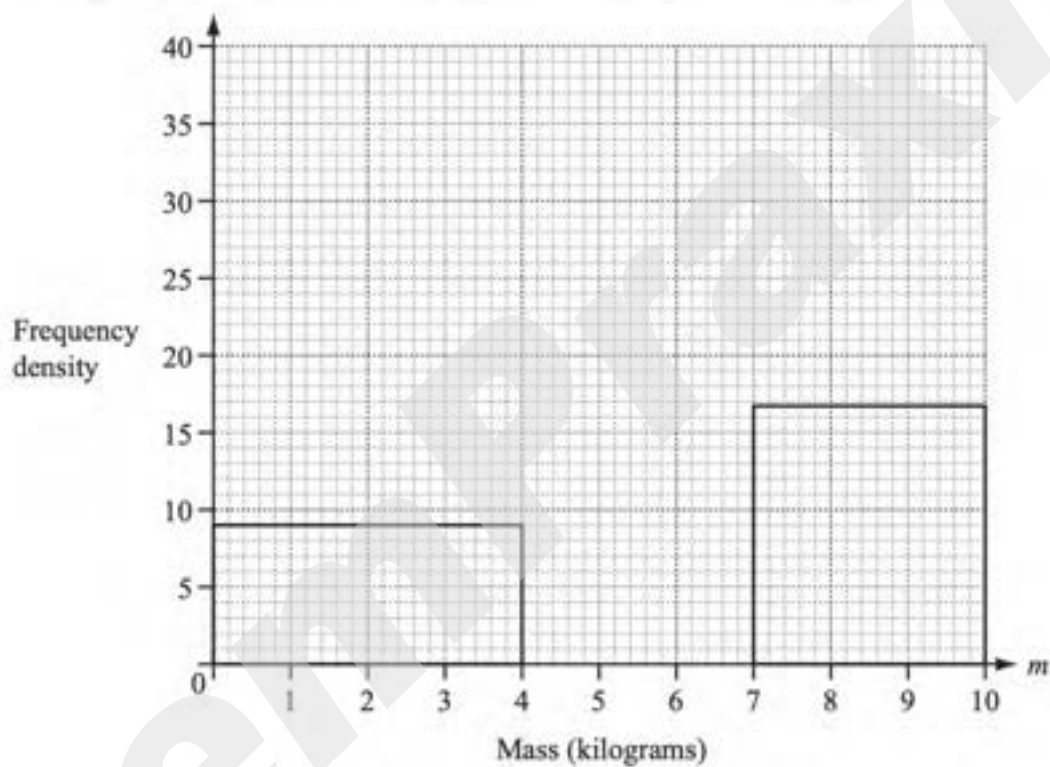
[2]

(ii) Use the grouped frequency table to calculate an estimate of the mean.

Answer(b)(ii) kg [4]

(iii) Complete the frequency density table and use it to complete the histogram.

Mass (m) kg	$0 < m \leq 4$	$4 < m \leq 6$	$6 < m \leq 7$	$7 < m \leq 10$
Frequency density	9			16.7



[4]

October/November 2011 (41)

- 3 The table shows information about the heights of 120 girls in a swimming club.

Height (h metres)	Frequency
$1.3 < h \leq 1.4$	4
$1.4 < h \leq 1.5$	13
$1.5 < h \leq 1.6$	33
$1.6 < h \leq 1.7$	45
$1.7 < h \leq 1.8$	19
$1.8 < h \leq 1.9$	6

- (a) (i) Write down the modal class.

Answer(a)(i) m [1]

- (ii) Calculate an estimate of the mean height. Show all of your working.

Answer(a)(ii) m [4]

- (b) Girls from this swimming club are chosen at random to swim in a race.
Calculate the probability that

- (i) the height of the first girl chosen is more than 1.8 metres,

Answer(b)(i) [1]

(ii) the heights of **both** the first and second girl chosen are 1.8 metres or less.

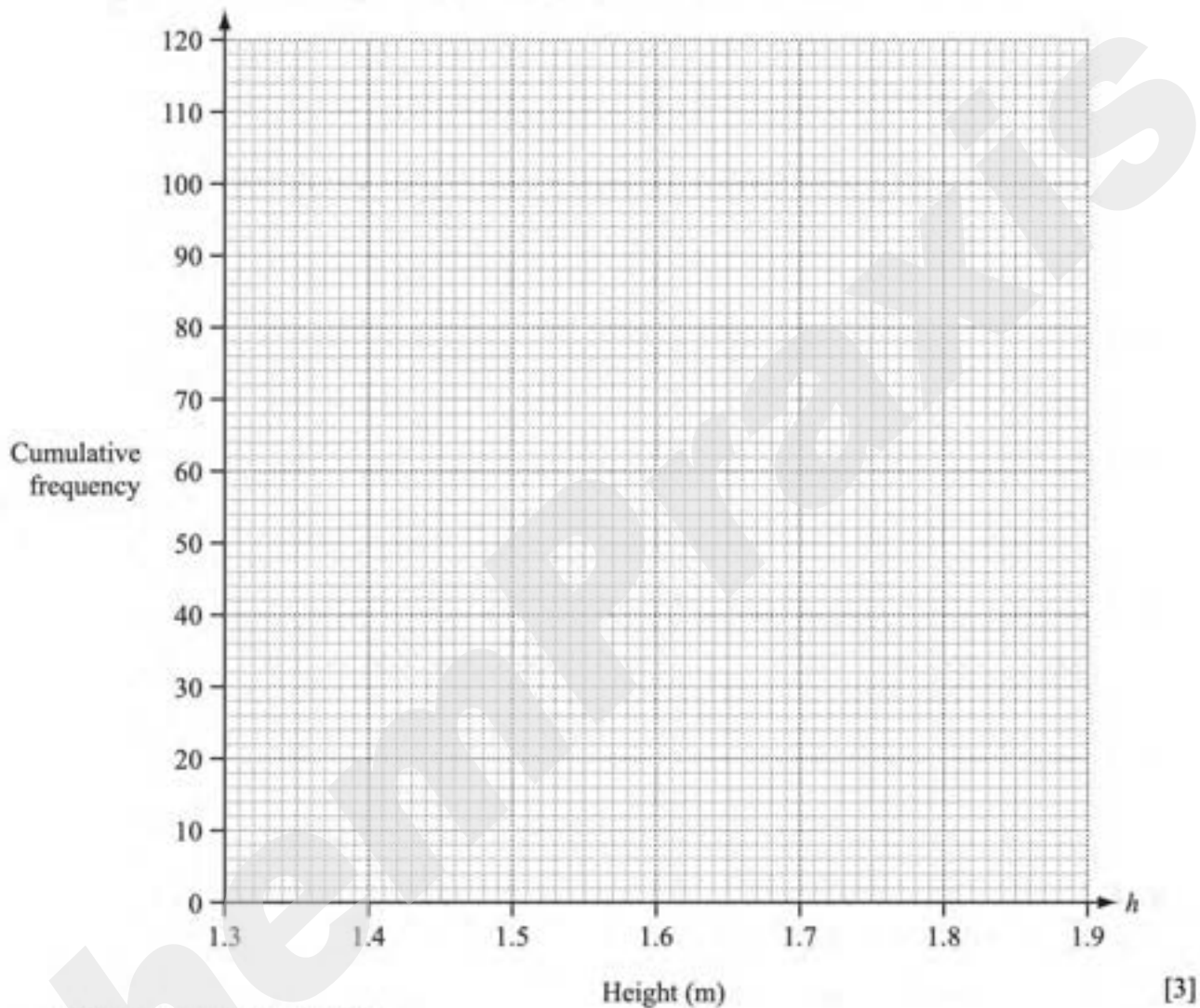
Answer(b)(ii) [3]

(c) (i) Complete the cumulative frequency table for the heights.

Height (h metres)	Cumulative frequency
$h \leq 1.3$	0
$h \leq 1.4$	4
$h \leq 1.5$	17
$h \leq 1.6$	50
$h \leq 1.7$	
$h \leq 1.8$	114
$h \leq 1.9$	

[1]

(ii) Draw the cumulative frequency graph on the grid.



(d) Use your graph to find

(i) the median height,

Answer(d)(i) m [1]

(ii) the 30th percentile.

Answer(d)(ii) m [1]

October/November 2011 (42)

- 5 (a) The times, t seconds, for 200 people to solve a problem are shown in the table.

Time (t seconds)	Frequency
$0 < t \leq 20$	6
$20 < t \leq 40$	12
$40 < t \leq 50$	20
$50 < t \leq 60$	37
$60 < t \leq 70$	42
$70 < t \leq 80$	50
$80 < t \leq 90$	28
$90 < t \leq 100$	5

Calculate an estimate of the mean time.

Answer(a) s [4]

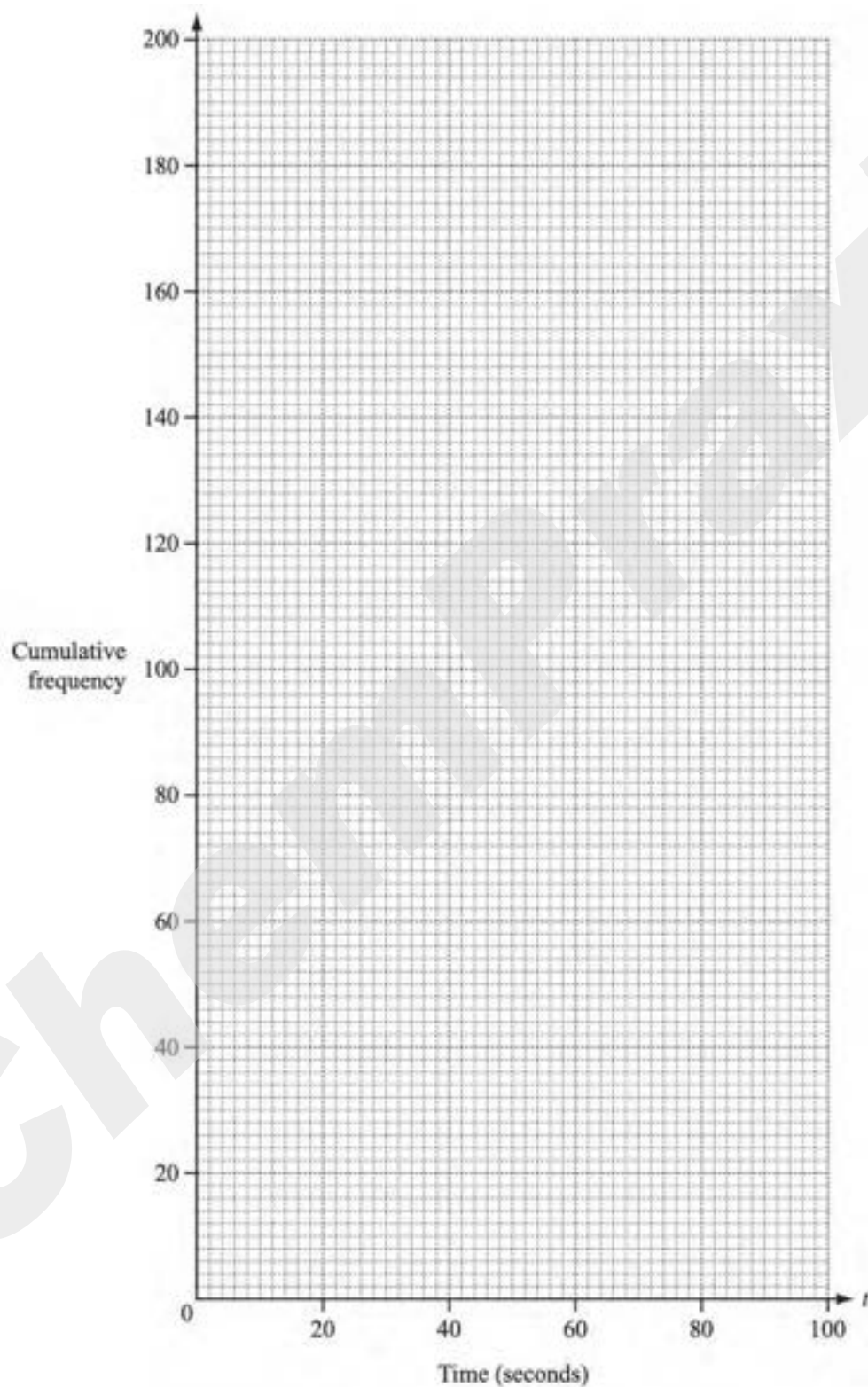
- (b) (i) Complete the cumulative frequency table for this data.

Time (t seconds)	$t \leq 20$	$t \leq 40$	$t \leq 50$	$t \leq 60$	$t \leq 70$	$t \leq 80$	$t \leq 90$	$t \leq 100$
Cumulative Frequency	6	18	38			167		

[2]

- (ii) Draw the cumulative frequency graph on the grid opposite to show this data.

[4]



(c) Use your cumulative frequency graph to find

(i) the median time,

Answer(c)(i) s [1]

(ii) the lower quartile,

Answer(c)(ii) s [1]

(iii) the inter-quartile range,

Answer(c)(iii) s [1]

(iv) how many people took between 65 and 75 seconds to solve the problem,

Answer(c)(iv) [1]

(v) how many people took longer than 45 seconds to solve the problem.

Answer(c)(v) [2]

October/November 2011 (43)

7 The times, t minutes, taken for 200 students to cycle one kilometre are shown in the table.

Time (t minutes)	$0 < t \leq 2$	$2 < t \leq 3$	$3 < t \leq 4$	$4 < t \leq 8$
Frequency	24	68	72	36

(a) Write down the class interval that contains the median.

Answer(a) [1]

- (b) Calculate an estimate of the mean.
Show all your working.

