Chapter 11

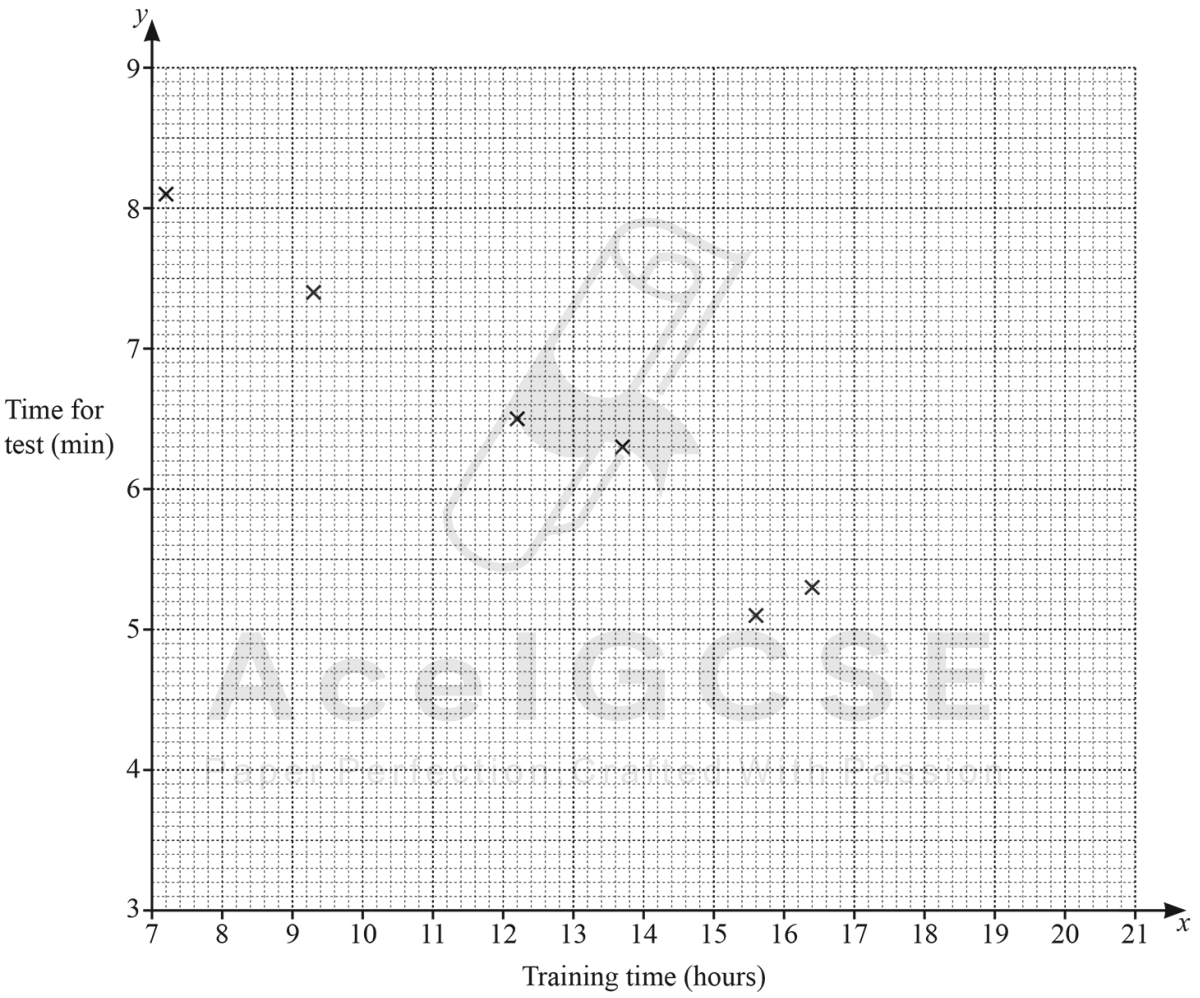
Statistics

01. 0607_m24_qp_42 Q: 4

Ten people trained for a fitness test.
The table shows the amount of time they each trained and the time they each took to do the test.

Training time (x hours)	12.2	9.3	16.4	7.2	15.6	13.7	9.4	13.1	12.8	14.2
Time for test (y minutes)	6.5	7.4	5.3	8.1	5.1	6.3	7.6	6.6	6.9	5.7

(a) Complete the scatter diagram.
The first 6 points have been plotted for you.



[2]

(b) What type of correlation is shown on the scatter diagram?

..... [1]

(c) Find the equation of the regression line.
Give your answer in the form $y = mx + c$.

$y =$ ..... [2]

(d) Anna trained for 10.8 hours.

Use your equation to estimate the time Anna took for the test.

..... min [1]

(e) Ben trained for 20.5 hours.

Explain why you should not use your equation to estimate the time Ben took for the test.

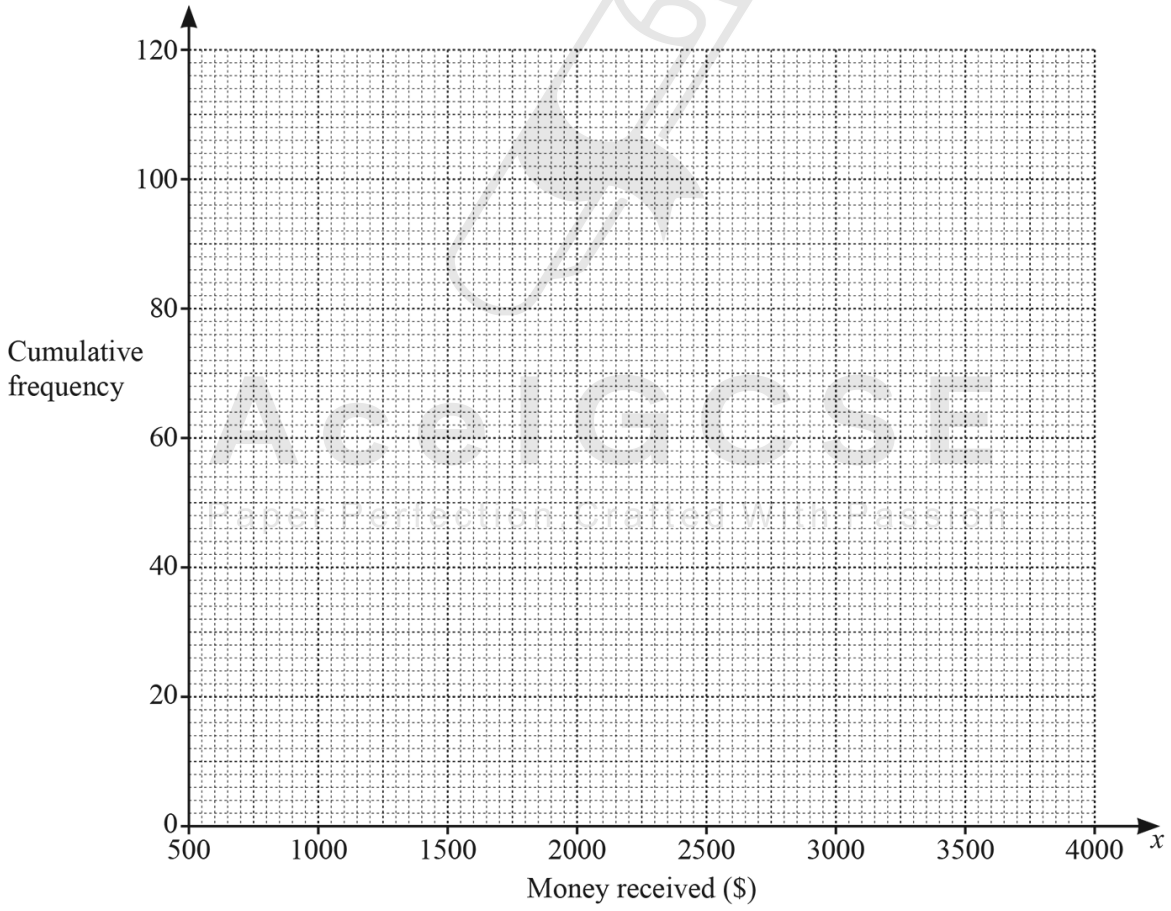
..... [1]

02. 0607_m24_qp_42 Q: 8

The table shows the money received in a shop for 120 days.

Money received ($\$x$)	Frequency
$500 < x \leqslant 1000$	6
$1000 < x \leqslant 1500$	16
$1500 < x \leqslant 2000$	24
$2000 < x \leqslant 2500$	36
$2500 < x \leqslant 3000$	20
$3000 < x \leqslant 3500$	14
$3500 < x \leqslant 4000$	4

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



[4]

(b) Use your curve to estimate

(i) the median

$ ..... [1]

(ii) the interquartile range.

$ ..... [2]

(c) Use your curve to estimate the percentage of these 120 days where the shop received more than $1800.

..... % [3]

03. 0607_s24_qp_41 Q: 2

(a) The heights, x cm, of 100 plants are shown in the table.

Height (x cm)	$0 < x \leqslant 20$	$20 < x \leqslant 35$	$35 < x \leqslant 40$	$40 < x \leqslant 60$	$60 < x \leqslant 80$
Frequency	7	13	20	32	28

(i) Calculate an estimate of the mean height of the plants.

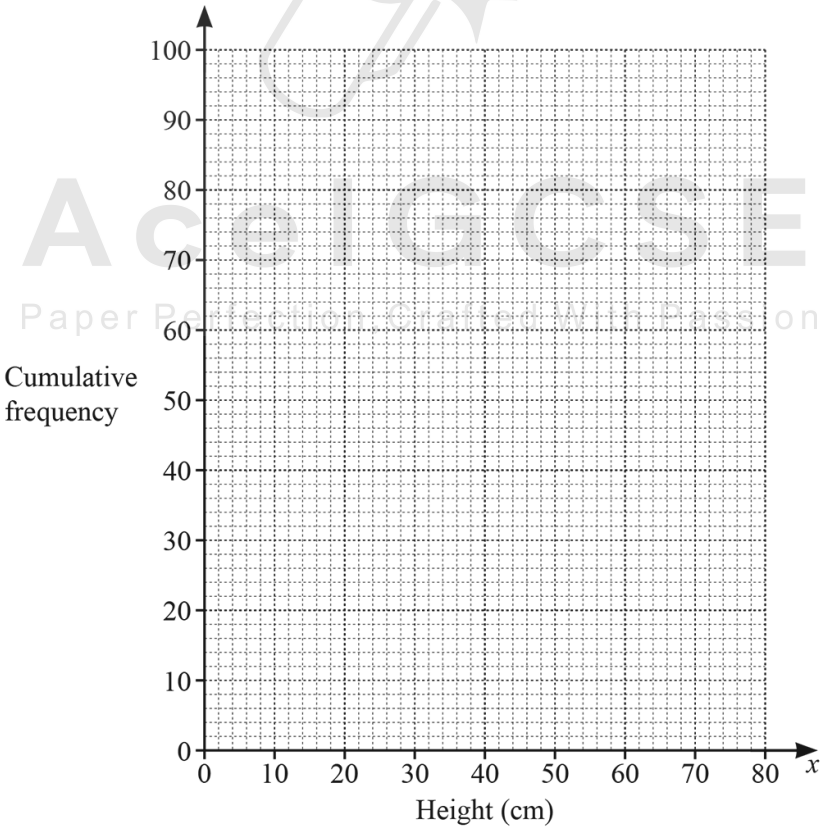
..... cm [2]

(ii) **(a)** Complete the cumulative frequency table for the plants.