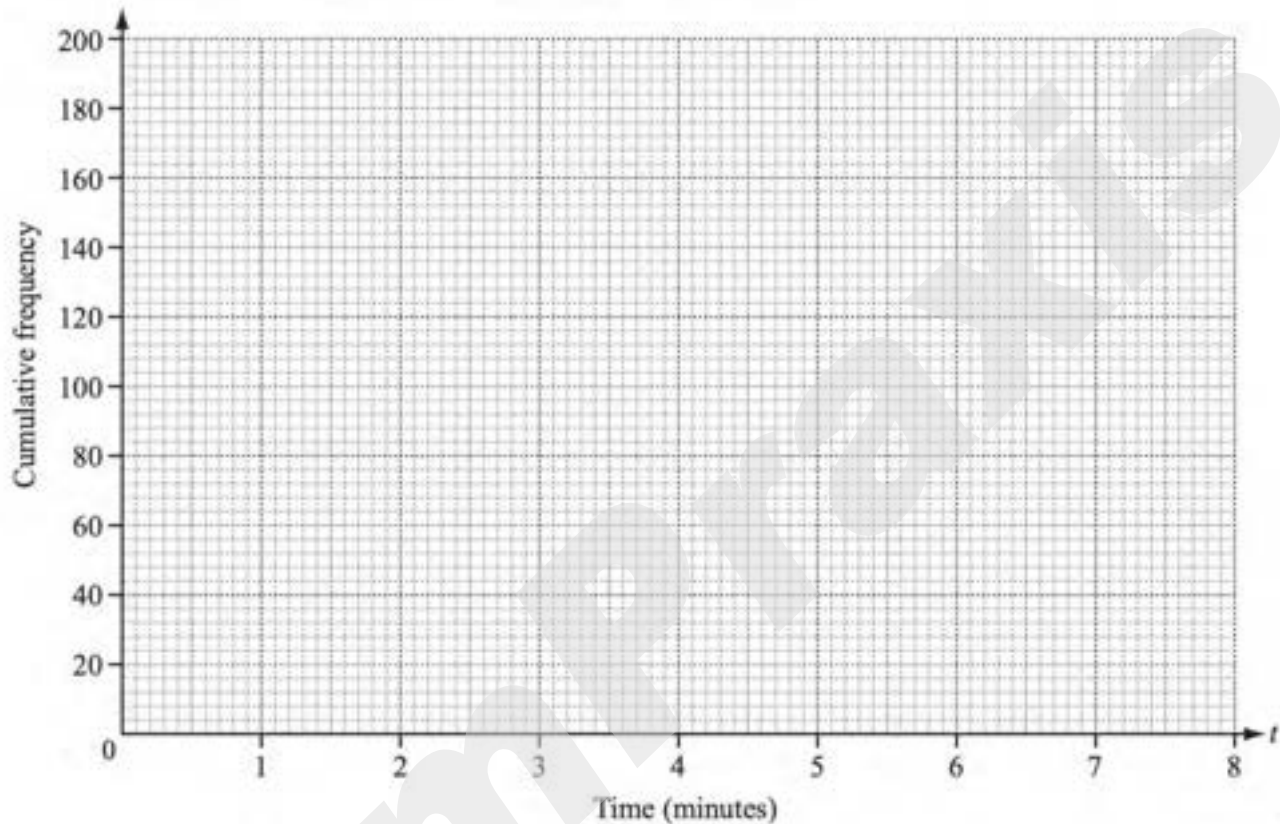
Answer(b) min [4]

- (c) (i) Use the information in the table opposite to complete the cumulative frequency table.

Time (t minutes)	$t \leq 2$	$t \leq 3$	$t \leq 4$	$t \leq 8$
Cumulative frequency	24			200

[1]

(ii) On the grid, draw a cumulative frequency diagram.



[3]

(iii) Use your diagram to find the median, the lower quartile and the inter-quartile range.

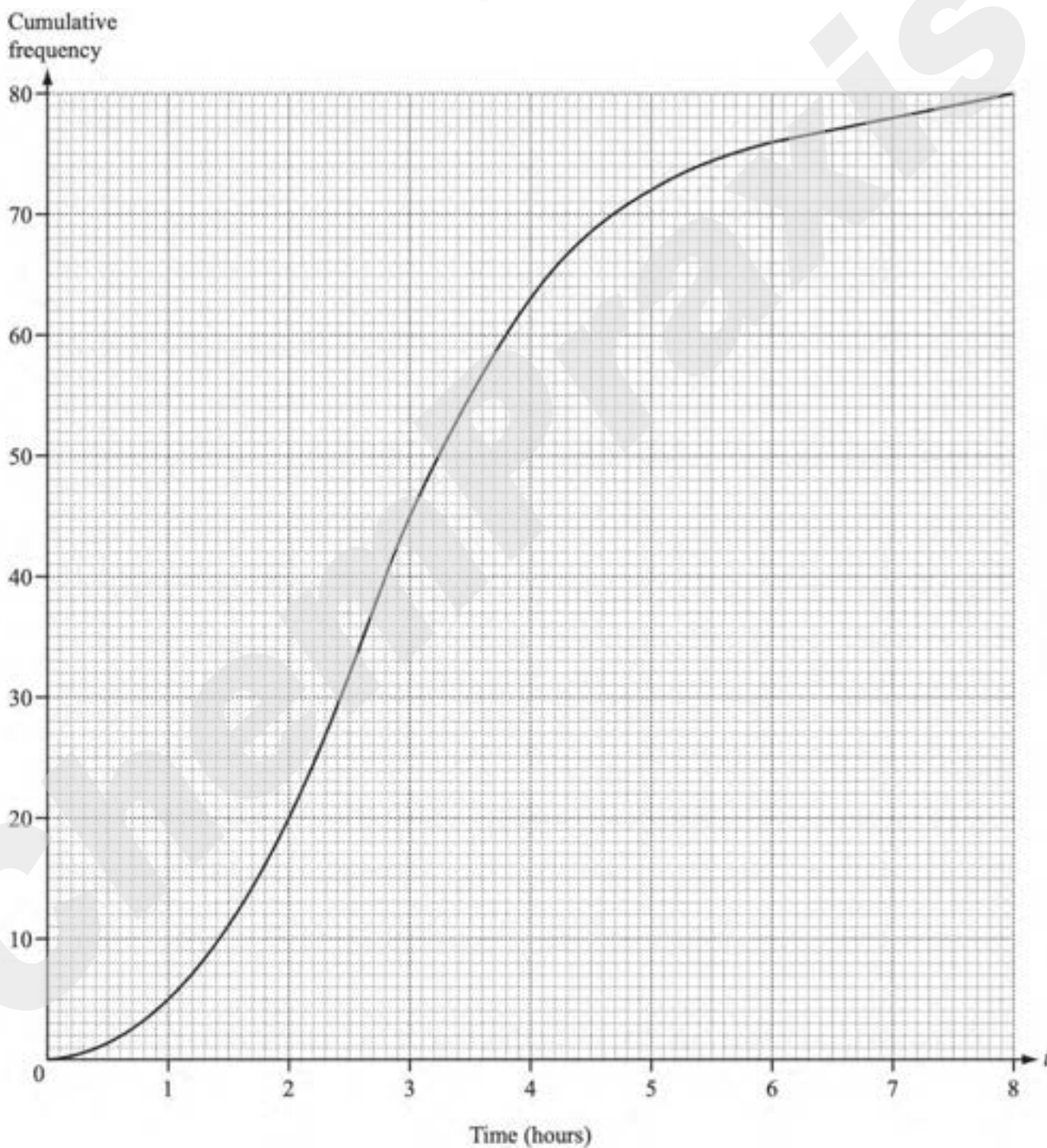
Answer(c)(iii) Median = min

Lower quartile = min

Inter-quartile range = min [3]

May/June 2012 (41)

- 5 Felix asked 80 motorists how many hours their journey took that day. He used the results to draw a cumulative frequency diagram.



(a) Find

(i) the median,

Answer(a)(i) h [1]

(ii) the upper quartile,

Answer(a)(ii) h [1]

(iii) the inter-quartile range.

Answer(a)(iii) h [1]

(b) Find the number of motorists whose journey took more than 5 hours but no more than 7 hours.

Answer(b) [1]

(c) The frequency table shows some of the information about the 80 journeys.

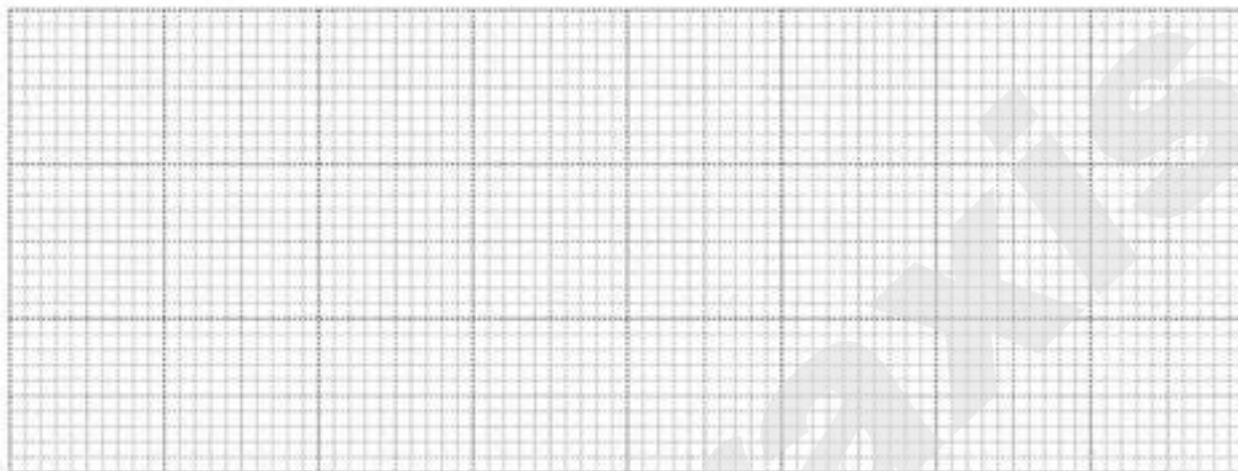
Time in hours (t)	$0 < t \leq 2$	$2 < t \leq 3$	$3 < t \leq 4$	$4 < t \leq 5$	$5 < t \leq 6$	$6 < t \leq 8$
Frequency	20	25	18			

(i) Use the cumulative frequency diagram to complete the table above. [2]

(ii) Calculate an estimate of the mean number of hours the 80 journeys took.

Answer(c)(ii) h [4]

(d) On the grid, draw a histogram to represent the information in your table in part (c).



[5]

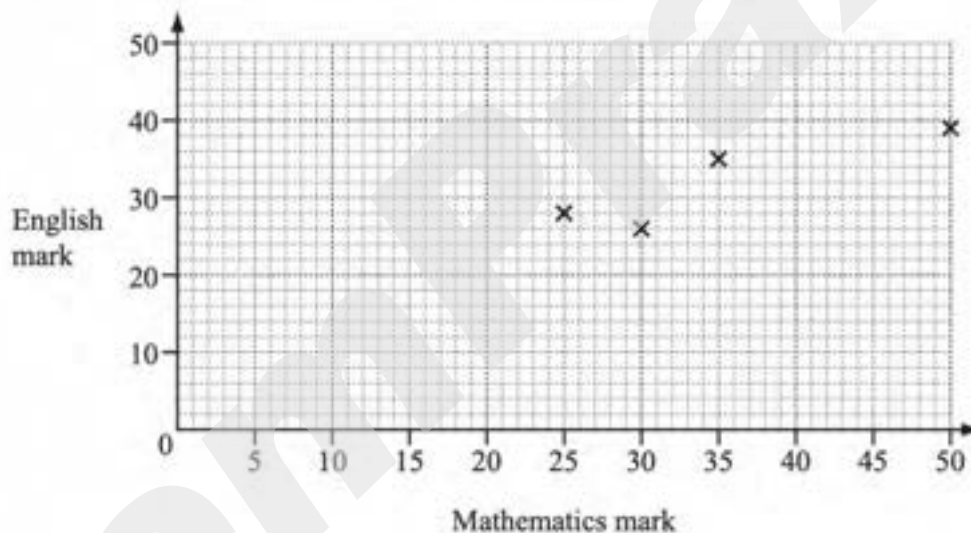
May/June 2012 (42)

1

Mathematics mark	30	50	35	25	5	39	48	40	10	15
English mark	26	39	35	28	9	37	45	33	16	12

The table shows the test marks in Mathematics and English for 10 students.

- (a) (i) On the grid, complete the scatter diagram to show the Mathematics and English marks for the 10 students. The first four points have been plotted for you.



- (ii) What type of correlation does your scatter diagram show? [2]

Answer(a)(ii) [1]

- (iii) Draw a line of best fit on the grid. [1]

- (iv) Ann missed the English test but scored 22 marks in the Mathematics test. Use your line of best fit to estimate a possible English mark for Ann.

Answer(a)(iv) [1]

(b) Show that the mean English mark for the 10 students is 28.

Answer(b)

[2]

(c) Two new students do the English test. They both score the **same** mark.
The mean English mark for the 12 students is 31.
Calculate the English mark for the new students.

Answer(c) [3]

May/June 2012 (43)

4 (a) In a football league a team is given 3 points for a win, 1 point for a draw and 0 points for a loss.

The table shows the 20 results for Athletico Cambridge.

Points	3	1	0
Frequency	10	3	7

(i) Find the median and the mode.

Answer(a)(i) Median =

Mode = [3]

(ii) Thomas wants to draw a pie chart using the information in the table.

Calculate the angle of the sector which shows the number of times Athletico Cambridge were given 1 point.

Answer(a)(ii) [2]

- (b) Athletico Cambridge has 20 players.

The table shows information about the heights (h centimetres) of the players.

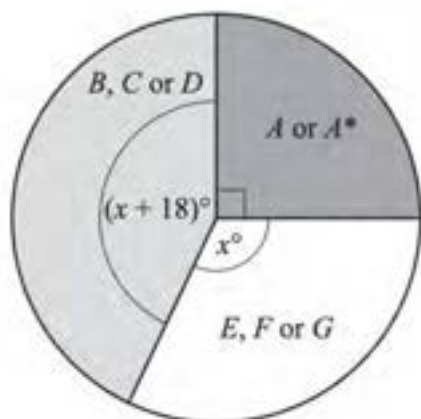
Height (h cm)	$170 < h \leq 180$	$180 < h \leq 190$	$190 < h \leq 200$
Frequency	5	12	3

Calculate an estimate of the mean height of the players.

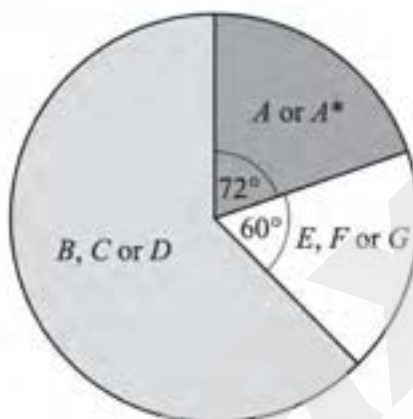
Answer(b) cm [4]

October/November 2012 (41)

1



Girls



Boys

NOT TO SCALE

The pie charts show information on the grades achieved in mathematics by the girls and boys at a school.

(a) For the **Girls'** pie chart, calculate

(i) x ,

Answer(a)(i) $x =$ [2]

(ii) the angle for grades B, C or D .

Answer(a)(ii) [1]

(b) Calculate the percentage of the **Boys** who achieved grades E, F or G .

Answer(b) % [2]

(c) There were 140 girls and 180 boys.

(i) Calculate the percentage of students (girls and boys) who achieved grades *A* or *A**.

Answer(c)(i) % [3]

(ii) How many more boys than girls achieved grades *B*, *C* or *D*?

Answer(c)(ii) [2]

- (d) The table shows information about the times, t minutes, taken by 80 of the girls to complete their mathematics examination.

Time taken (t minutes)	$40 < t \leq 60$	$60 < t \leq 80$	$80 < t \leq 120$	$120 < t \leq 150$
Frequency	5	14	29	32

- (i) Calculate an estimate of the mean time taken by these 80 girls to complete the examination.

Answer(d)(i) min [4]

- (ii) On a histogram, the height of the column for the interval $60 < t \leq 80$ is 2.8 cm.

Calculate the heights of the other three columns.

Do not draw the histogram.

Answer(d)(ii) $40 < t \leq 60$ column height = cm

$80 < t \leq 120$ column height = cm

$120 < t \leq 150$ column height = cm [4]

October/November 2012 (42)

- 5 (a) A farmer takes a sample of 158 potatoes from his crop. He records the mass of each potato and the results are shown in the table.

Mass (m grams)	Frequency
$0 < m \leq 40$	6
$40 < m \leq 80$	10
$80 < m \leq 120$	28
$120 < m \leq 160$	76
$160 < m \leq 200$	22
$200 < m \leq 240$	16

Calculate an estimate of the mean mass.
Show all your working.

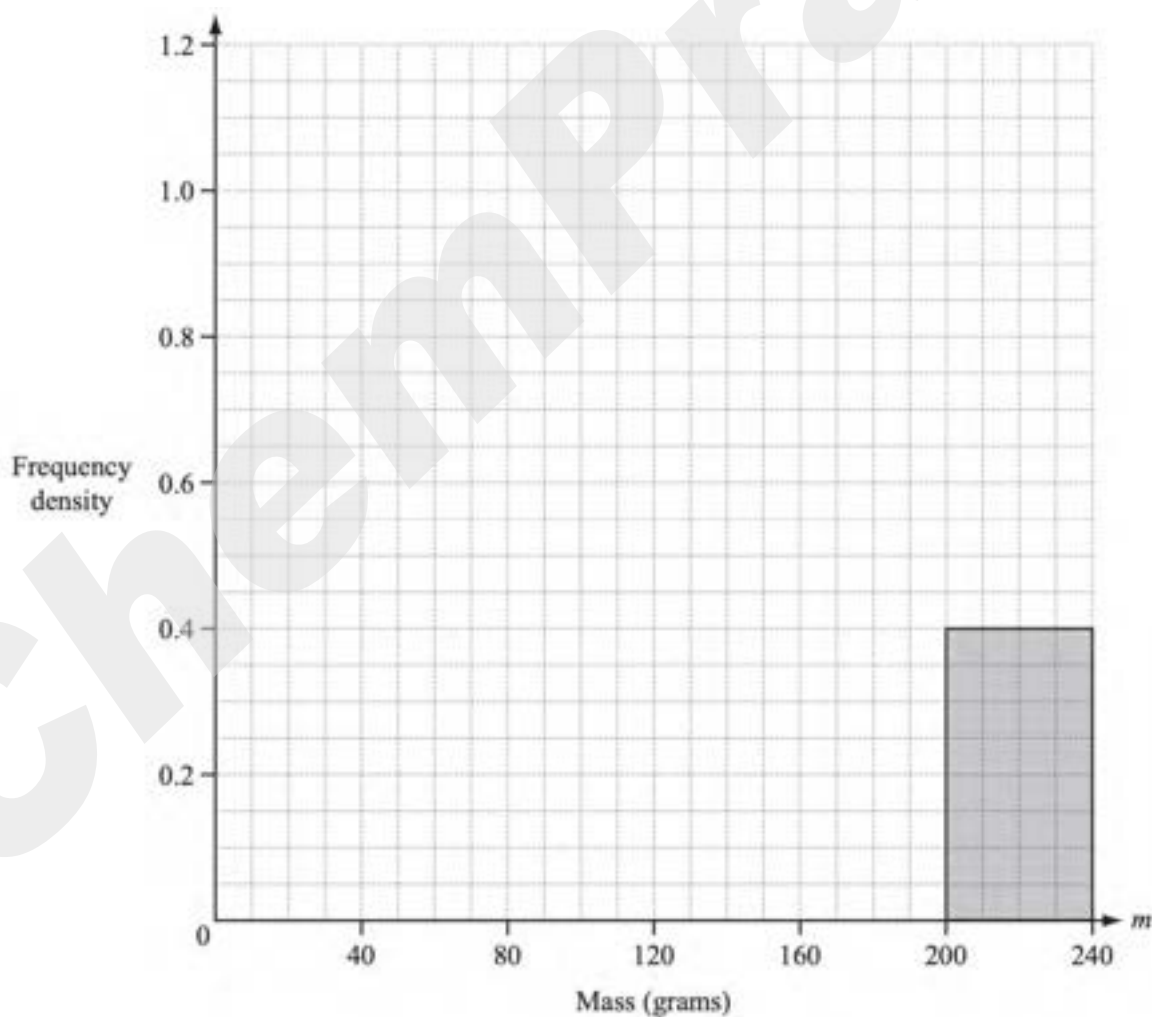
Answer(a) g [4]

(b) A new frequency table is made from the results shown in the table in part (a).

Mass (m grams)	Frequency
$0 < m \leq 80$	
$80 < m \leq 200$	
$200 < m \leq 240$	16

(i) Complete the table above. [2]

(ii) On the grid opposite, complete the histogram to show the information in this new table.



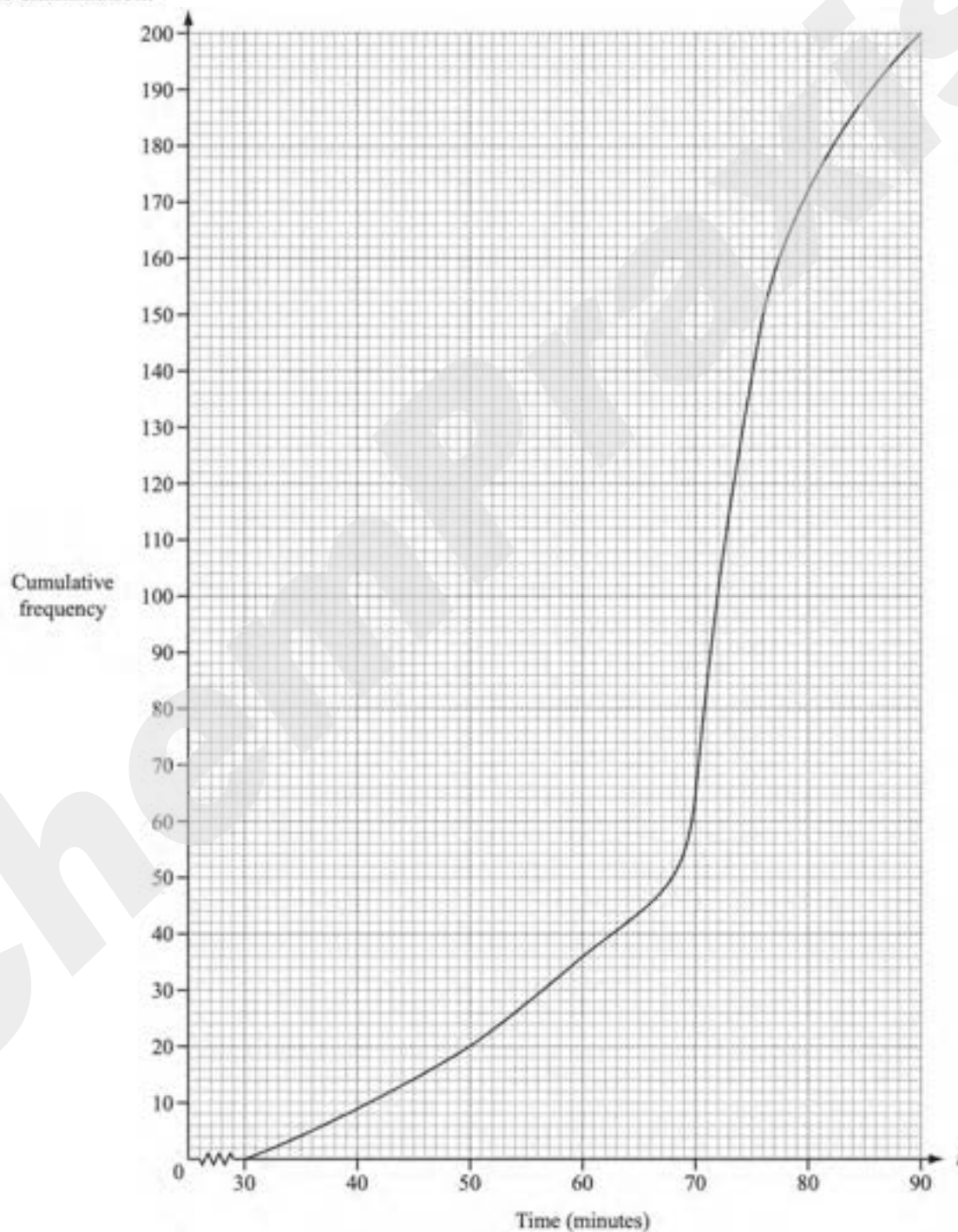
- (c) A bag contains 15 potatoes which have a mean mass of 136 g.
The farmer puts 3 potatoes which have a mean mass of 130 g into the bag.

Calculate the mean mass of all the potatoes in the bag.

Answer(c) g [3]

October/November 2012 (43)

- 9 200 students take a Mathematics examination. The cumulative frequency diagram shows information about the times taken, t minutes, to complete the examination.



(a) Find

(i) the median,

Answer(a)(i) min [1]

(ii) the lower quartile,

Answer(a)(ii) min [1]

(iii) the inter-quartile range,

Answer(a)(iii) min [1]

(iv) the number of students who took more than 1 hour.

Answer(a)(iv) [2]

(b) (i) Use the cumulative frequency diagram to complete the grouped frequency table.

Time, t minutes	$30 < t \leq 40$	$40 < t \leq 50$	$50 < t \leq 60$	$60 < t \leq 70$	$70 < t \leq 80$	$80 < t \leq 90$
Frequency	9		16	28	108	28

[1]

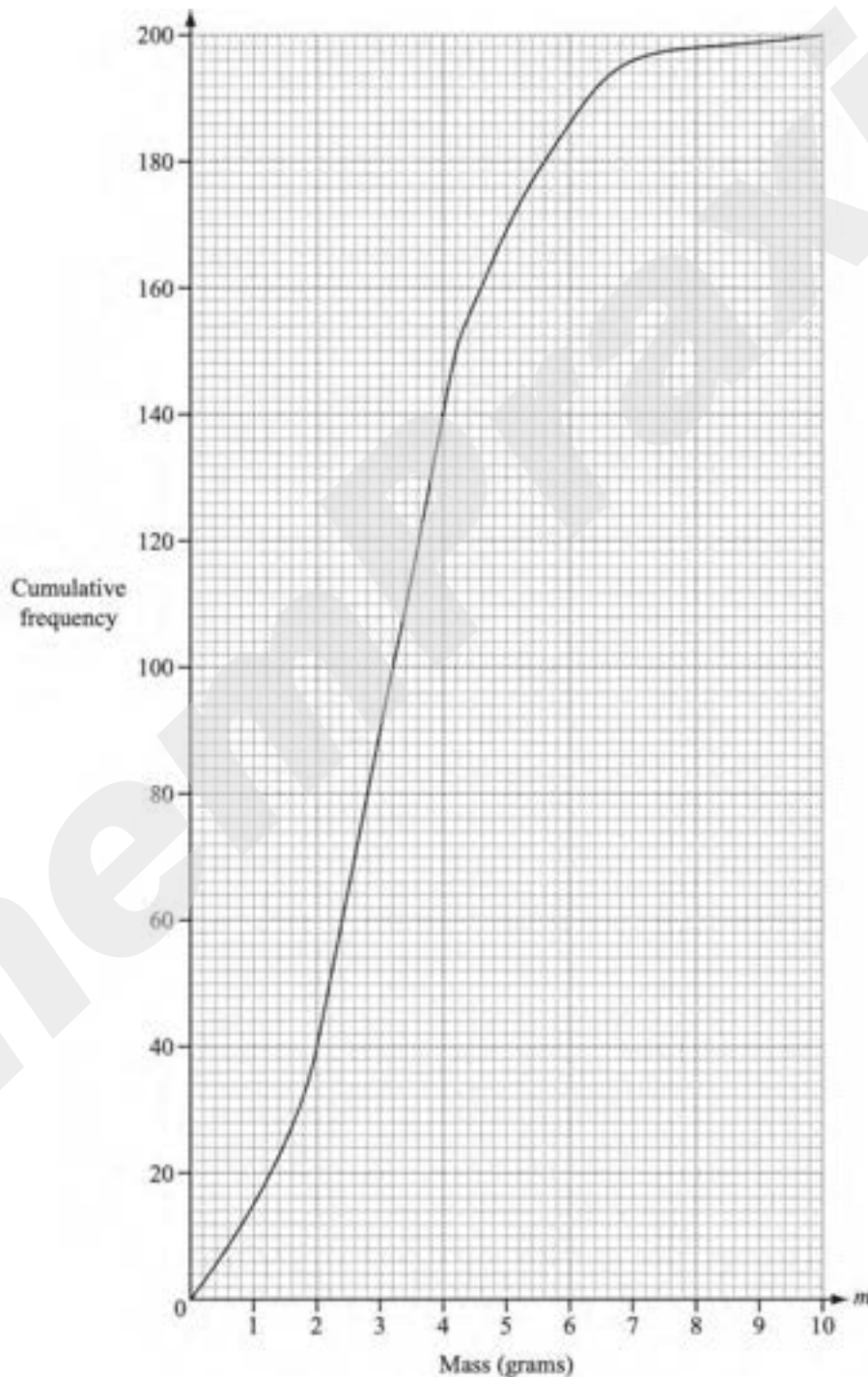
(ii) Calculate an estimate of the mean time taken by the 200 students to complete the examination.