Height (x cm)	$x \leqslant 20$	$x \leqslant 35$	$x \leqslant 40$	$x \leqslant 60$	$x \leqslant 80$
Cumulative frequency	7				100

[1]

(b) On the grid, draw the cumulative frequency curve.



[3]

(c) Use your cumulative frequency curve to find an estimate for the interquartile range.

..... cm [2]

(b) The heights, h cm, of 50 different plants are shown in the table, where k is an integer.

Height (h cm)	Frequency
$0 < h \leqslant 20$	25
$20 < h \leqslant k$	15
$k < h \leqslant 80$	10

An estimate of the mean height of these plants is 27 cm.

Find the value of k.

$k =$ ..... [3]

04. 0607_s24_qp_42 Q: 4

(a) Erin rolls a biased die a number of times.
The table shows the results.

Score	1	2	3	4	5	6
Frequency	6	6	3	6	x	4

The mean score is 3.75 .

Find the value of x.

$x =$ ..... [3]

(b) 70 students each record the time taken to complete their mathematics homework.
The table shows the results.

Time, t minutes	$0 < t \leqslant 5$	$5 < t \leqslant 10$	$10 < t \leqslant 15$	$15 < t \leqslant 25$	$25 < t \leqslant 50$
Frequency	7	21	23	16	3

(i) Calculate an estimate of the mean.

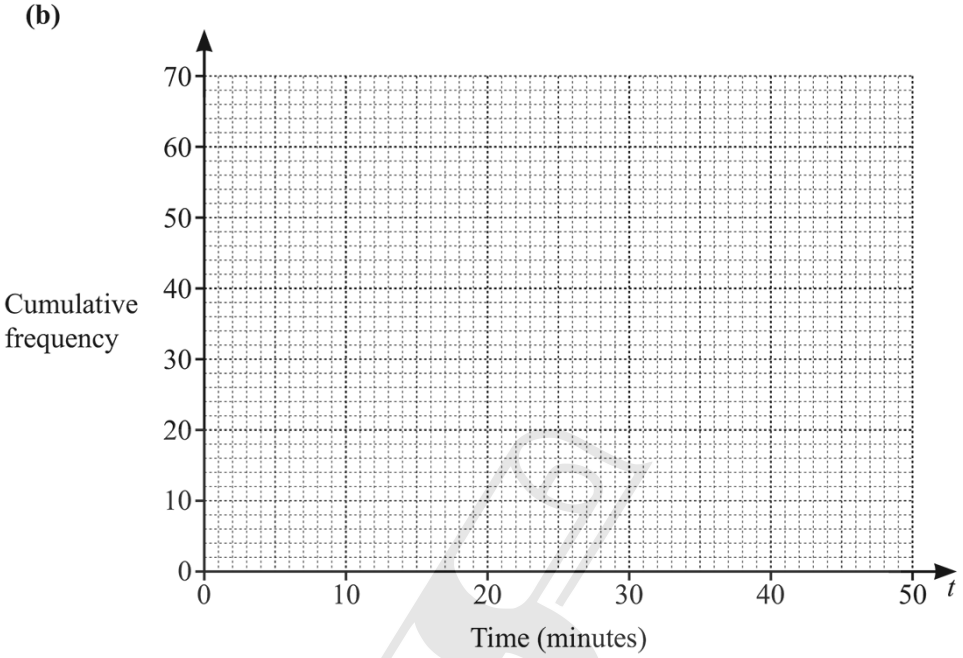
..... min [2]

(ii) **(a)** Use the information in the table to complete the cumulative frequency table.

Time, t minutes	$t \leqslant 5$	$t \leqslant 10$	$t \leqslant 15$	$t \leqslant 25$	$t \leqslant 50$
Cumulative frequency					

[2]

(b)



On the grid, draw the cumulative frequency curve. [3]

(c) Use your curve to estimate the median.

..... min [1]

(d) Use your curve to estimate the number of students who took more than 13 minutes to complete their mathematics homework.

..... [2]

05. 0607_s24_qp_43 Q: 1

(a) There are 120 houses in a street.
The table shows the numbers of letters delivered to the houses one day.

Number of letters	0	1	2	3	4	5	6
Frequency	26	20	23	25	14	8	4

Find

(i) the mode

..... [1]

(ii) the median

..... [1]

(iii) the range

..... [1]

(iv) the upper quartile

..... [1]

(v) the mean.

..... [2]

(b) This table shows the numbers of letters delivered to the houses in another street one day.

Number of letters	0	1	2	3	4	5	6
Frequency	18	31	27	18	n	12	5

The mean number of letters delivered in this street is 2.28 .

Find the value of n.

$n =$ ..... [3]

06. 0607_m23_qp_42 Q: 1

The table shows the marks scored by each of 75 students in a test.

Mark	0	1	2	3	4	5	6	7	8	9	10
Number of students	1	4	5	6	9	10	11	7	6	13	3

(a) Write down the mode.

..... [1]

(b) Write down the range.

..... [1]

(c) Find the median.

..... [1]

(d) Find the lower quartile.

..... [1]

(e) Calculate the mean.

..... [2]

07. 0607_m23_qp_42 Q: 4

The heights, x cm, of 500 students in a school are shown in the table.

Height (x)	Frequency
$150 < x \leqslant 155$	24
$155 < x \leqslant 160$	42
$160 < x \leqslant 165$	84
$165 < x \leqslant 170$	106
$170 < x \leqslant 175$	112
$175 < x \leqslant 180$	87
$180 < x \leqslant 185$	45

(a) Calculate an estimate of the mean height.

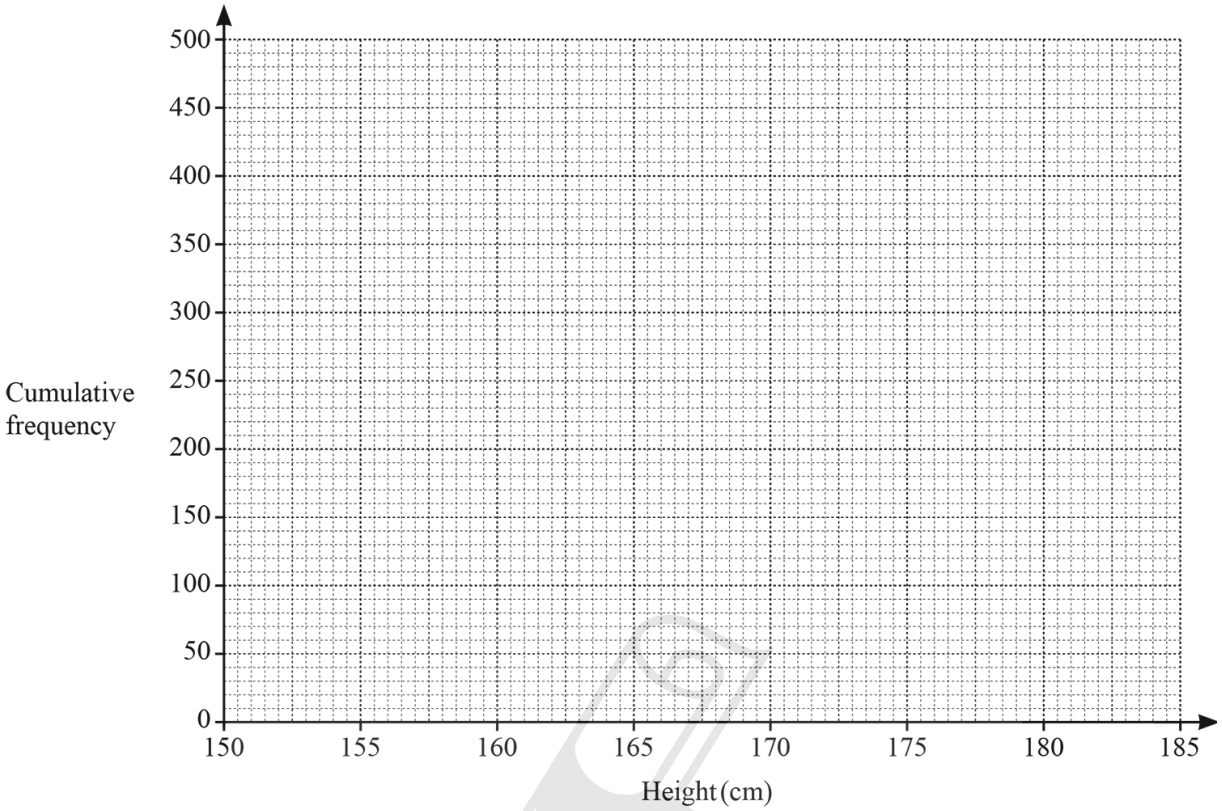
..... cm [2]

(b) Complete the cumulative frequency table.

Height (x)	Cumulative frequency
$x \leqslant 155$	24
$x \leqslant 160$	
$x \leqslant 165$	
$x \leqslant 170$	
$x \leqslant 175$	
$x \leqslant 180$	
$x \leqslant 185$	500

[1]

(c) On the grid below, draw a cumulative frequency curve.



[3]

(d) Use your graph in **part (c)** to find an estimate for

(i) the upper quartile

..... cm [1]

(ii) the percentage of students who are less than 162 cm in height.

..... % [2]

08. 0607_s23_qp_41 Q: 1

25 students each record the number of logic problems they solve in one hour.
The table shows the results.

Number of logic problems solved	3	4	5	6	7	8
Frequency	1	3	8	7	5	1

(a) Find

(i) the range

..... [1]

(ii) the mode

..... [1]

(iii) the median

..... [1]

(iv) the interquartile range

..... [2]

(v) the mean.

..... [2]

(b) Nabile draws a pie chart.

Calculate the angle that represents 7 logic problems solved.

..... [2]

(c) Shabana draws a bar chart using these results.
The bar that represents 4 logic problems solved has a height of 4.5 cm.

Calculate the height of the bar that represents 5 logic problems solved.

..... cm [2]

09. 0607_s23_qp_43 Q: 3

The table shows the marks of 12 students in a French examination and a Spanish examination.

French mark (x)	17	23	28	32	37	42	57	61	77	82	94	96
Spanish mark (y)	26	22	33	46	41	53	62	67	66	75	83	95

(a) Find the **median** Spanish mark.

..... [1]

(b) Find the mean French mark.