Show all your working.

Answer(b)(ii) min [4]

May/June 2013 (41)

- 3 200 students estimate the mass (m grams) of a coin.
The cumulative frequency diagram shows the results.



(a) Find

(i) the median,

Answer(a)(i) g [1]

(ii) the upper quartile,

Answer(a)(ii) g [1]

(iii) the 80th percentile,

Answer(a)(iii) g [1]

(iv) the number of students whose estimate is 7 g or less.

Answer(a)(iv) [1]

(b) (i) Use the cumulative frequency diagram to complete the frequency table.

Mass (m grams)	$0 < m \leq 2$	$2 < m \leq 4$	$4 < m \leq 6$	$6 < m \leq 8$	$8 < m \leq 10$
Frequency	40				2

[2]

(ii) A student is chosen at random.

The probability that the student estimates that the mass is greater than M grams is 0.3.

Find the value of M .

Answer(b)(ii) $M =$ [2]

5

Height (h cm)	$150 < h \leq 160$	$160 < h \leq 165$	$165 < h \leq 180$	$180 < h \leq 190$
Frequency	5	9	18	10

The table shows information about the heights of a group of 42 students.

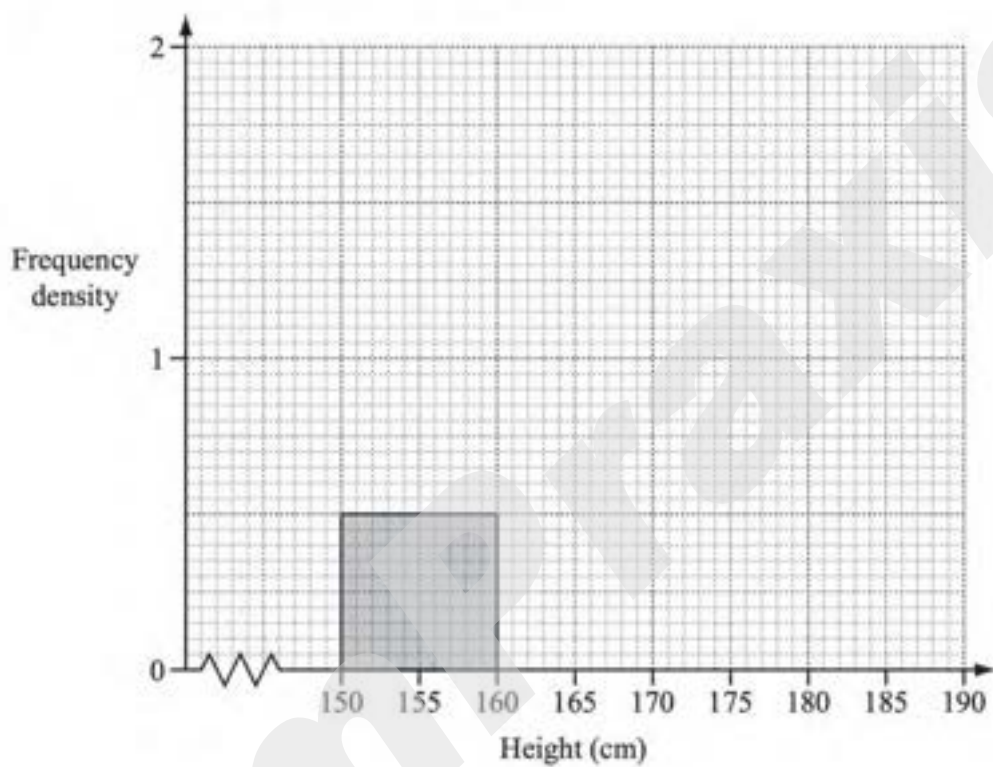
- (a) Using mid-interval values, calculate an estimate of the mean height of the students.
Show your working.

Answer(a) cm [3]

- (b) Write down the interval which contains the lower quartile.

Answer(b) [1]

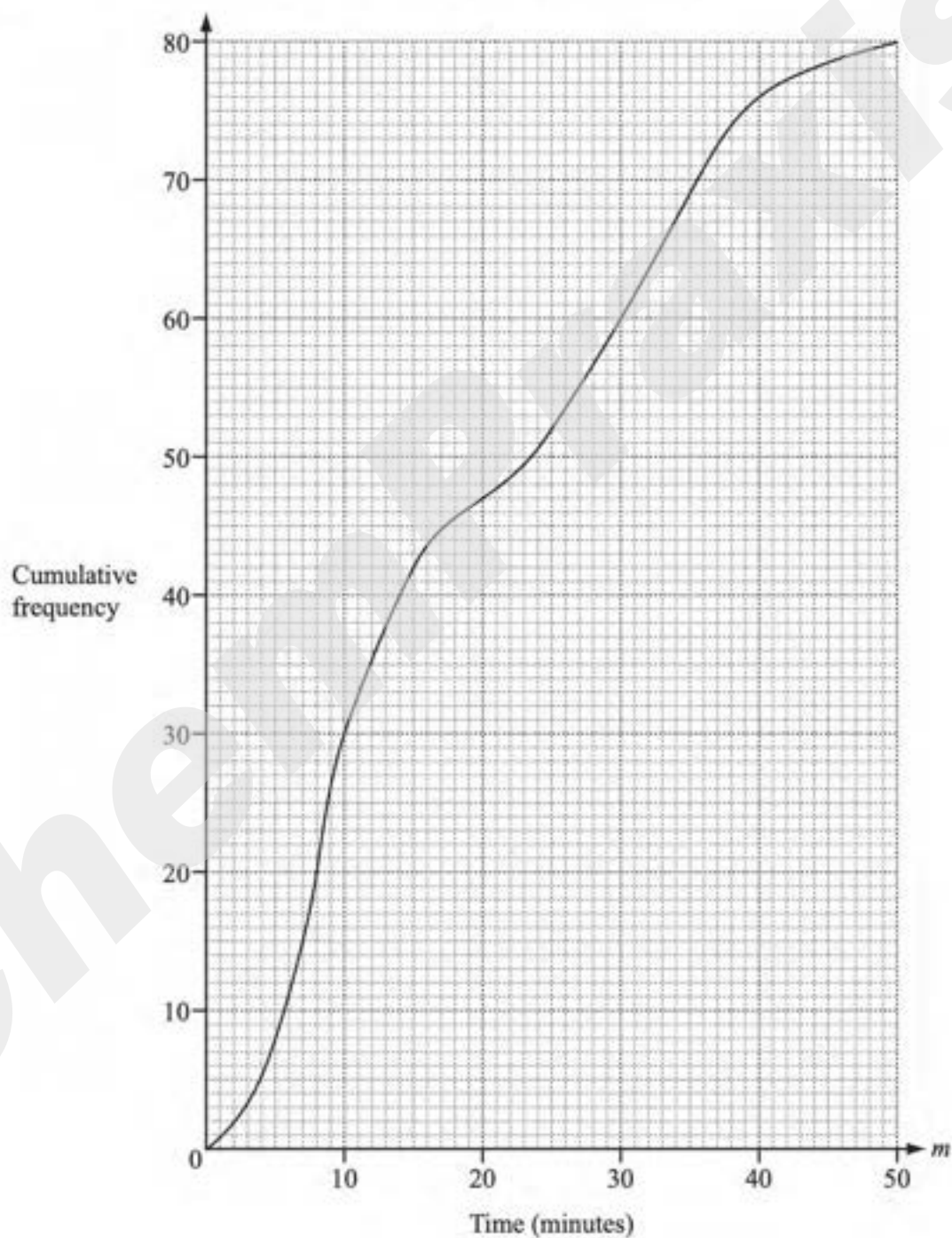
- (c) Complete the histogram to show the information in the table.
One column has already been drawn for you.



[4]

May/June 2013 (43)

- 9 Sam asked 80 people how many minutes their journey to work took on one day. The cumulative frequency diagram shows the times taken (m minutes).



(a) Find

(i) the median,

Answer(a)(i) min [1]

(ii) the lower quartile,

Answer(a)(ii) min [1]

(iii) the inter-quartile range.

Answer(a)(iii) min [1]

(b) One of the 80 people is chosen at random.

Find the probability that their journey to work took more than 35 minutes.
Give your answer as a fraction.

Answer(b) [2]

(c) Use the cumulative frequency diagram to complete this frequency table.

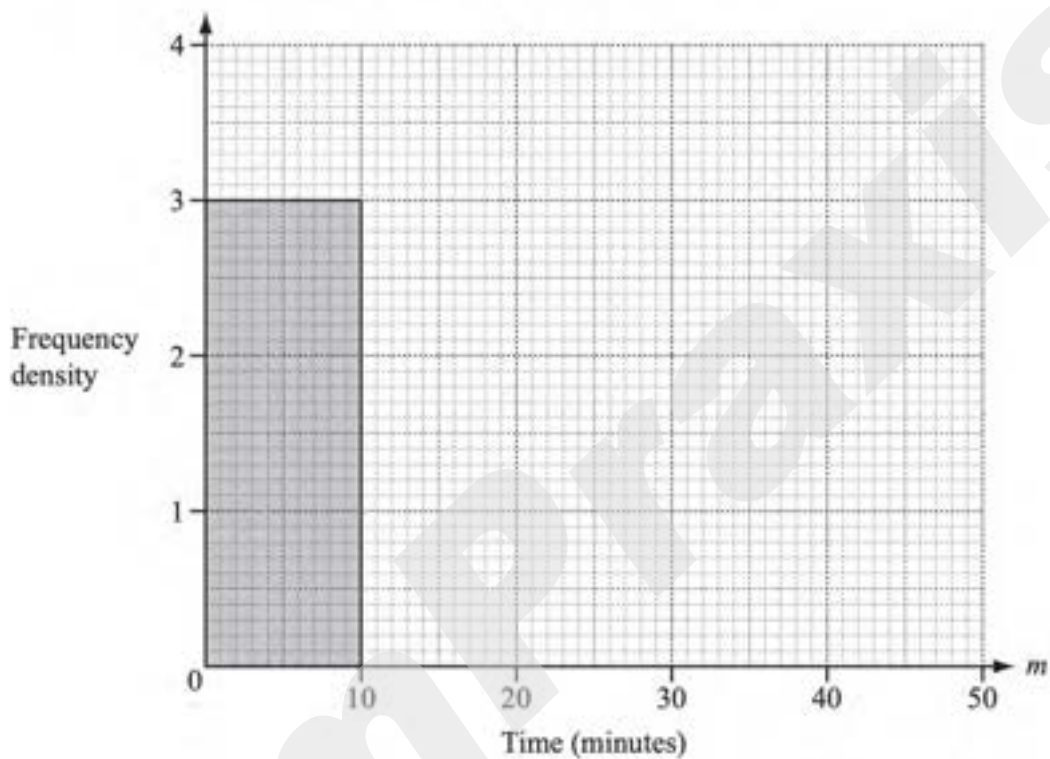
Time (m minutes)	$0 < m \leq 10$	$10 < m \leq 15$	$15 < m \leq 30$	$30 < m \leq 40$	$40 < m \leq 50$
Frequency	30	12	18		

[2]

(d) Using mid-interval values, calculate an estimate of the mean journey time for the 80 people.

Answer(d) min [3]

- (e) Use the table in **part (c)** to complete the histogram to show the times taken by the 80 people. One column has already been completed for you.



[5]

October/November 2013 (41)

- 7 120 students are asked to answer a question.
The time, t seconds, taken by each student to answer the question is measured.
The frequency table shows the results.

Time	$0 < t \leq 10$	$10 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 40$	$40 < t \leq 50$	$50 < t \leq 60$
Frequency	6	44	40	14	10	6

- (a) Calculate an estimate of the mean time.

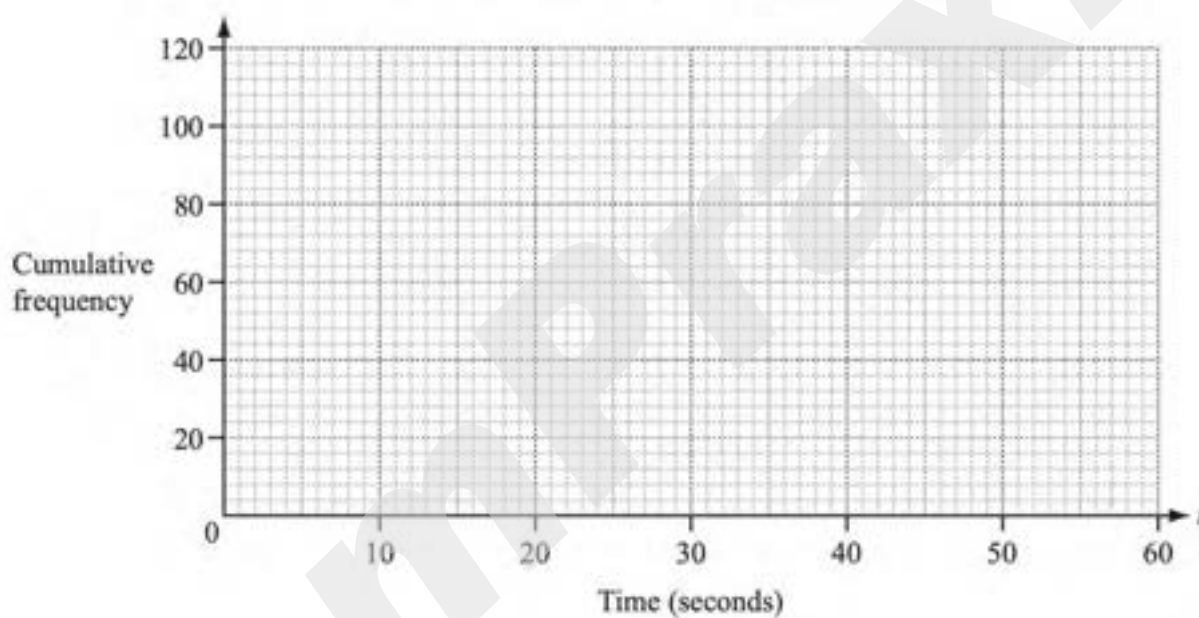
Answer(a) s [4]

(b) (i) Complete the cumulative frequency table.

Time	$t \leq 10$	$t \leq 20$	$t \leq 30$	$t \leq 40$	$t \leq 50$	$t \leq 60$
Cumulative frequency	6			104		120

[2]

(ii) On the grid below, draw a cumulative frequency diagram to show this information.



[3]

(iii) Use your cumulative frequency diagram to find the median, the lower quartile and the 60th percentile.

Answer(b)(iii) Median s

Lower quartile s

60th percentile s [4]

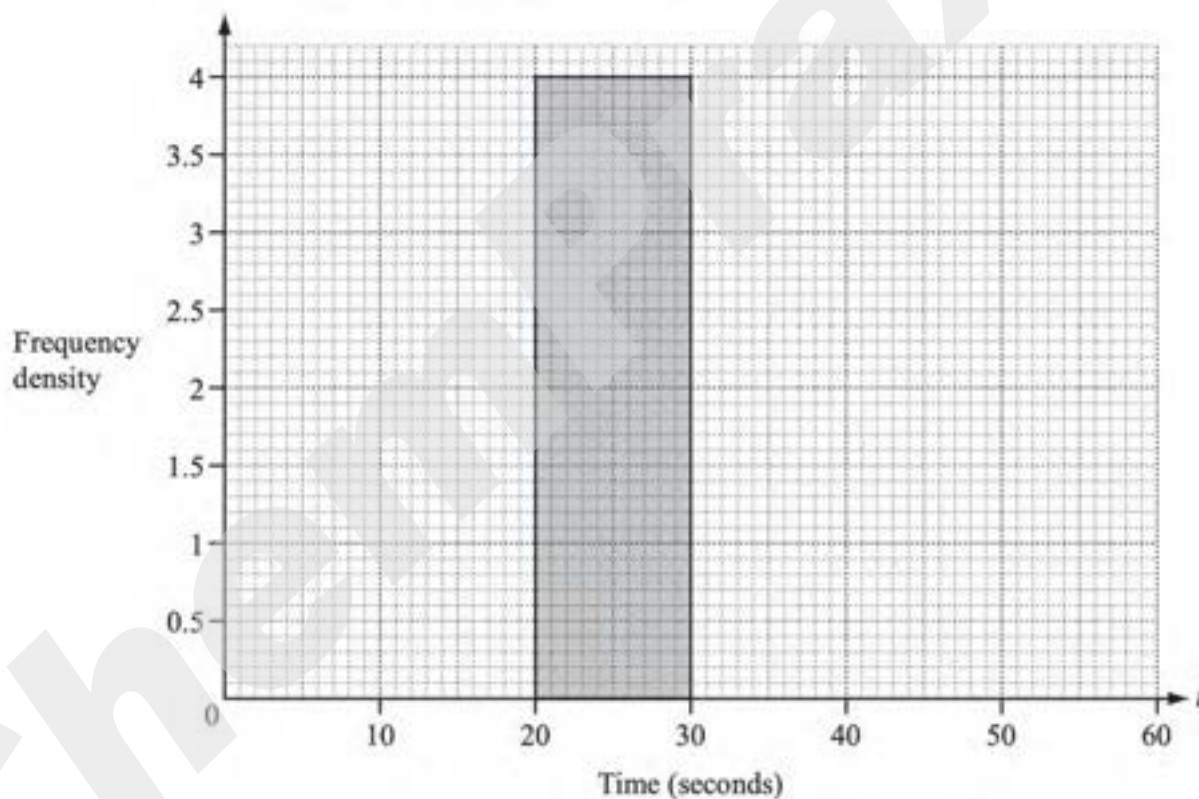
(c) The intervals for the times taken are changed.

(i) Use the information in the **frequency table** on the opposite page to complete this new table.

Time	$0 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 60$
Frequency		40	

[2]

(ii) On the grid below, complete the histogram to show the information in the new table. One column has already been drawn for you.



[3]

October/November 2013 (43)

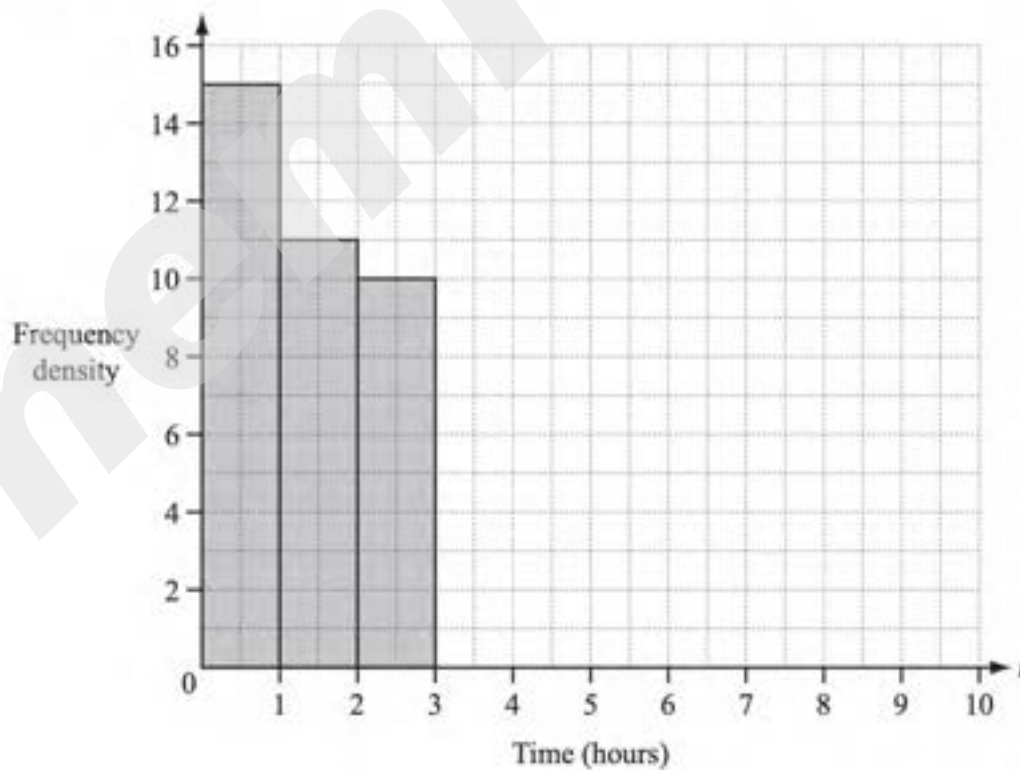
- 5 (a) 80 students were asked how much time they spent on the internet in one day.
This table shows the results.

Time (t hours)	$0 < t \leq 1$	$1 < t \leq 2$	$2 < t \leq 3$	$3 < t \leq 5$	$5 < t \leq 7$	$7 < t \leq 10$
Number of students	15	11	10	19	13	12

- (i) Calculate an estimate of the mean time spent on the internet by the 80 students.

Answer(a)(i) hours [4]

- (ii) On the grid, complete the histogram to show this information.

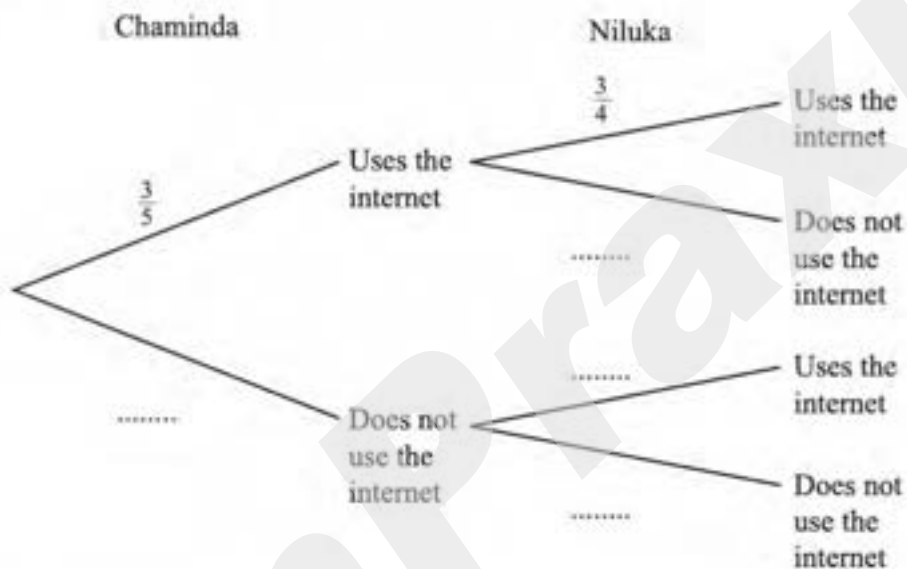


[4]

(b) The probability that Chaminda uses the internet on any day is $\frac{3}{5}$.

The probability that Niluka uses the internet on any day is $\frac{3}{4}$.

(i) Complete the tree diagram.



[2]

(ii) Calculate the probability, that on any day, at least one of the two students uses the internet.

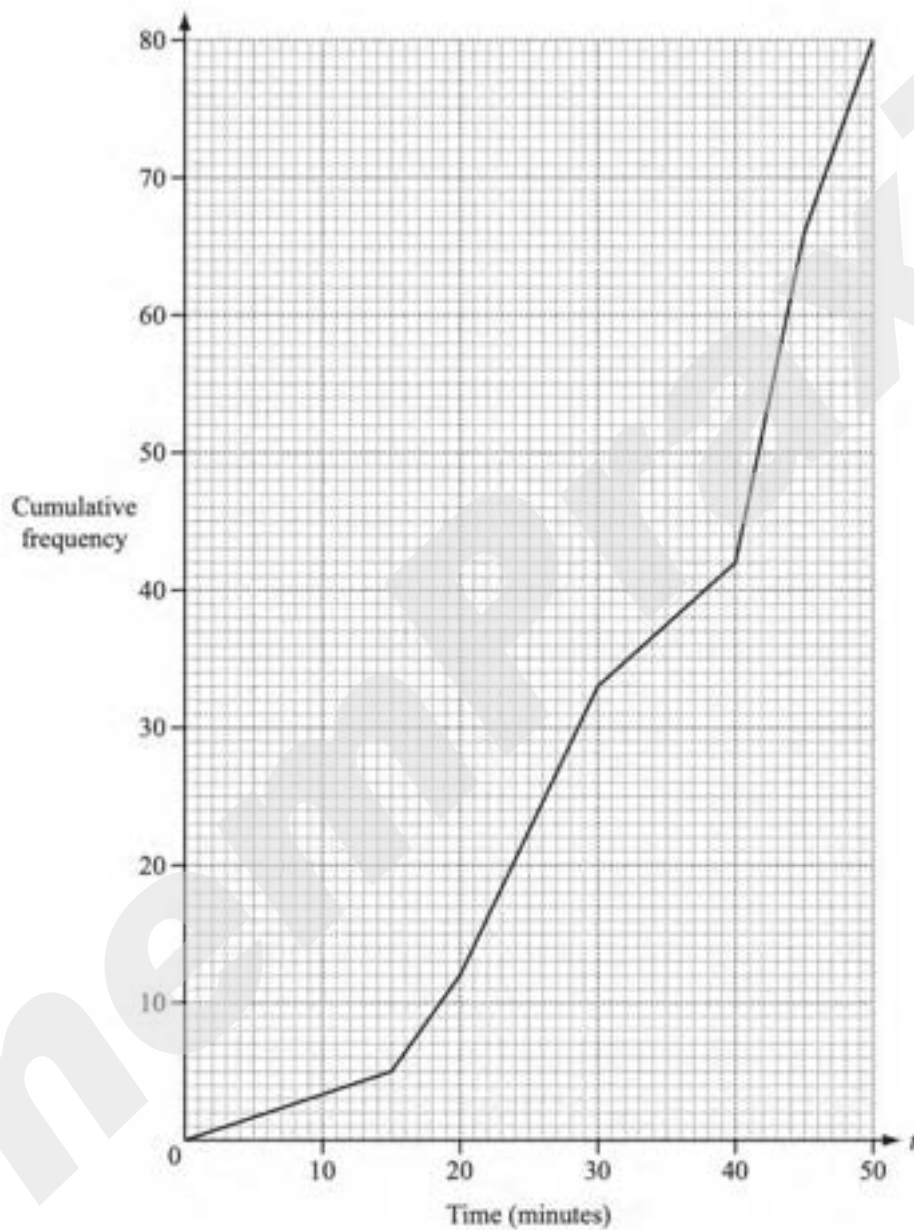
Answer(b)(ii) [3]

(iii) Calculate the probability that Chaminda uses the internet on three consecutive days.

Answer(b)(iii) [2]

May/June 2014 (41)

9



The times (t minutes) taken by 80 people to complete a charity swim were recorded. The results are shown in the cumulative frequency diagram above.

(a) Find

(i) the median,

Answer(a)(i) min [1]

(ii) the inter-quartile range,

Answer(a)(ii) min [2]

(iii) the 70th percentile.