..... [1]

(c) Find the equation of the regression line for y in terms of x.

$y =$ ..... [2]

(d) Use your equation to estimate the Spanish mark when

(i) the French mark is 50

..... [1]

(ii) the French mark is 6.

..... [1]

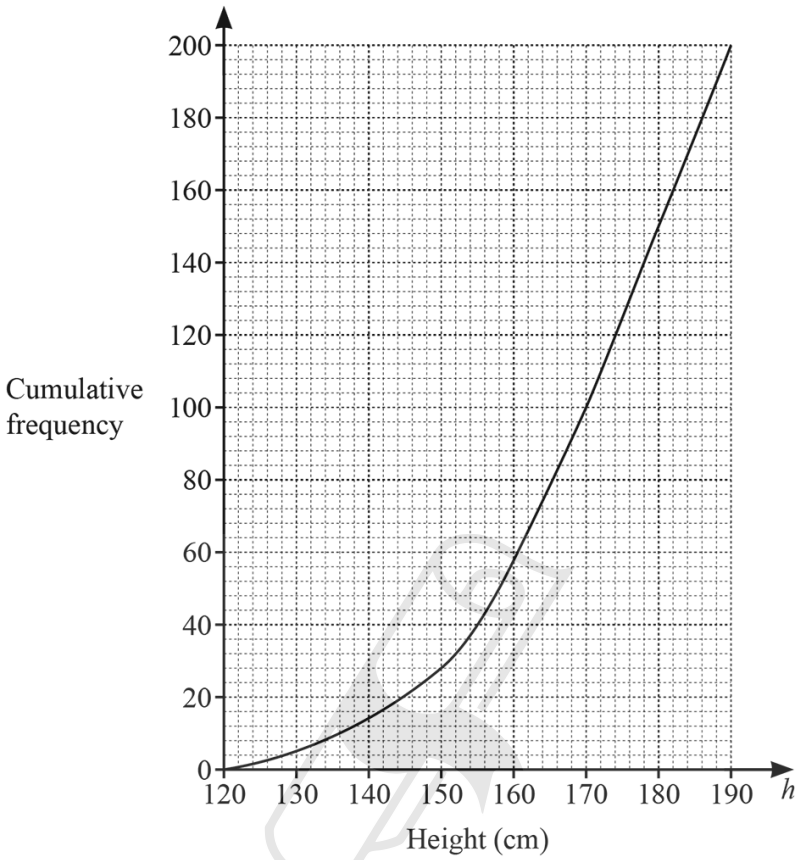
(e) Which French mark, 50 or 6, is likely to give the most reliable Spanish mark?
Give a reason for your answer.

..... because .....

..... [1]

10. 0607_w23_qp_41 Q: 3

Each of 200 students records their height, h cm.
The results are shown on the cumulative frequency curve.



(a) Use the cumulative frequency curve to find

(i) the median

..... cm [1]

(ii) the interquartile range

..... cm [2]

(iii) the number of students with a height greater than 150 cm.

..... [2]

(b) Use the cumulative frequency curve to complete the frequency table.

Height (h cm)	$120 < h \leqslant 150$	$150 < h \leqslant 170$	$170 < h \leqslant 180$	$180 < h \leqslant 190$
Frequency				

[2]

(c) Use the frequency table to calculate an estimate of the mean height.

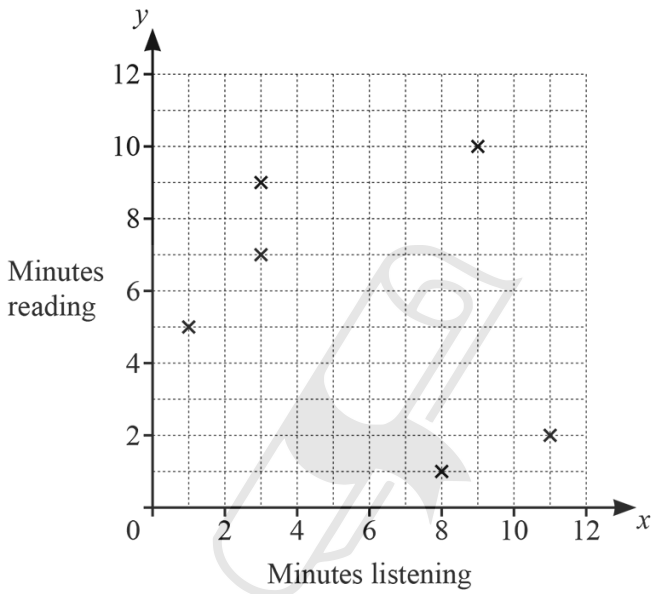
..... cm [2]

11. 0607_w23_qp_42 Q: 4

(a) A group of 10 people were asked the time, correct to the nearest minute, they each spent listening to the news and reading the news on Monday.
The results are shown in the table.

Minutes listening (x)	1	9	3	3	11	8	2	7	1	4
Minutes reading (y)	5	10	9	7	2	1	3	6	11	5

(i) Complete the scatter diagram.
The first six points have been plotted for you.



[2]

(ii) Find the median time spent reading the news on Monday.

..... min [1]

(iii) Find the equation of the line of regression.
Give your answer in the form $y = mx + c$.

$y =$ ..... [2]

(iv) On Tuesday, each person spends the same time listening to the news as they did on Monday.
They each spend 5 minutes longer reading the news than they did on Monday.

Write down the equation of the line of regression for Tuesday.

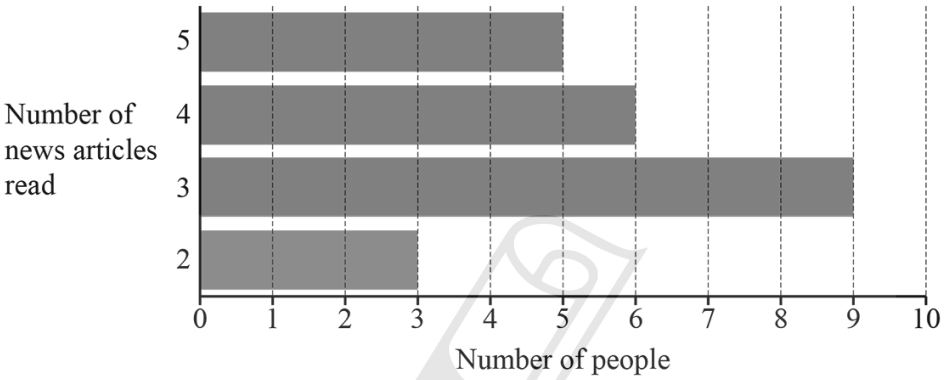
$y =$ ..... [1]

(b) In February Sancho read the news for a total of 8 hours.
This was a reduction of 36% from January.

Work out how long Sancho read the news in January.

..... hours [2]

(c) The bar chart shows the number of news articles read one day by each of 23 people.



Calculate the mean number of articles read.

..... [2]

12. 0607_w23_qp_43 Q: 2

These are Sunni's last 12 scores in a game.

7	17	4	20	15	12	11	16	6	18	9	20

(a) Find

(i) the mode

.... [1]

(ii) the median

.... [1]

(iii) the mean

.... [1]

(iv) the range

.... [1]

(v) the upper quartile.

.... [1]

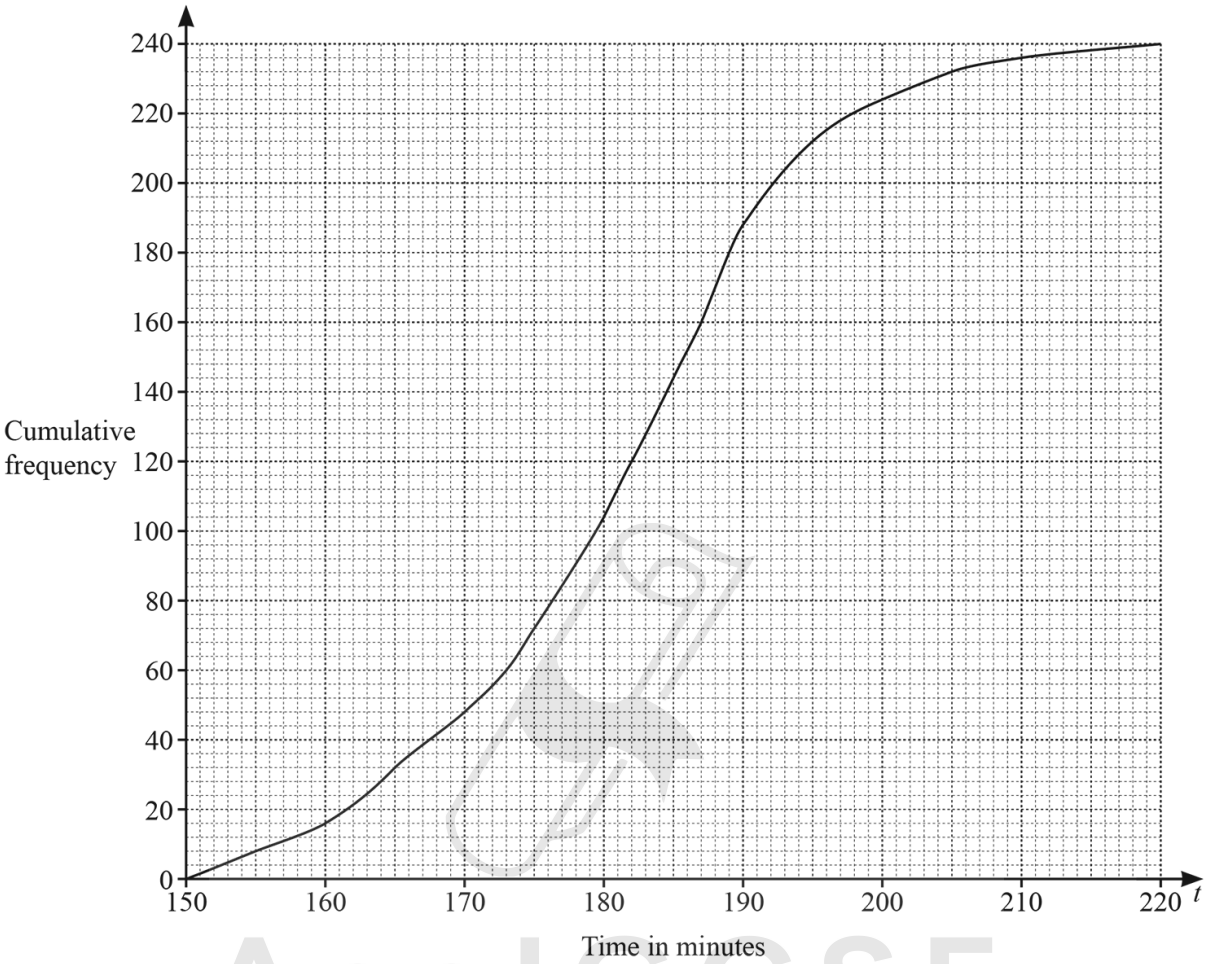
(b) Explain why the mode is not the best measure of average to represent Sunni's scores.