Answer(a)(iii) min [2]

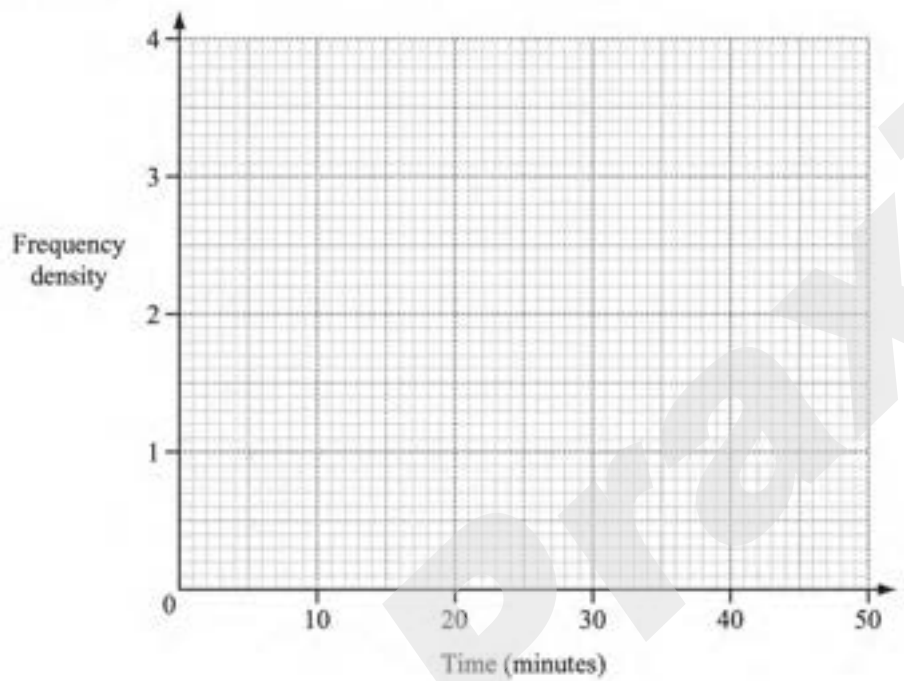
(b) The times taken by the 80 people are shown in this grouped frequency table.

Time (t minutes)	$0 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 45$	$45 < t \leq 50$
Frequency	12	21	33	14

(i) Calculate an estimate of the mean time.

Answer(b)(i) min [4]

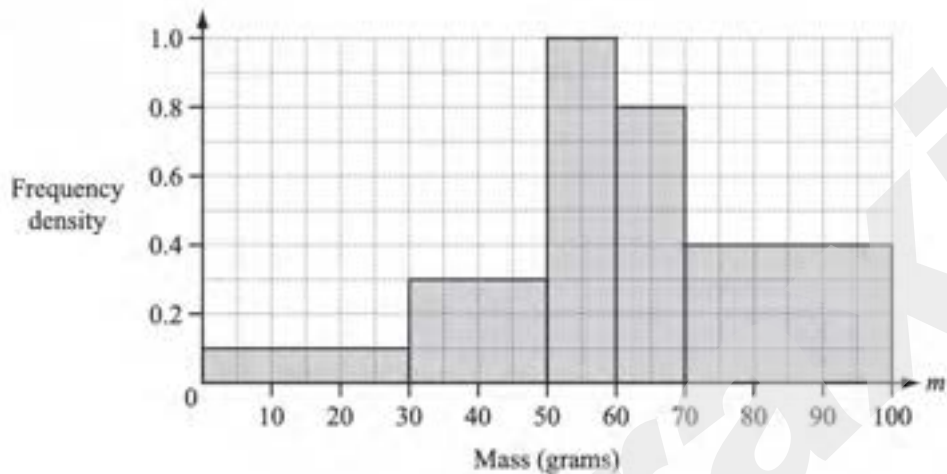
(ii) Draw a histogram to represent the grouped frequency table.



[4]

May/June 2014 (42)

7 (a)



The histogram shows some information about the masses (m grams) of 39 apples.

(i) Show that there are 12 apples in the interval $70 < m \leq 100$.

Answer(a)(i)

[1]

(ii) Calculate an estimate of the mean mass of the 39 apples.

Answer(a)(ii) g [5]

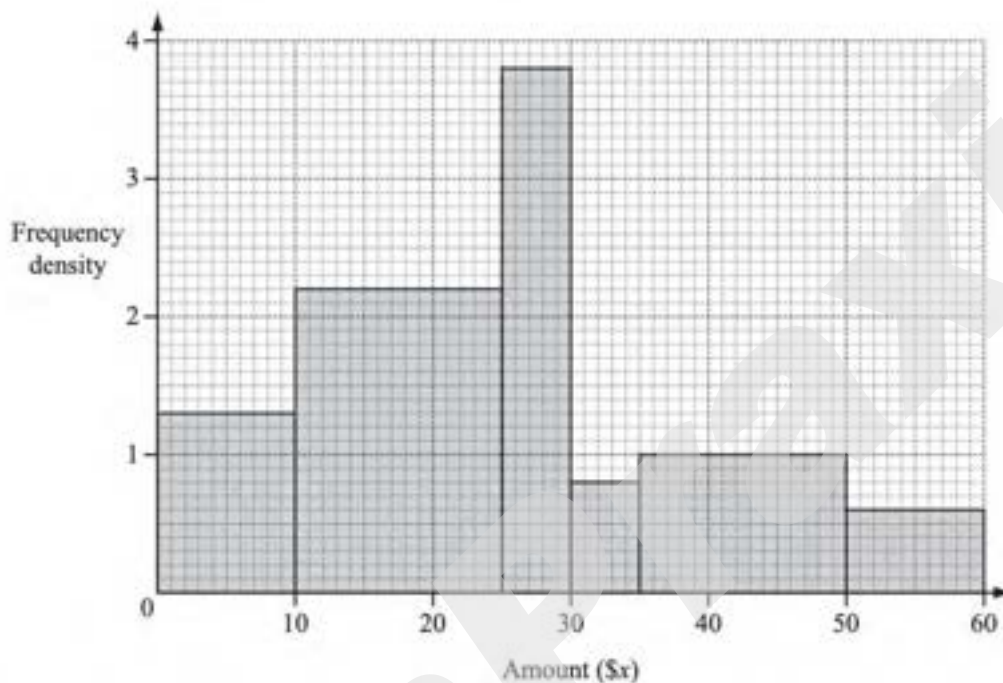
- (b) The mean mass of 20 oranges is 70 g.
One orange is eaten.
The mean mass of the remaining oranges is 70.5 g.

Find the mass of the orange that was eaten.

Answer(b) g [3]

May/June 2014 (43)

2



A survey asked 90 people how much money they gave to charity in one month. The histogram shows the results of the survey.

(a) Complete the frequency table for the six columns in the histogram.

Amount (\$x)	$0 < x \leq 10$				
Frequency			4		

[5]

(b) Use your frequency table to calculate an estimate of the mean amount these 90 people gave to charity.

Answer(b) \$ [4]

October/November 2014 (41)

- 6 A company tested 200 light bulbs to find the lifetime, T hours, of each bulb. The results are shown in the table.

Lifetime (T hours)	Number of bulbs
$0 < T \leq 1000$	10
$1000 < T \leq 1500$	30
$1500 < T \leq 2000$	55
$2000 < T \leq 2500$	72
$2500 < T \leq 3500$	33

- (a) Calculate an estimate of the mean lifetime for the 200 light bulbs.

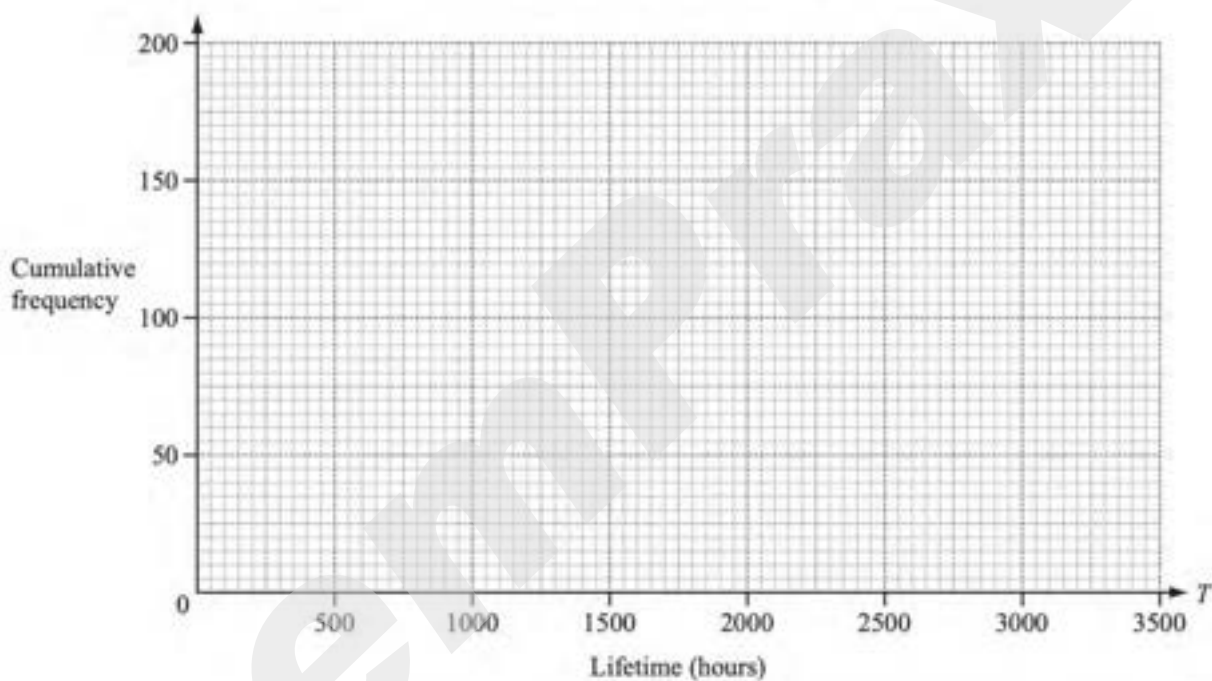
Answer(a) hours [4]

(b) (i) Complete the cumulative frequency table.

Lifetime (T hours)	$T \leq 1000$	$T \leq 1500$	$T \leq 2000$	$T \leq 2500$	$T \leq 3500$
Number of bulbs					

[2]

(ii) On the grid, draw a cumulative frequency diagram to show this information.



[3]

(iii) The company says that the average lifetime of a bulb is 2200 hours.

Estimate the number of bulbs that lasted longer than 2200 hours.

Answer(b)(iii) [2]

October/November 2014 (42)

- 3 The time, t seconds, taken for each of 50 chefs to cook an omelette is recorded.

Time (t seconds)	$20 < t \leq 25$	$25 < t \leq 30$	$30 < t \leq 35$	$35 < t \leq 40$	$40 < t \leq 45$	$45 < t \leq 50$
Frequency	2	6	7	19	9	7

- (a) Write down the modal time interval.

Answer(a) s [1]

- (b) Calculate an estimate of the mean time.
Show all your working.

Answer(b) s [4]

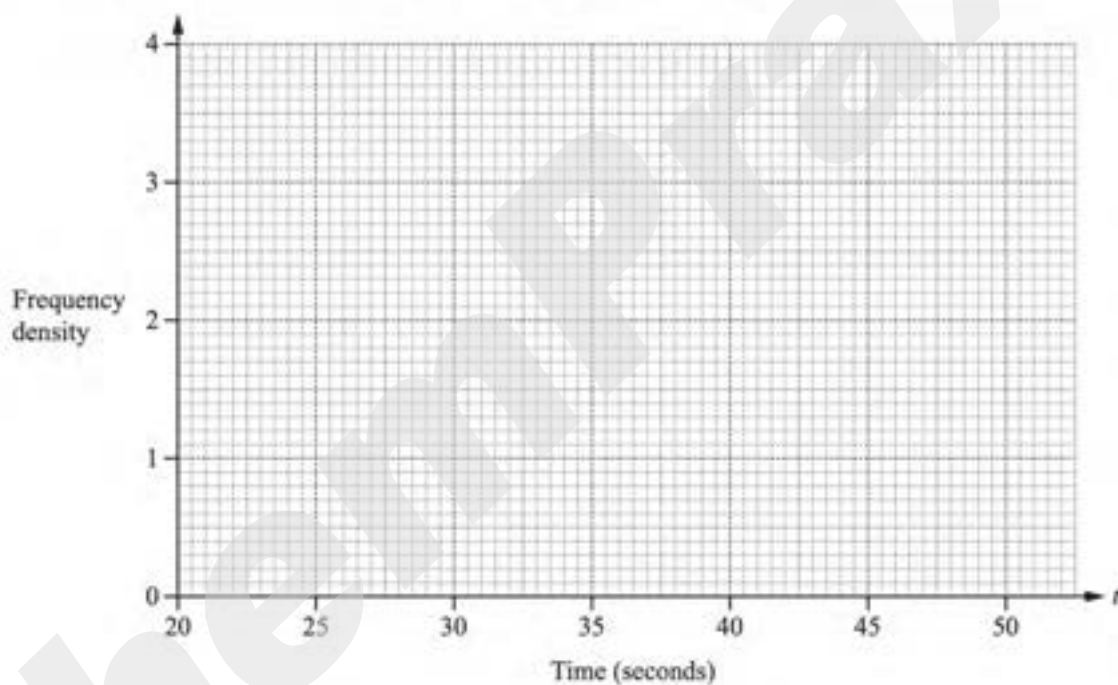
(c) A new frequency table is made from the results shown in the table opposite.

Time (t seconds)	$20 < t \leq 35$	$35 < t \leq 40$	$40 < t \leq 50$
Frequency			

(i) Complete the table.

[1]

(ii) On the grid, draw a histogram to show the information in this new table.



[3]

October/November 2014 (43)

- 9 (a) Ricardo asks some motorists how many litres of fuel they use in one day. The numbers of litres, correct to the nearest litre, are shown in the table.

Number of litres	16	17	18	19	20
Number of motorists	11	10	p	4	8

- (i) For this table, the mean number of litres is 17.7.

Calculate the value of p .

Answer(a)(i) $p =$ [4]

- (ii) Find the median number of litres.

Answer(a)(ii) litres [1]

February/March 2015 (42)

- 9 The table shows the height, h cm, of 40 children in a class.

Height (h cm)	$120 < h \leq 130$	$130 < h \leq 140$	$140 < h \leq 144$	$144 < h \leq 150$	$150 < h \leq 170$
Frequency	3	14	4	6	13

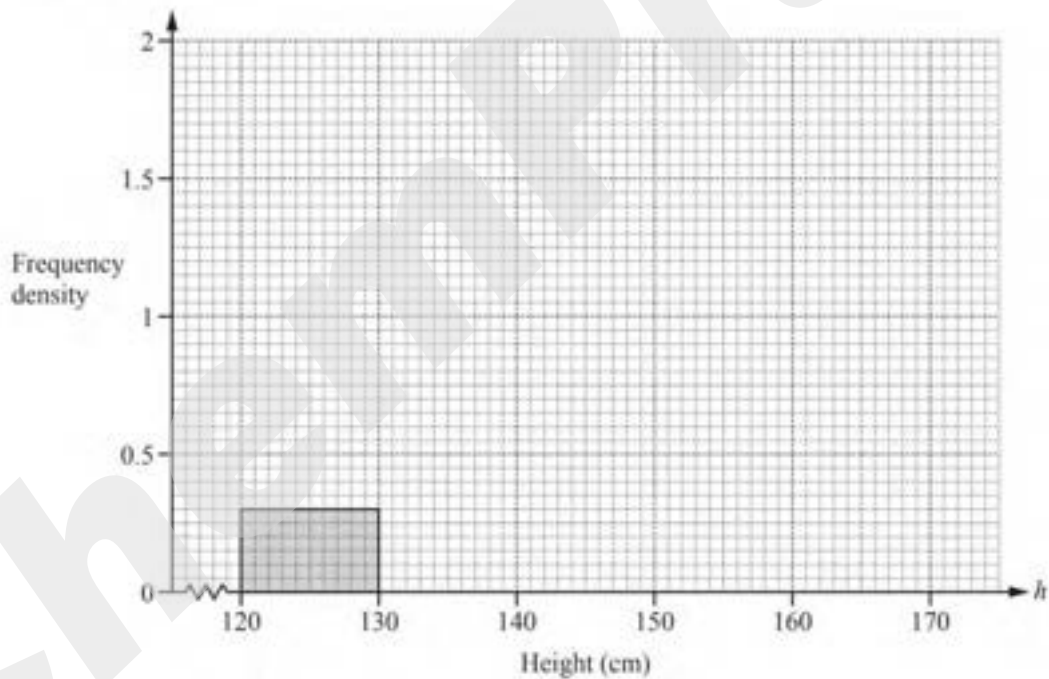
- (a) Write down the class interval containing the median.

Answer(a) $< h \leq$ [1]

(b) Calculate an estimate of the mean height.

Answer(b) cm [4]

(c) Complete the histogram.



[4]

May/June 2015 (41)

- 6 The table shows the time, t minutes, that 400 people take to complete a test.

Time taken (t mins)	$0 < t \leq 10$	$10 < t \leq 24$	$24 < t \leq 30$	$30 < t \leq 40$	$40 < t \leq 60$	$60 < t \leq 70$
Frequency	10	90	135	85	70	10

- (a) (i) Write down the modal time interval.

Answer(a)(i) min [1]

- (ii) Calculate an estimate of the mean time taken to complete the test.

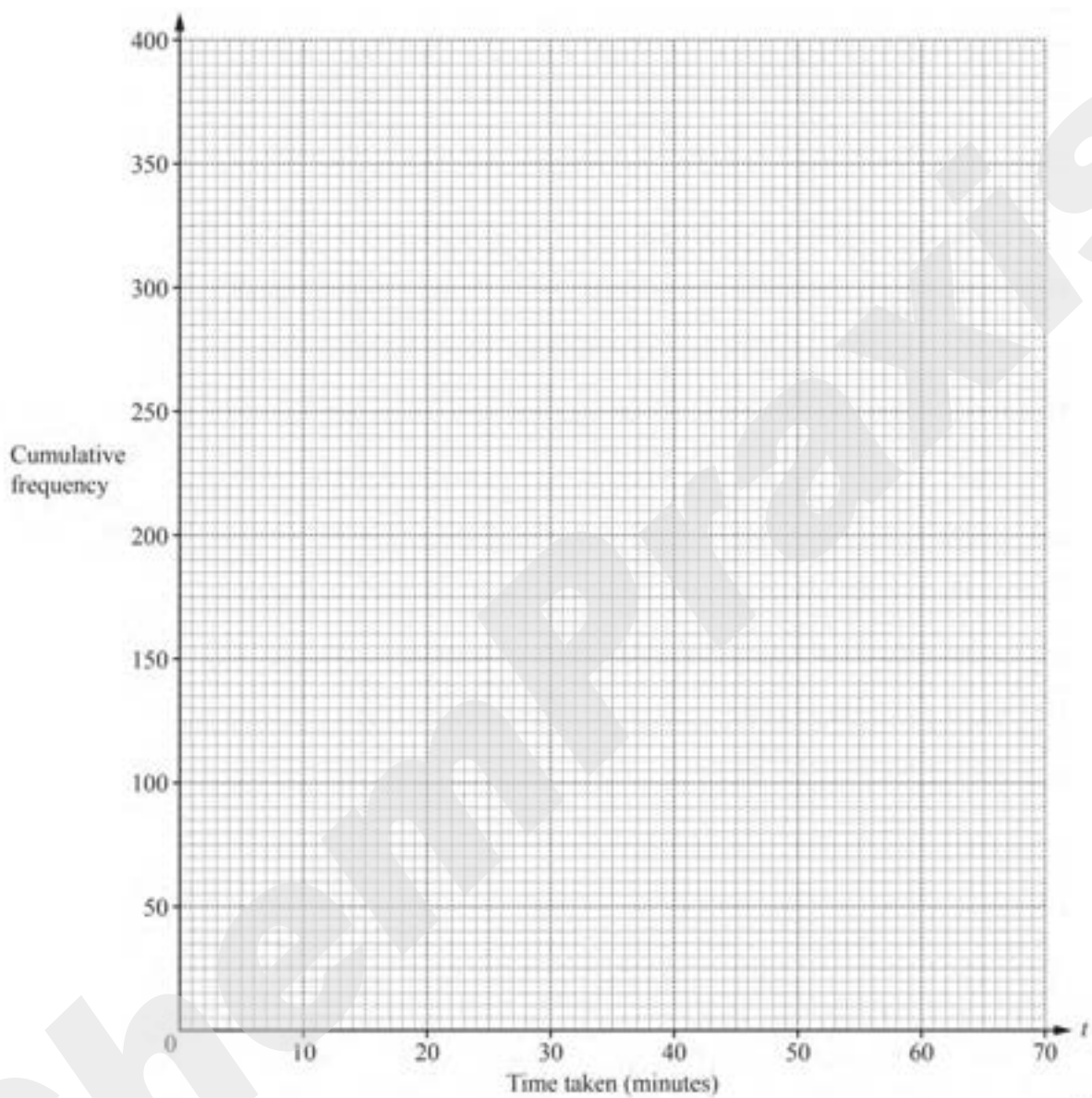
Answer(a)(ii) min [4]

- (b) (i) Complete the table of cumulative frequencies.

Time taken (t mins)	$t \leq 10$	$t \leq 24$	$t \leq 30$	$t \leq 40$	$t \leq 60$	$t \leq 70$
Cumulative frequency	10	100				400

[2]

- (ii) On the grid opposite, draw a cumulative frequency diagram to show this information.



[3]

(c) Use your graph to estimate

(i) the median time,

Answer(c)(i) min [1]

(ii) the inter-quartile range,

Answer(c)(ii) min [2]

(iii) the 15th percentile,

Answer(c)(iii) min [2]

(iv) the number of people who took more than 50 minutes.

Answer(c)(iv) [2]

May/June 2015 (42)

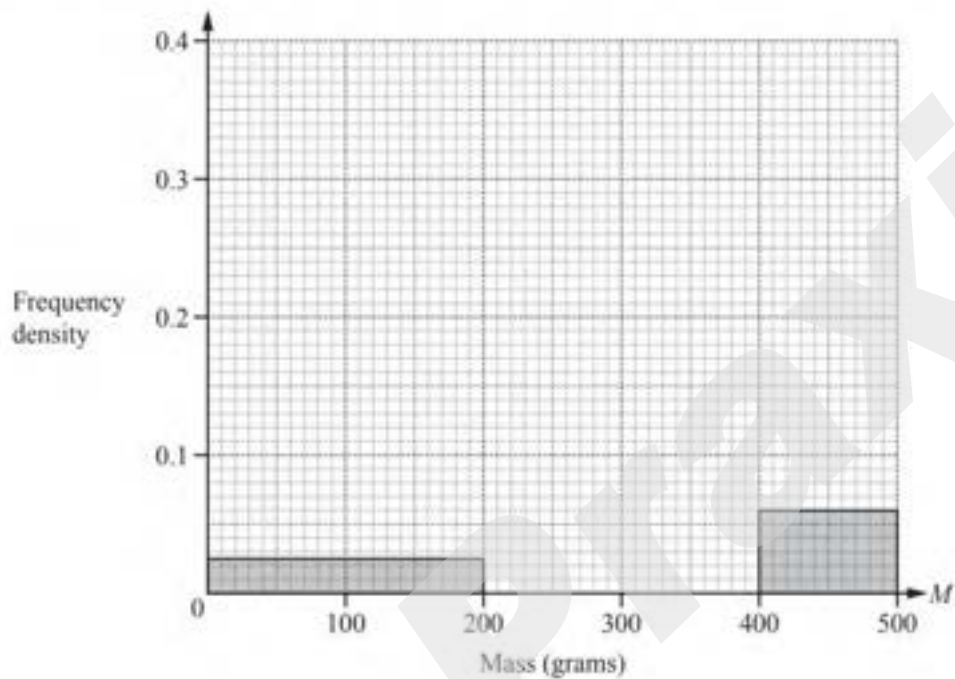
- 7 (a) A group of 50 students estimated the mass, M grams, of sweets in a jar. The results are shown in the table.

Mass (M grams)	Number of students
$0 < M \leq 200$	5
$200 < M \leq 300$	9
$300 < M \leq 350$	18
$350 < M \leq 400$	12
$400 < M \leq 500$	6

(i) Calculate an estimate of the mean.

Answer(a)(i) grams [4]

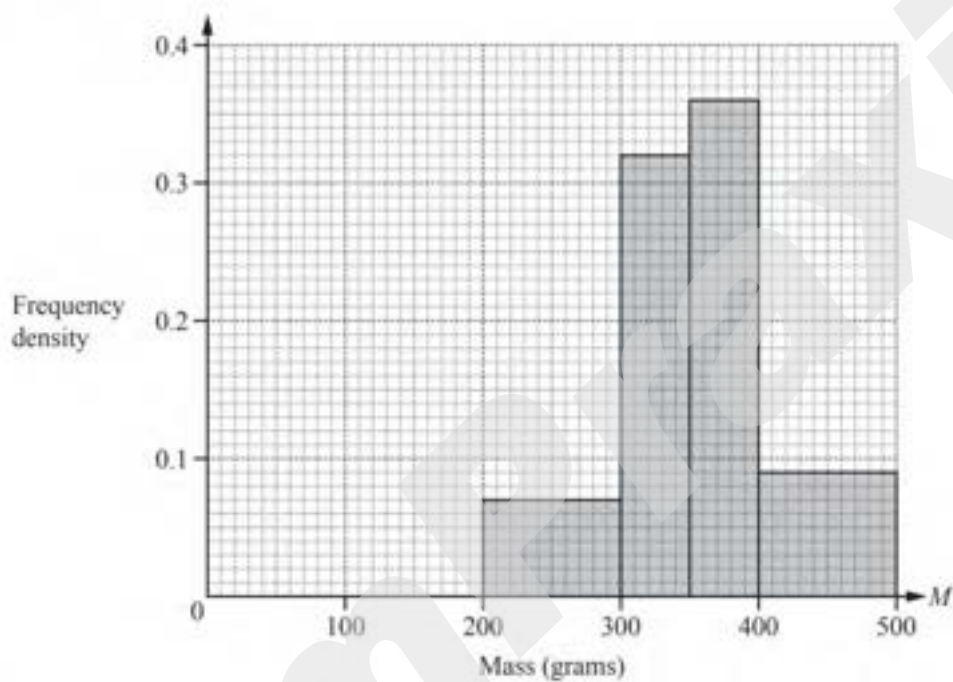
(ii) Complete this histogram to show the information in the table.



[3]

- (b) A group of 50 adults also estimated the mass, M grams, of the sweets in the jar. The histogram below shows information about their estimates.

Use the histograms to make two comparisons between the distributions of the estimates of the students and the adults.



Answer(b)

1

.....

2

..... [2]

May/June 2015 (43)

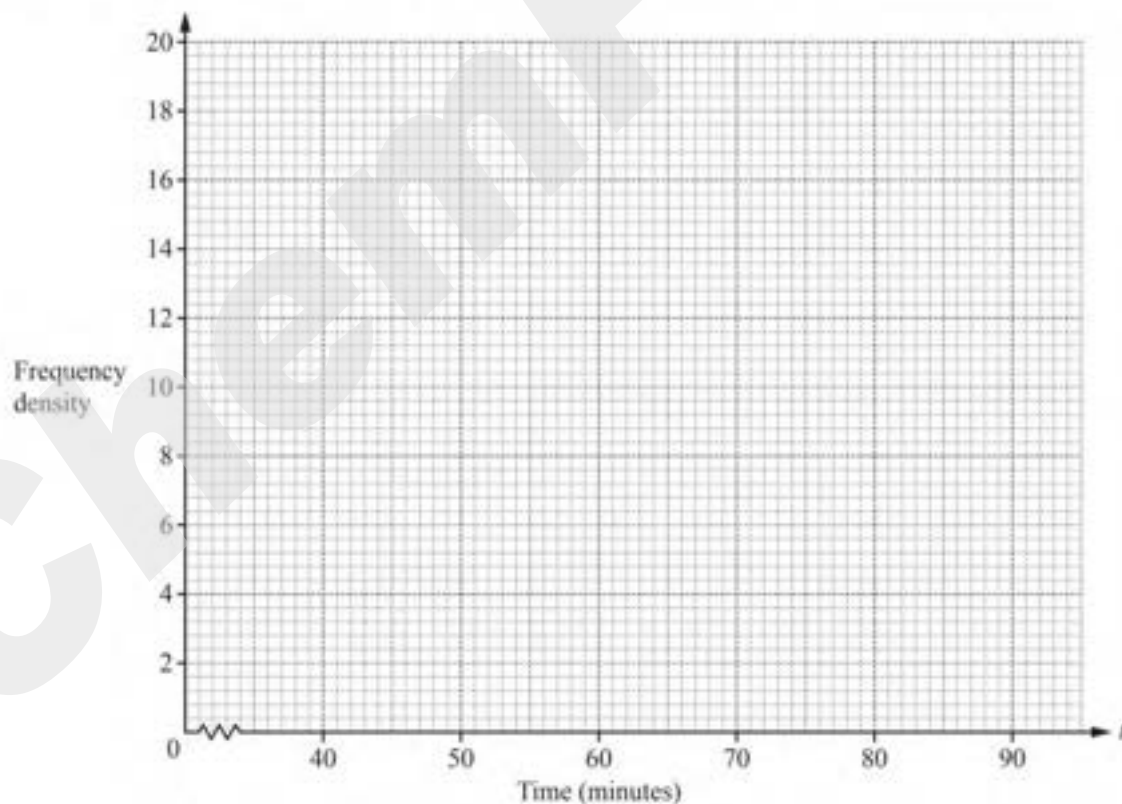
- 4 The table shows the times, t minutes, taken by 200 students to complete an IGCSE paper.