....

.... [1]

13. 0607_w23_qp_43 Q: 7

240 people take part in a marathon race.
The times, t minutes, they took for the race are shown in the cumulative frequency curve.



(a) Use the curve to estimate

(i) the median time

..... min [1]

(ii) the interquartile range.

..... min [2]

(b) The fastest 20% of the runners are awarded a medal.

Use the curve to estimate the longest time taken by a runner who received a medal.

..... min [2]

(c) Use the curve to complete the frequency table.

Time, t minutes	$150 < t \leqslant 160$	$160 < t \leqslant 170$	$170 < t \leqslant 180$	$180 < t \leqslant 190$	$190 < t \leqslant 200$	$200 < t \leqslant 210$	$210 < t \leqslant 220$
Frequency	16	32					

[2]

(d) Use the table in **part (c)** to calculate an estimate of the mean time.

..... min [2]

14. 0607_s19_qp_41 Q: 5

Jian asks 60 people what their favourite type of television programme is.

These are the results.

Type of programme	Number of people
Factual	15
Sport	18
Drama	12
Game Show	10
Other	5

(a) Jian draws a pie chart to show these results.

Calculate the sector angle for Drama.

..... [2]

(b) Jian chooses one of the 60 people at random.

Write down the probability that the person says Factual.

..... [1]

(c) Jian chooses two of the 60 people at random.

(i) Find the probability that one of them says Drama and the other says Game Show.

..... [3]

(ii) Find the probability that at least one person says Sport.

..... [3]

15. 0607_m22_qp_42 Q: 3

(a) The table shows the coursework grades for 20 students.

Grade	3	4	5	6	7
Frequency	1	3	6	2	8

Find

(i) the mode,

..... [1]

(ii) the range,

..... [1]

(iii) the median,

..... [1]

(iv) the lower quartile.

..... [1]

(b) The table shows some information about the heights, h cm, of 100 bushes.

Height (h cm)	$100 < h \leqslant 110$	$110 < h \leqslant 115$	$115 < h \leqslant 130$
Frequency	18	37	45

Calculate an estimate of the mean height.

..... cm [2]

(c) The table shows some information about the times, t minutes, taken by some students to read a magazine.

Time (t minutes)	$0 < t \leqslant 10$	$10 < t \leqslant 20$	$20 < t \leqslant 30$	$30 < t \leqslant 40$
Frequency	3	11	n	19

When using mid-interval values, an estimate of the mean value of t is 25.4 .

Find the value of n.

$n =$ ..... [4]

16. 0607_s21_qp_42 Q: 3
The table shows the masses of 30 sheep.

Mass, m kg	$60 < m \leqslant 80$	$80 < m \leqslant 100$	$100 < m \leqslant 120$	$120 < m \leqslant 140$
Frequency	8	3	12	7

(a) Write down the modal group.

..... [1]

(b) Write down the class which contains the lower quartile.

..... [1]

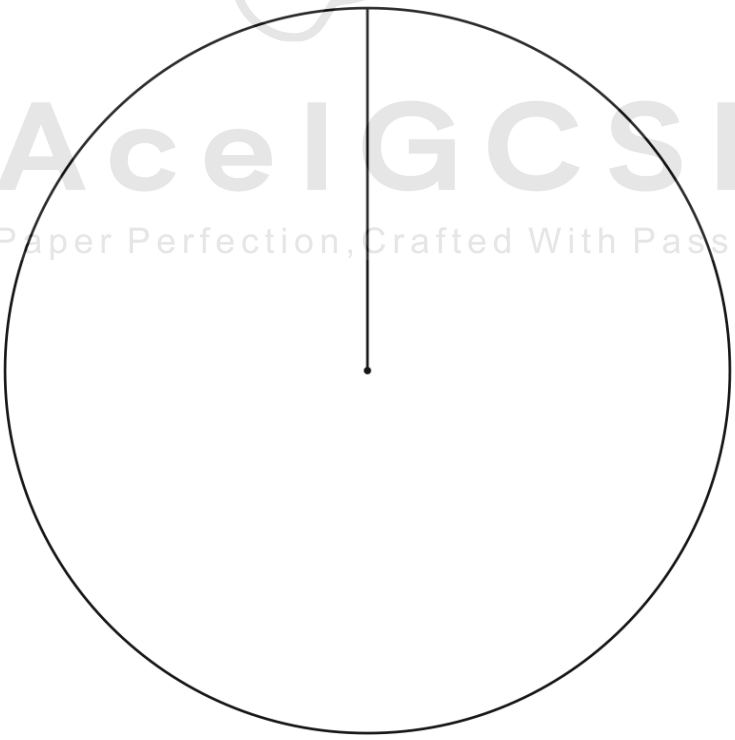
(c) Maria says that the range of masses is 80 kg.

Explain why she is incorrect.

.....

..... [1]

(d) Draw an accurate pie chart to show this information.



[4]

17. 0607_s21_qp_43 Q: 5

(a) There are 200 students in a school.
The table shows information about their heights, h cm.

Height, h cm	$150 < h \leqslant 165$	$165 < h \leqslant 170$	$170 < h \leqslant 175$	$175 < h \leqslant 180$	$180 < h \leqslant 190$	$190 < h \leqslant 20$
Frequency	7	17	43	64	49	20

Calculate an estimate of the mean height.

..... cm [2]

(b) A biased die in the shape of a cube is numbered 0, 1, 1, 2, 3 and 3.
It is rolled 100 times.
The table shows the results.

Score	0	1	2	3
Frequency	x	y	30	45

The mean score is 2.13 .

Find the value of x and the value of y.

$x =$ .....

$y =$ ..... [3]

18. 0607_w21_qp_41 Q: 4

The table shows a set of data.

x	Frequency
5	16
6	18
7	25
8	11
9	6
10	4
Total	80

(a) When x represents the number of emails Essa receives each day, find

(i) the median,

..... [1]

(ii) the range,

..... [1]

(iii) the upper quartile,

..... [1]

(iv) the mean.

..... [2]

(b) When x represents the height of a seedling, correct to the nearest centimetre, explain why you cannot work out the range of the heights.

.....

..... [1]

19. 0607_s20_qp_41 Q: 2

(a) These are Tom's ten homework marks.

8 7 10 8 9 5 8 10 6 8

Find

(i) the range,

..... [1]

(ii) the mean,

..... [1]

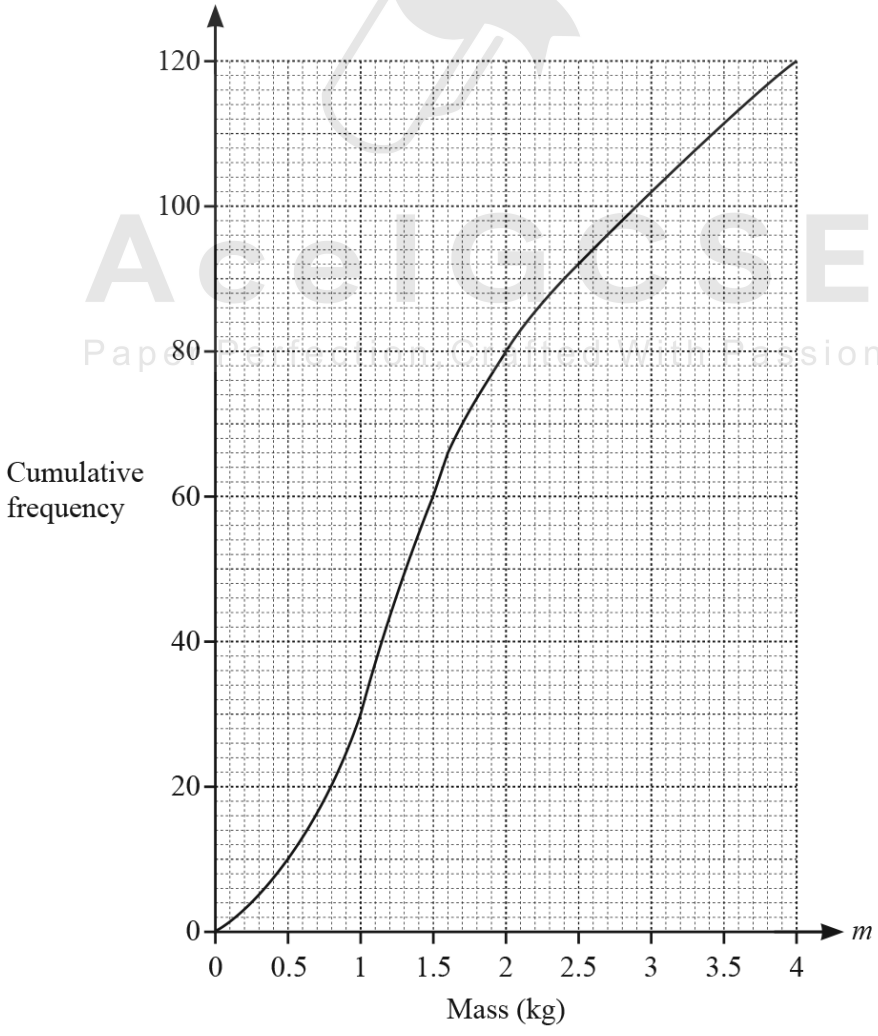
(iii) the median,

..... [1]

(iv) the upper quartile.

..... [1]

(b) The mass, m kg, of each of 120 parcels is recorded.
The cumulative frequency curve shows the results.



(i) Find the median.

..... kg [1]

(ii) Find the lower quartile.

..... kg [1]

(iii) Find the interquartile range.

..... kg [1]

(iv) Find the number of parcels with a mass of more than 3 kg.

..... [2]

(v) **(a)** Use the cumulative frequency curve to complete the frequency table.

Mass (m kg)	$0 < m \leqslant 1$	$1 < m \leqslant 1.5$	$1.5 < m \leqslant 2$	$2 < m \leqslant 3$	$3 < m \leqslant 4$
Frequency	30	30			

[3]

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

..... kg [2]

20. 0607_s20_qp_43 Q: 8

The number of people living in each house in a street of 100 houses is recorded.
The results are shown in the table.

Number of people	Frequency
1	5
2	16
3	28
4	32
5	17
6	2

(a) Find

(i) the range,

..... [1]

(ii) the median,

..... [1]

(iii) the mean.

..... [2]

(b) Two of the houses are selected at random.

Find the probability that

(i) both had exactly one person living in them,

..... [2]

(ii) one had exactly 2 people living in it and the other had exactly 3 people living in it,

..... [3]

(iii) at least one house had fewer than 5 people living in it.

..... [2]

---

21. 0607_s19_qp_42 Q: 9

240 students take part in a charity run.
The table shows information about the times, t minutes, taken to complete the run.

Time (t minutes)	$20 < t \leqslant 40$	$40 < t \leqslant 50$	$50 < t \leqslant 55$	$55 < t \leqslant 75$
Number of students	20	70	120	30

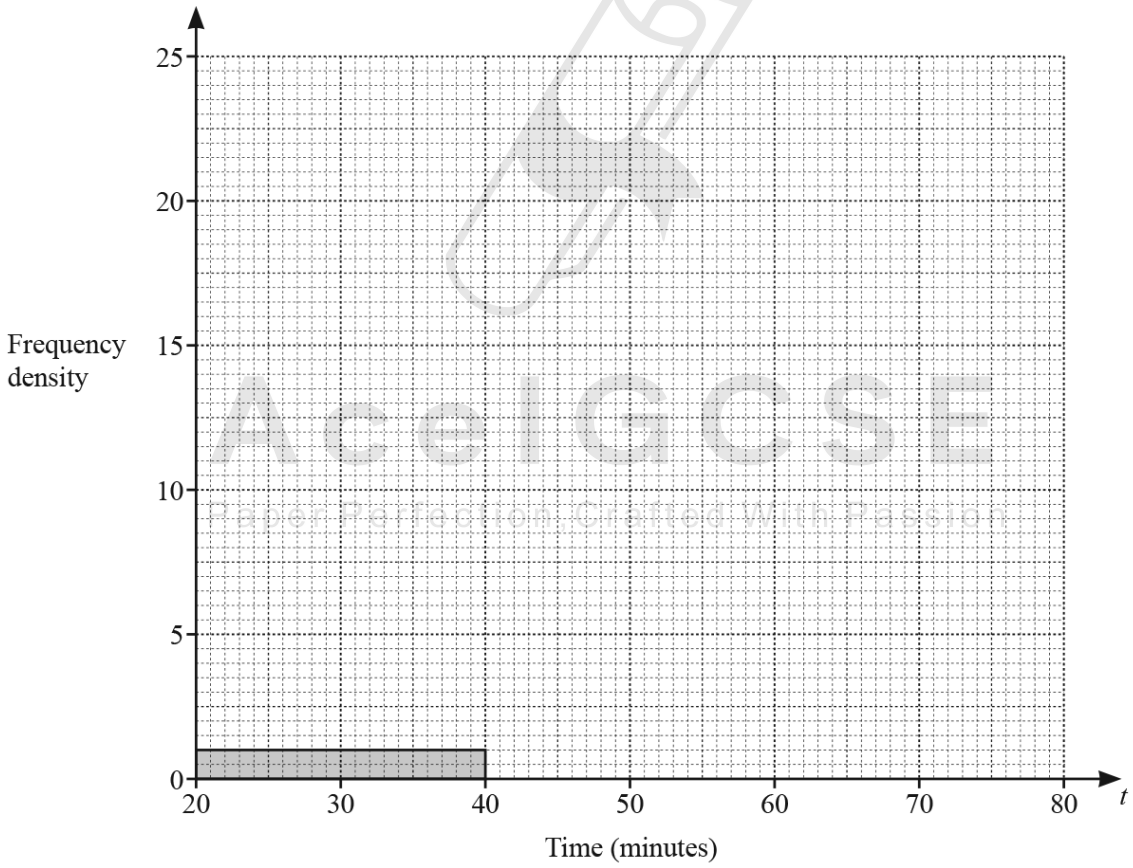
(a) Write down the time interval that contains the median.

..... $< t \leqslant$ ..... [1]

(b) Calculate an estimate of the mean.

.....min [2]

(c) Complete the histogram to show the information in the table.



[4]

(d) (i) One of the 240 students is chosen at random.

Find the probability that this student took more than 55 minutes to complete the run.

..... [1]

(ii) Two students are chosen at random from the 240 students.

Calculate the probability that they both took more than 50 minutes.

..... [2]

(iii) Two students are chosen at random from the 240 students.

Complete the statement.

The probability that they both had times in the interval ..... $< t \leqslant$ ..... is $\frac{161}{1912}$.

[2]

22. 0607_s18_qp_42 Q: 4

(a) The mass, x grams, of each of 100 oranges is found.
The results are shown in the table.

Mass (x grams)	Frequency
$0 < x \leqslant 100$	4
$100 < x \leqslant 140$	14
$140 < x \leqslant 180$	22
$180 < x \leqslant 250$	35
$250 < x \leqslant 300$	25

(i) Calculate an estimate of the mean mass of the oranges.

..... g [2]

(ii) Two of these oranges are chosen at random.

Calculate the probability that they both have a mass of 140 g or less.

..... [2]

(iii) The oranges with a mass of 140 g or less are removed.
From the remaining oranges, two are chosen at random.

Calculate the probability that one orange has a mass of 250 g or less and the other has a mass of more than 250 g.

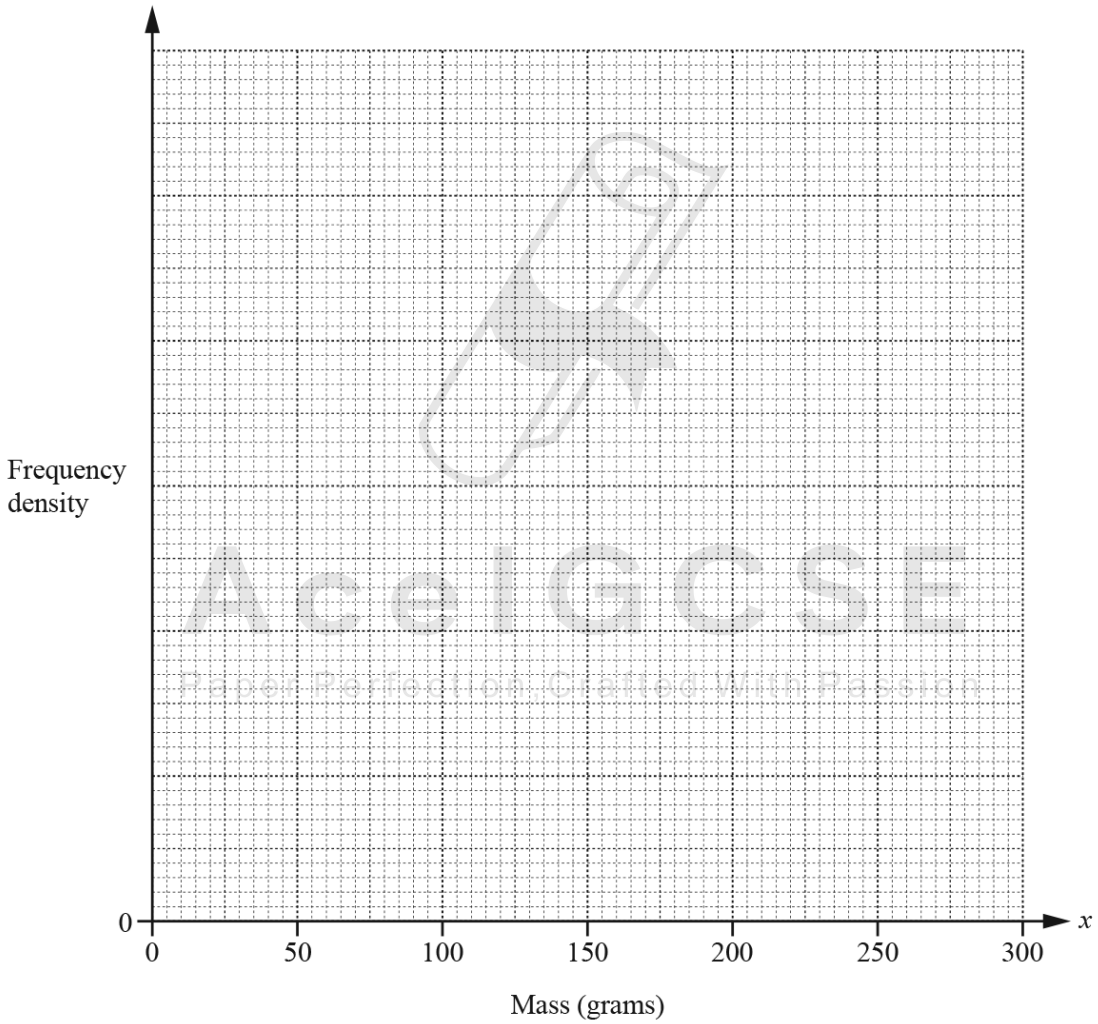
..... [3]

(b) **(i)** Complete the frequency density column in this table.

Mass (x grams)	Frequency	Frequency density
$0 < x \leqslant 100$	4	
$100 < x \leqslant 140$	14	
$140 < x \leqslant 180$	22	
$180 < x \leqslant 250$	35	
$250 < x \leqslant 300$	25	

[2]

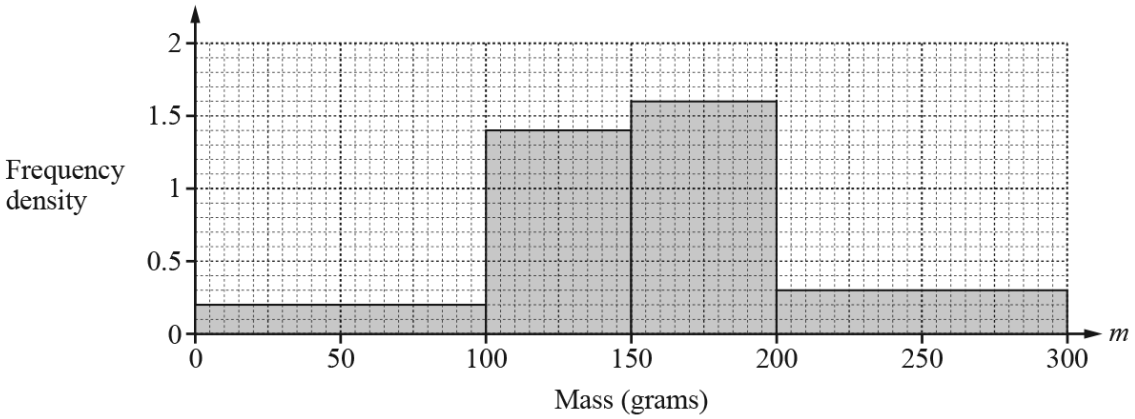
(ii) On the grid, draw a histogram to show this information.



[4]

23. 0607_w18_qp_43 Q: 11

The mass, m grams, of each of 200 potatoes is measured.
The histogram shows the results.



(a) Complete the frequency table.

Mass (m grams)	$0 < m \leqslant 100$	$100 < m \leqslant 150$	$150 < m \leqslant 200$	$200 < m \leqslant 300$
Frequency	20			

[2]

(b) Calculate an estimate of the mean.