Time (t minutes)	$40 < t \leq 60$	$60 < t \leq 70$	$70 < t \leq 75$	$75 < t \leq 90$
Frequency	10	50	80	60

- (a) By using mid-interval values, calculate an estimate of the mean time.

Answer(a) min [3]

- (b) On the grid, draw a histogram to show the information in the table.



[4]

October/November 2015 (41)

6 120 students take a mathematics examination.

(a) The time taken, m minutes, for each student to answer question 1 is shown in this table.

Time (m minutes)	$0 < m \leq 1$	$1 < m \leq 2$	$2 < m \leq 3$	$3 < m \leq 4$	$4 < m \leq 5$	$5 < m \leq 6$
Frequency	72	21	9	11	5	2

Calculate an estimate of the mean time taken.

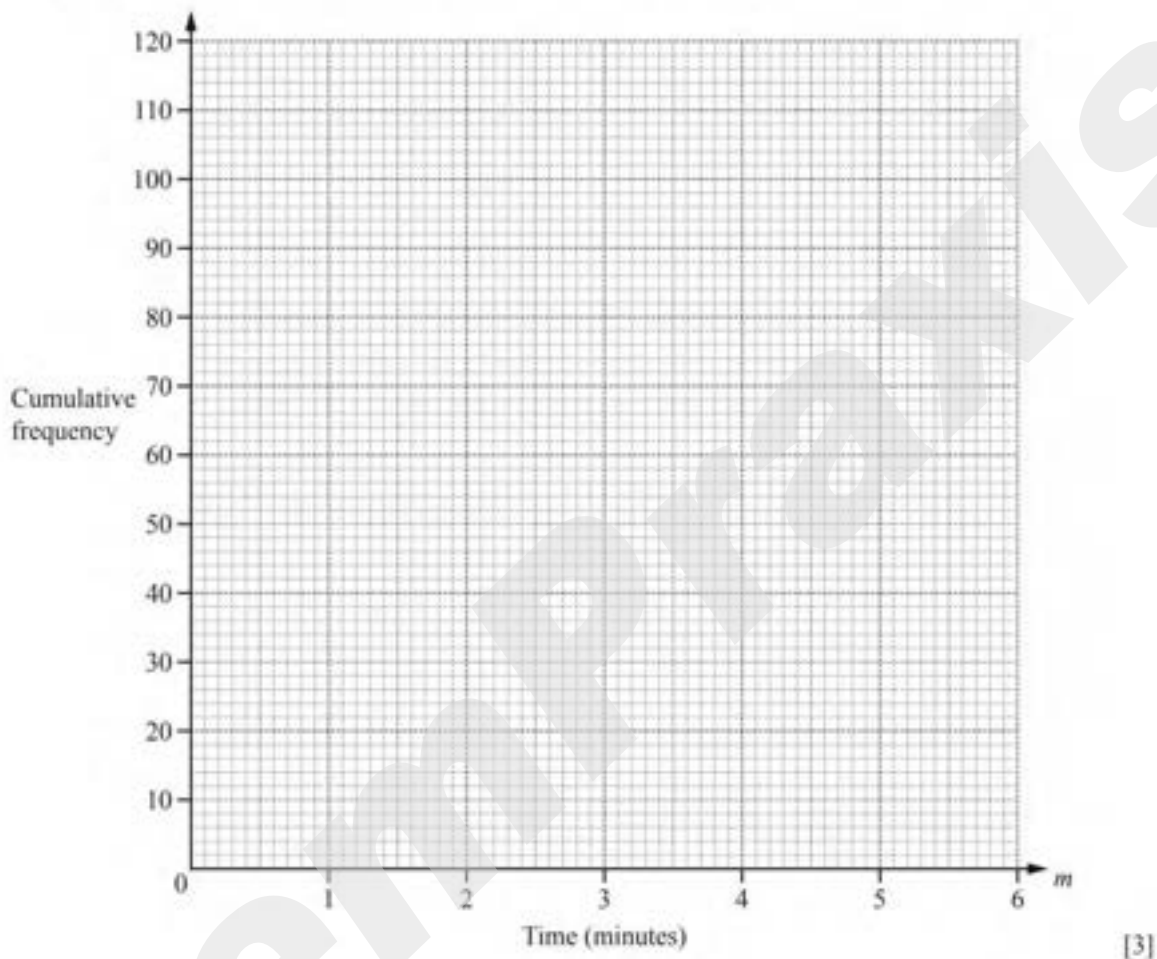
Answer(a) min [4]

(b) (i) Using the table in part (a), complete this cumulative frequency table.

Time (m minutes)	$m \leq 1$	$m \leq 2$	$m \leq 3$	$m \leq 4$	$m \leq 5$	$m \leq 6$
Cumulative frequency	72					120

[2]

(ii) Draw a cumulative frequency diagram to show the time taken.



(iii) Use your cumulative frequency diagram to find

(a) the median,

Answer(b)(iii)(a) min [1]

(b) the inter-quartile range,

Answer(b)(iii)(b) min [2]

(c) the 35th percentile.

Answer(b)(iii)(c) min [2]

(c) A new frequency table is made from the table shown in **part (a)**.

Time (m minutes)	$0 < m \leq 1$	$1 < m \leq 3$	$3 < m \leq 6$
Frequency	72		

- (i) Complete the table above. [2]
- (ii) A histogram was drawn and the height of the first block representing the time $0 < m \leq 1$ was 3.6 cm. Calculate the heights of the other two blocks.

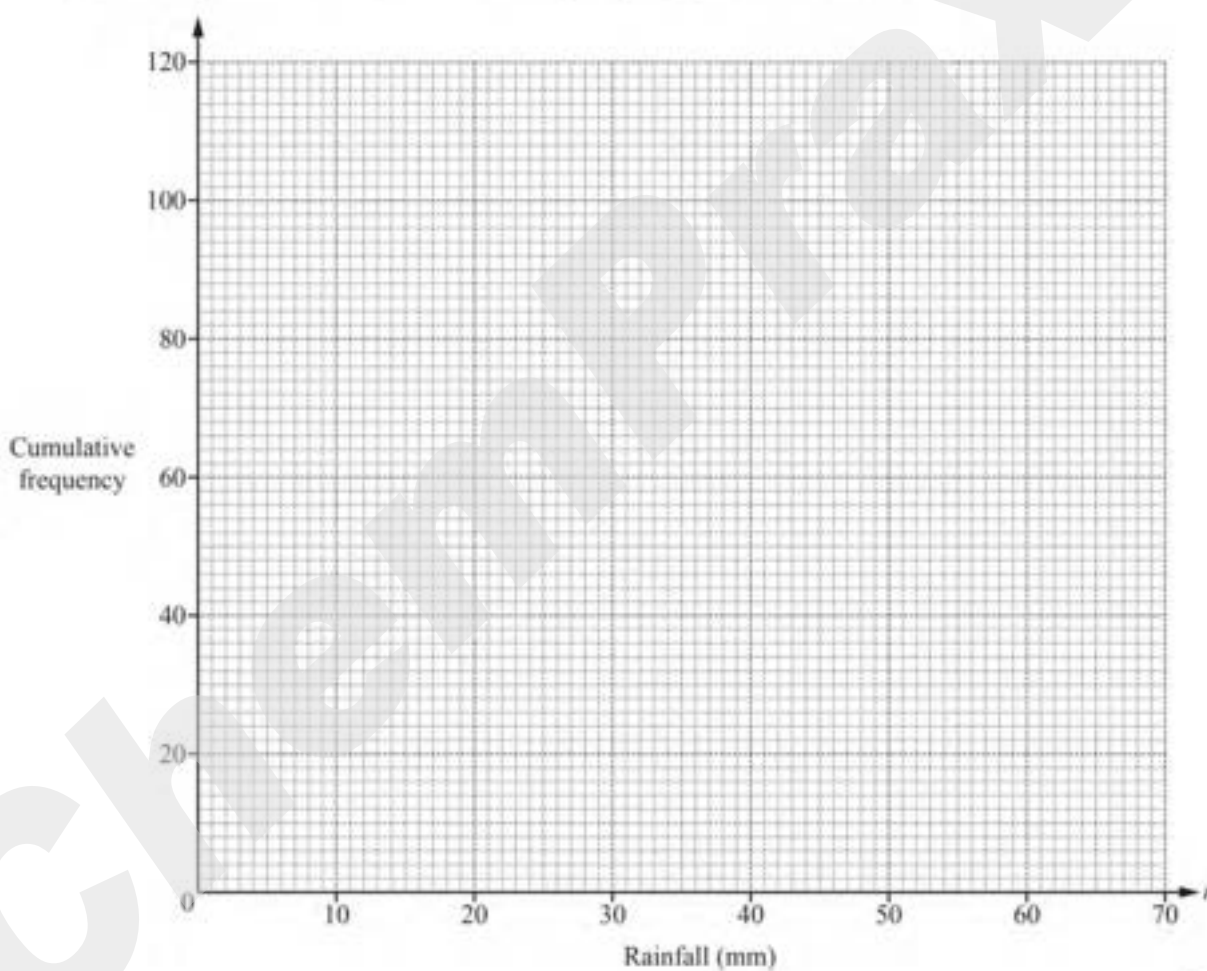
Answer(c)(ii) cm and cm [3]

October/November 2015 (42)

- 3 Leo measured the rainfall each day, in millimetres, for 120 days.
The cumulative frequency table shows the results.

Rainfall (r mm)	$r \leq 20$	$r \leq 25$	$r \leq 35$	$r \leq 40$	$r \leq 60$	$r \leq 70$
Cumulative frequency	5	13	72	90	117	120

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



[3]

- (b) (i) Find the median.

Answer(b)(i) mm [1]

- (ii) Use your diagram to find the number of days when the rainfall was more than 50 mm.

Answer(b)(ii) [2]

- (c) Use the information in the cumulative frequency table to complete the frequency table below.

Rainfall (r mm)	$0 < r \leq 20$	$20 < r \leq 25$	$25 < r \leq 35$	$35 < r \leq 40$	$40 < r \leq 60$	$60 < r \leq 70$
Frequency	5		59			3

[2]

- (d) Use your frequency table to calculate an estimate of the mean.
You must show all your working.

Answer(d) mm [4]

- (e) In a histogram drawn to show the information in the table in part (c), the frequency density for the interval $25 < r \leq 35$ is 5.9.

Calculate the frequency density for the intervals $20 < r \leq 25$, $40 < r \leq 60$ and $60 < r \leq 70$.

Answer(e) $20 < r \leq 25$

$40 < r \leq 60$

$60 < r \leq 70$ [4]

October/November 2015 (43)

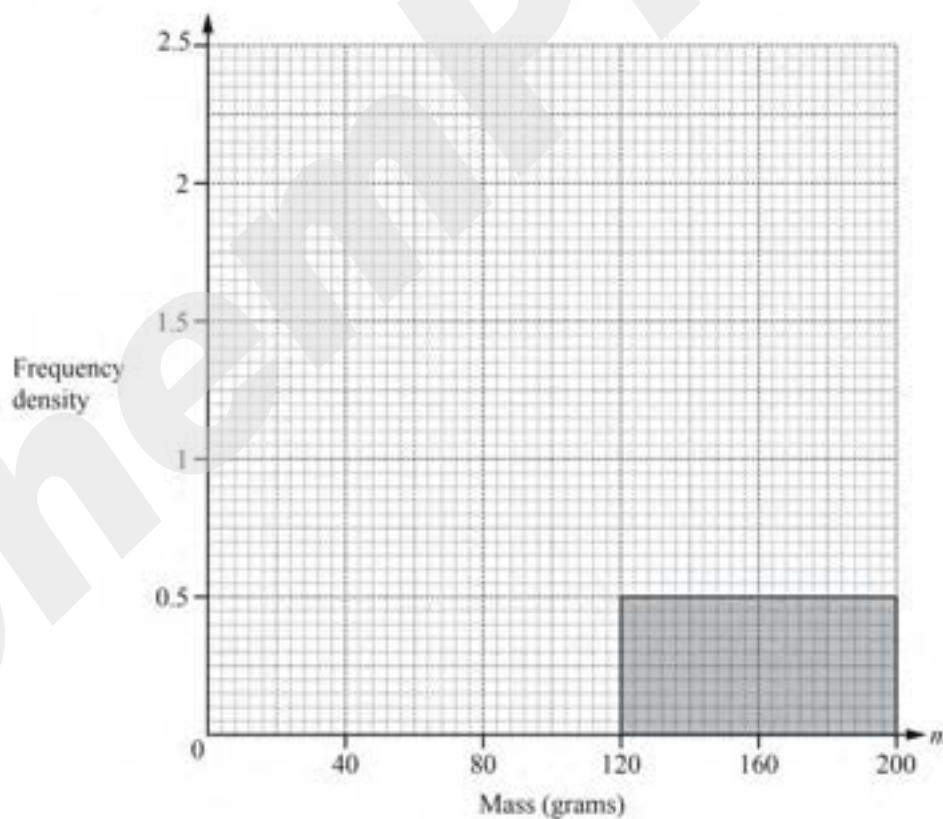
- 6 The table shows information about the masses, m grams, of 160 apples.

Mass (m grams)	$30 < m \leq 80$	$80 < m \leq 100$	$100 < m \leq 120$	$120 < m \leq 200$
Frequency	50	30	40	40

- (a) Calculate an estimate of the mean.

Answer(a) g [4]

- (b) On the grid, complete the histogram to show the information in the frequency table.



[3]

(c) An apple is chosen at random from the 160 apples.

Find the probability that its mass is more than 120 g.

Answer(c) [1]

(d) Two apples are chosen at random from the 160 apples, without replacement.

Find the probability that

(i) they both have a mass of more than 120 g.

Answer(d)(i) [2]

(ii) one has a mass of more than 120 g and one has a mass of 80 g or less.

Answer(d)(ii) [3]