..... g [2]

24. 0607_s17_qp_42 Q: 11

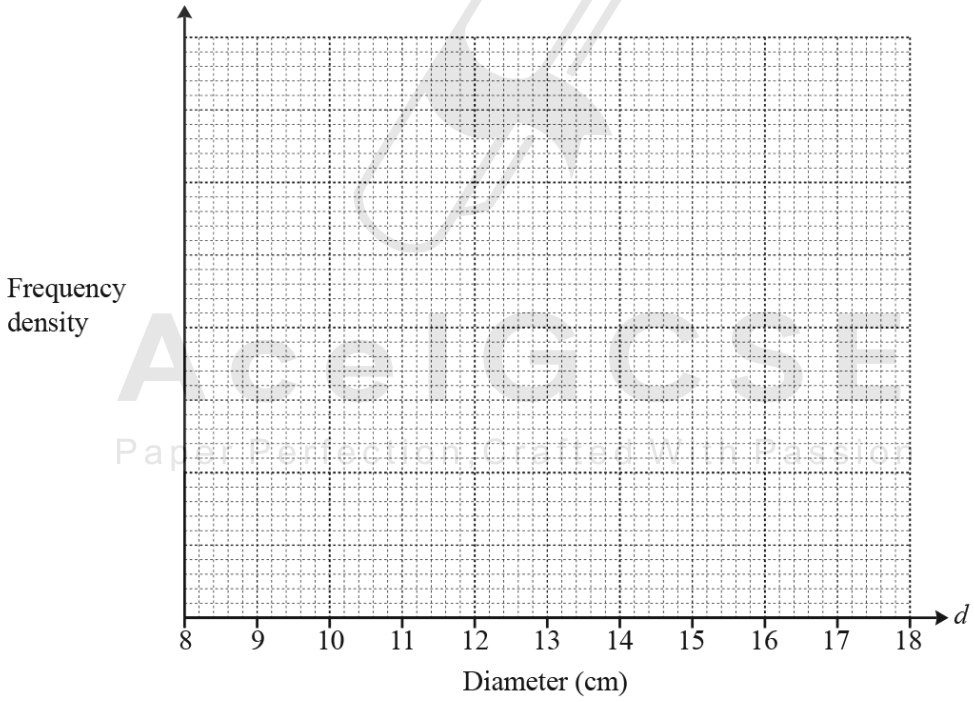
A farmer sorts the grapefruit he grows into sizes, according to their diameter.
The diameters, d cm, of 170 grapefruit are shown in the table.

Size	Small	Medium	Large	Very Large
Diameter (d cm)	$9 < d \leqslant 10$	$10 < d \leqslant 12$	$12 < d \leqslant 14$	$14 < d \leqslant 17$
Frequency	10	50	65	45

(a) Calculate an estimate of the mean diameter of the grapefruit.

..... cm [2]

(b) On the grid, draw a histogram to represent this information.
Complete the scale on the frequency density axis.



[4]

(c) Two of the 170 grapefruit are chosen at random.

Calculate the probability that

(i) they are both Very Large,

..... [2]

(ii) one is Small and the other is Medium.

..... [3]

25. 0607_s17_qp_43 Q: 10

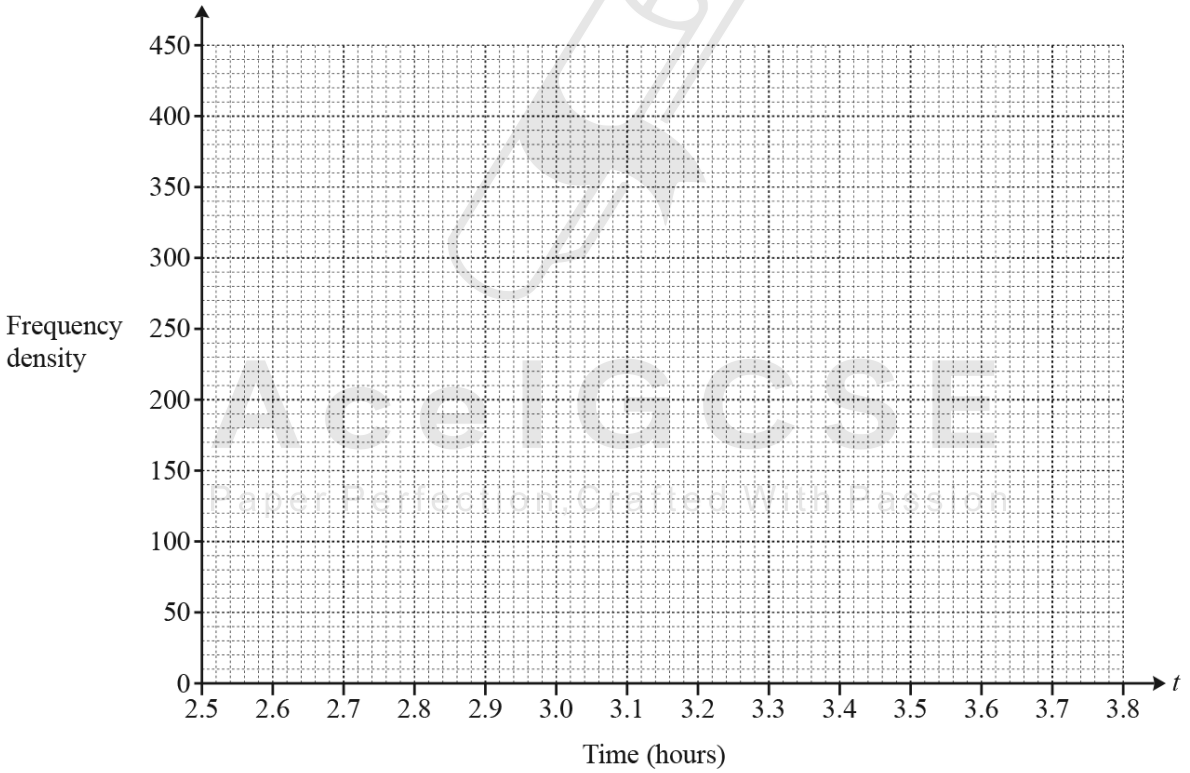
(a) The time, t hours, taken by each of 200 cars to complete a journey of 200 km is recorded. The results are shown in the table.

Time (t hours)	$2.5 < t \leqslant 3$	$3 < t \leqslant 3.25$	$3.25 < t \leqslant 3.75$
Frequency	60	100	40

(i) Calculate an estimate of the mean.

..... h [2]

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



[3]

(b) One car completes the 200 km journey at an average speed of x km/h.
Another car completes the 200 km journey at an average speed of $(x + 10)$ km/h.
The difference between the times taken by the two cars is 20 **minutes**.

(i) Show that $x^2 + 10x - 6000 = 0$.

[4]

(ii) Find the time taken for the slower journey.
Give your answer in hours and minutes correct to the nearest minute.

..... h ..... min [4]

26. 0607_w17_qp_41 Q: 1

These are 12 of Stefan's recent homework scores.

10 16 18 11 18 15 8 18 13 9 12 11

(a) Find

(i) the mode,

..... [1]

(ii) the range,

..... [1]

(iii) the median,

..... [1]

(iv) the mean,

..... [1]

(v) the interquartile range.

..... [2]

(b) The teacher wants to compare Stefan's scores with those of another student in the class.

Explain why the mode is not the best value to use to represent Stefan's scores.

.....

..... [1]

27. 0607_w17_qp_43 Q: 4

The masses of 120 peaches are recorded in the table.

Mass (m grams)	Frequency
$0 < m \leqslant 120$	12
$120 < m \leqslant 150$	27
$150 < m \leqslant 180$	33
$180 < m \leqslant 210$	15
$210 < m \leqslant 250$	28
$250 < m \leqslant 300$	5

(a) Calculate an estimate of the mean mass of a peach.
Give your answer correct to the nearest gram.

..... g [3]

(b) Two peaches are chosen at random.

Find the probability that they both have a mass of more than 210 g.
Give your answer as a fraction in its simplest form.

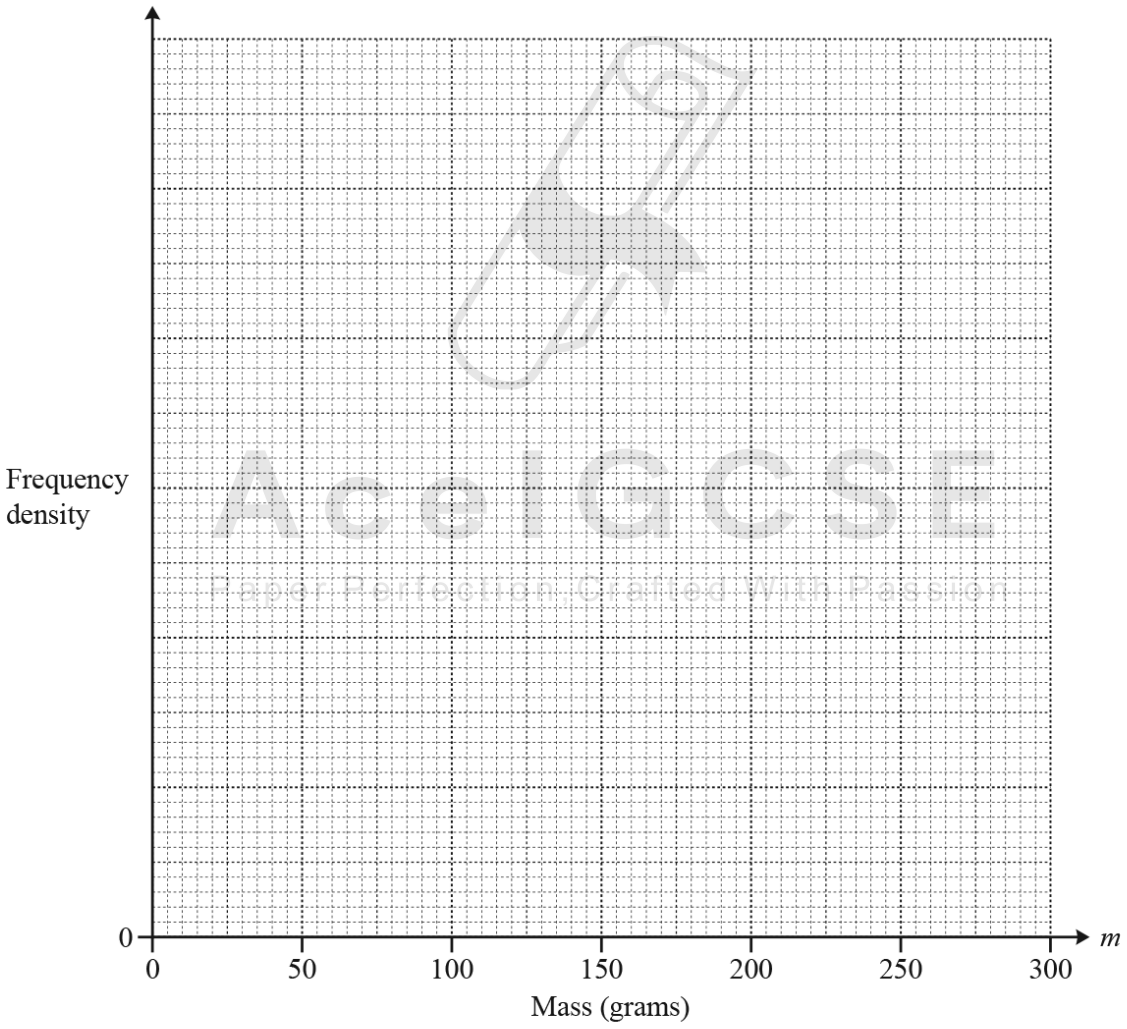
..... [3]

(i) Complete the frequency density column in this table.

Mass (m grams)	Frequency	Frequency density
$0 < m \leqslant 120$	12	
$120 < m \leqslant 150$	27	
$150 < m \leqslant 180$	33	
$180 < m \leqslant 210$	15	
$210 < m \leqslant 250$	28	
$250 < m \leqslant 300$	5	0.1

[2]

(ii) On the grid, draw an accurate histogram to show this information.



[4]

28. 0607_s16_qp_43 Q: 6

The heights of 400 students are given in the table.

Height (h cm)	Frequency
$145 < h \leqslant 155$	26
$155 < h \leqslant 160$	66
$160 < h \leqslant 165$	82
$165 < h \leqslant 170$	118
$170 < h \leqslant 175$	82
$175 < h \leqslant 190$	26

(a) Calculate an estimate of the mean height of a student.

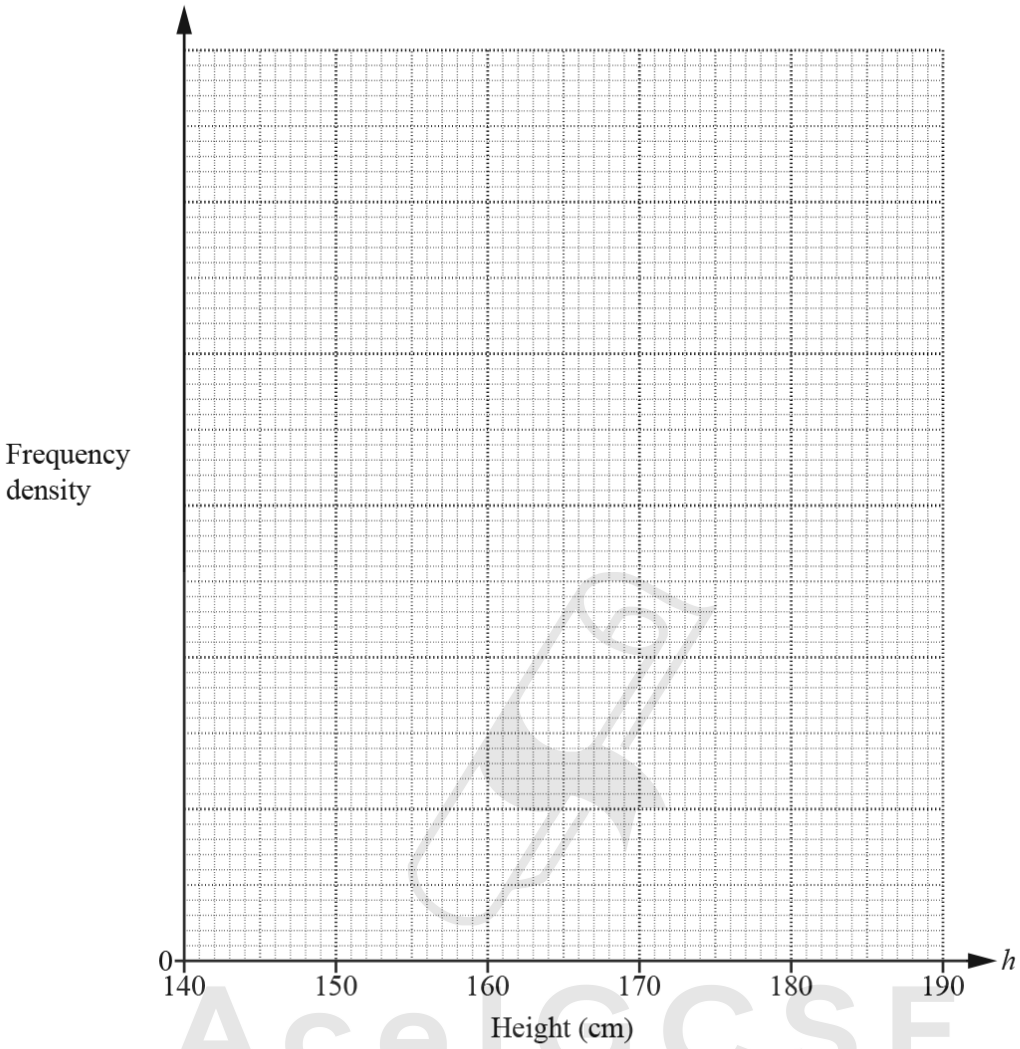
..... cm [2]

(b) **(i)** Complete the frequency density column in this table.

Height (h cm)	Frequency	Frequency density
$145 < h \leqslant 155$	26	
$155 < h \leqslant 160$	66	
$160 < h \leqslant 165$	82	
$165 < h \leqslant 170$	118	
$170 < h \leqslant 175$	82	
$175 < h \leqslant 190$	26	

[2]

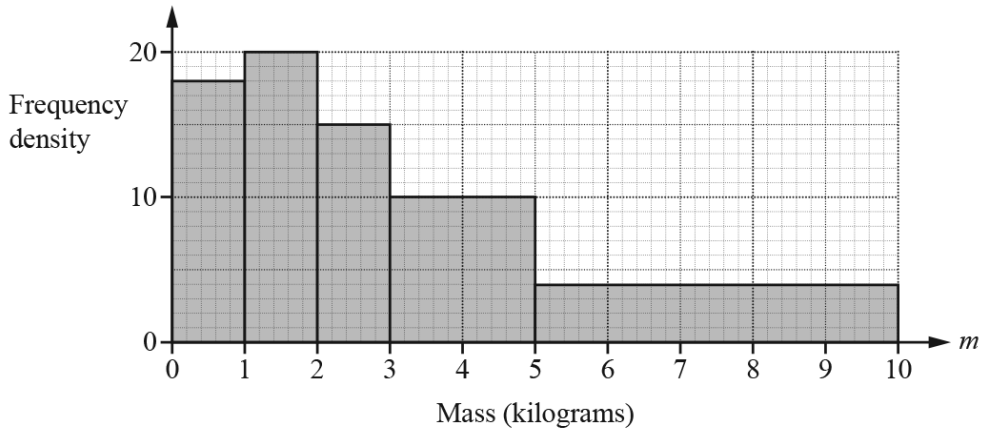
(ii) On the grid below, draw an accurate histogram to show this information.
Complete the scale on the frequency density axis.



[4]

29. 0607_w16_qp_41 Q: 9

In one day a delivery company delivers 93 parcels.
The histogram shows information about the masses, m kg, of these parcels.



(a) Complete the frequency table.

Mass (m kg)	$0 < m \leqslant 1$	$1 < m \leqslant 2$	$2 < m \leqslant 3$	$3 < m \leqslant 5$	$5 < m \leqslant 10$
Frequency					

[3]

(b) Calculate an estimate of the mean mass.

..... kg [2]

(c) Two parcels are chosen at random.

Find the probability that they both have a mass greater than 1 kg.
Give your answer as a decimal, correct to 3 significant figures.

..... [2]

30. 0607_w16_qp_42 Q: 1

The number of matches in each of 140 matchboxes are counted.
The table shows the results.

Number of matches	168	169	170	171	172	173	174	175	176	177	178
Number of matchboxes	7	13	16	23	22	21	14	11	8	3	2

(a) Write down the modal number of matches.

..... [1]

(b) Write down the range.

..... [1]

(c) Find the median.

..... [1]

(d) Find the inter-quartile range.

..... [2]

(e) Calculate the mean.
Give your answer correct to one decimal place.

..... [2]

31. 0607_s15_qp_41 Q: 1

The table shows the marks that 80 students scored in an examination.

Mark	0	1	2	3	4	5	6	7	8	9	10
Number of students	1	5	6	8	9	10	12	8	16	3	2

(a) Write down the mode.

Answer(a) ..... [1]

(b) Write down the range.

Answer(b) ..... [1]

(c) Find the median.

Answer(c) ..... [1]

(d) Find the interquartile range.

Answer(d) ..... [2]

(e) Calculate the mean.

Answer(e) ..... [1]

32. 0607_s15_qp_42 Q: 8

(a) Give an example of

(i) discrete data,

Answer(a)(i) ..... [1]

(ii) continuous data.

Answer(a)(ii) ..... [1]

(b) The table shows the heights, h cm, of 30 students in a class.

Height (h cm)	$150 < h \leqslant 155$	$155 < h \leqslant 160$	$160 < h \leqslant 165$	$165 < h \leqslant 170$	$170 < h \leqslant 175$	$175 < h \leqslant 18$
Frequency	2	4	8	7	5	4

(i) Write down the modal interval.

Answer(b)(i) ..... $< h \leqslant$ ..... [1]

(ii) Write down the interval that contains the median.

Answer(b)(ii) ..... $< h \leqslant$ ..... [1]

(iii) Calculate an estimate of the mean.

Answer(b)(iii) ..... cm [2]

(iv) Explain why the answer to **part (b)(iii)** is an estimate and not an exact answer.

Answer(b)(iv) .....

..... [1]

33. 0607_w15_qp_41 Q: 6

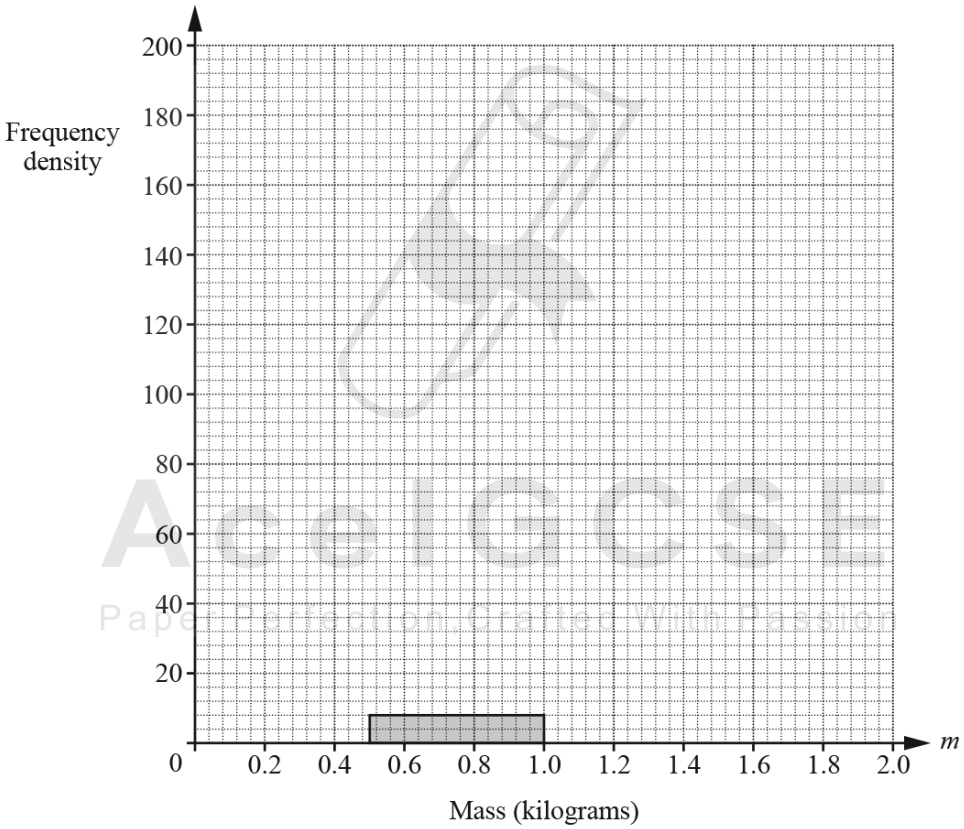
120 students estimate the mass, m kg, of a bag of oranges.
The frequency table shows the results.

Mass (m kg)	$0.5 < m \leqslant 1$	$1 < m \leqslant 1.2$	$1.2 < m \leqslant 1.4$	$1.4 < m \leqslant 1.6$	$1.6 < m \leqslant 2$
Frequency	4	36	40	32	8

(a) Calculate an estimate of the mean.

Answer(a) ..... kg [2]

(b) Complete the histogram to show the information in the table.



[3]

34. 0607_m21_qp_42 Q: 4

(a) The mass, m grams, of each of 50 apples is found.
The results are shown in the table.

Mass (m grams)	Frequency
$70 < m \leqslant 90$	2
$90 < m \leqslant 110$	7
$110 < m \leqslant 130$	14
$130 < m \leqslant 150$	10
$150 < m \leqslant 170$	12
$170 < m \leqslant 190$	5

(i) Write down the modal class.

..... $< m \leqslant$ ..... [1]

(ii) Calculate an estimate of the mean.

..... g [2]

(b) The mass, x grams, of each of 120 different apples is found.
The results are shown in Table 1.

(i) Complete the cumulative frequency column in Table 2.

Mass (x grams)	Frequency
$70 < x \leqslant 90$	8
$90 < x \leqslant 110$	8
$110 < x \leqslant 120$	22
$120 < x \leqslant 130$	39
$130 < x \leqslant 140$	27
$140 < x \leqslant 150$	9
$150 < x \leqslant 170$	7

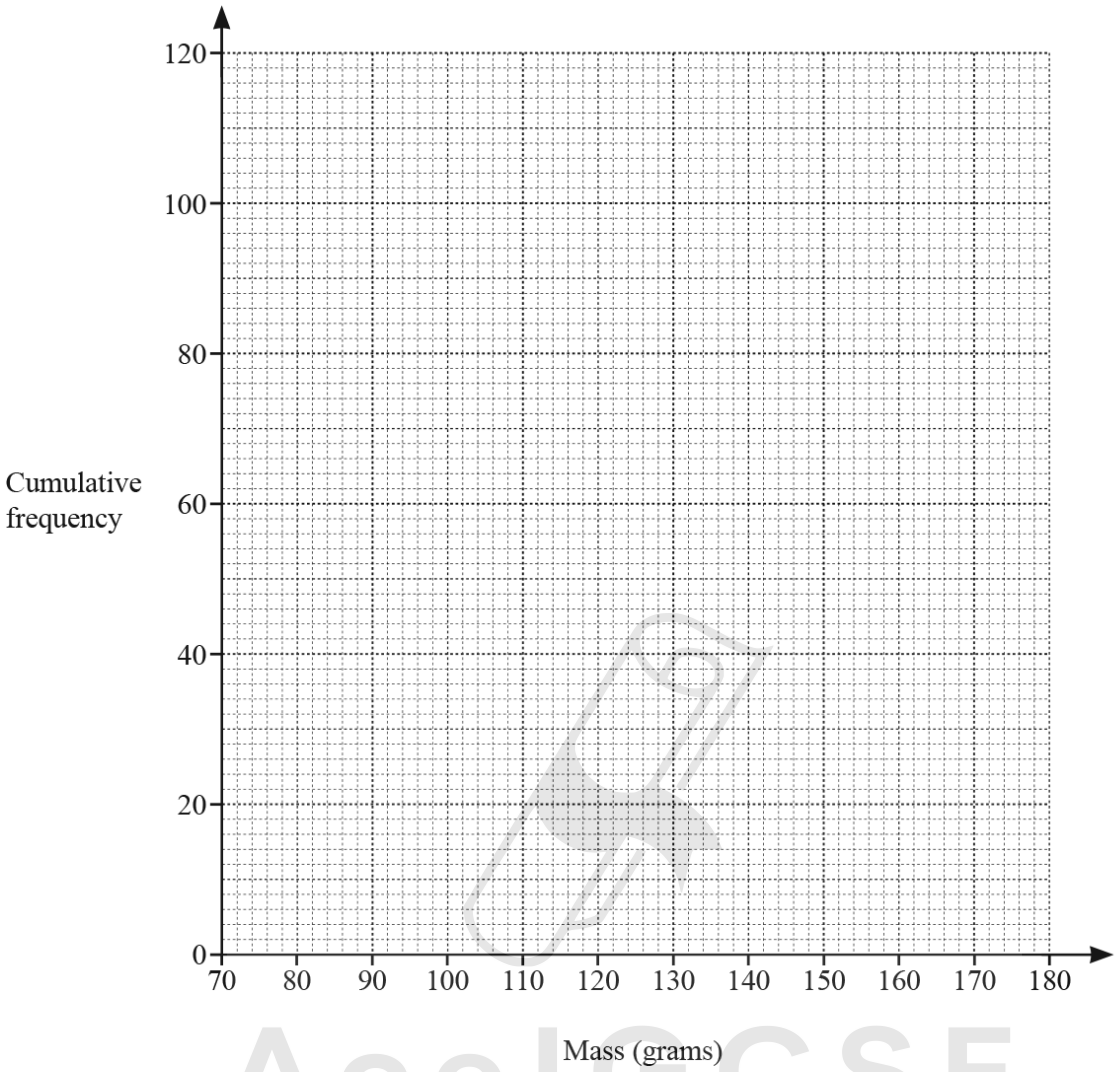
Table 1

Mass (x grams)	Cumulative Frequency
$x \leqslant 90$	8
$x \leqslant 110$	
$x \leqslant 120$	
$x \leqslant 130$	
$x \leqslant 140$	
$x \leqslant 150$	
$x \leqslant 170$	

Table 2

[2]

(ii) On the grid, draw the cumulative frequency curve to show the results in Table 2.



[3]

(iii) Use your cumulative frequency curve to estimate

(a) the median,

..... g [1]

(b) the interquartile range.

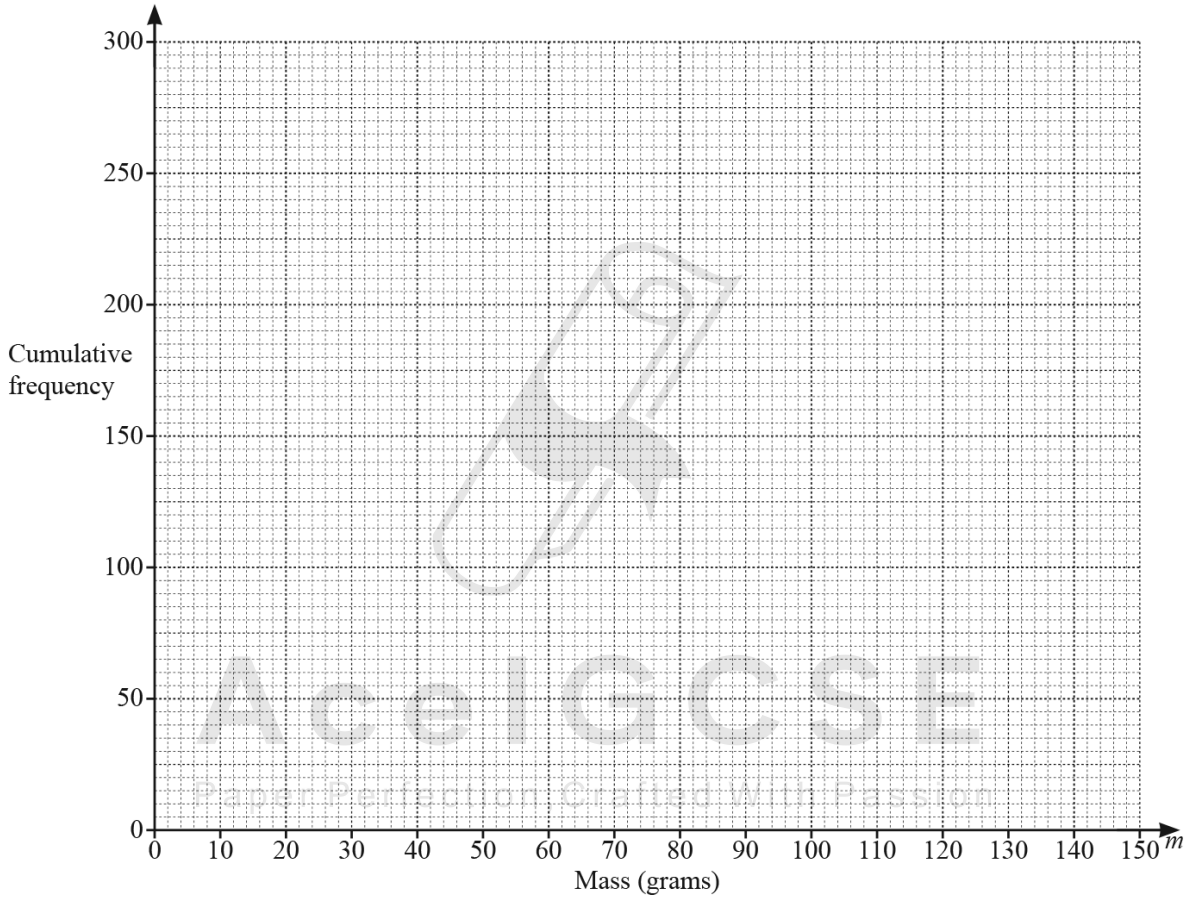
..... g [2]

35. 0607_w21_qp_41 Q: 6

The masses of 300 apples are shown in the table.

Mass (m grams)	$0 < m \leqslant 25$	$25 < m \leqslant 50$	$50 < m \leqslant 75$	$75 < m \leqslant 100$	$100 < m \leqslant 125$	$125 < m \leqslant 150$
Frequency	4	26	60	88	106	16

(a) Draw a cumulative frequency curve to show these results.



[4]

(b) Use your curve to find the interquartile range.

..... [2]

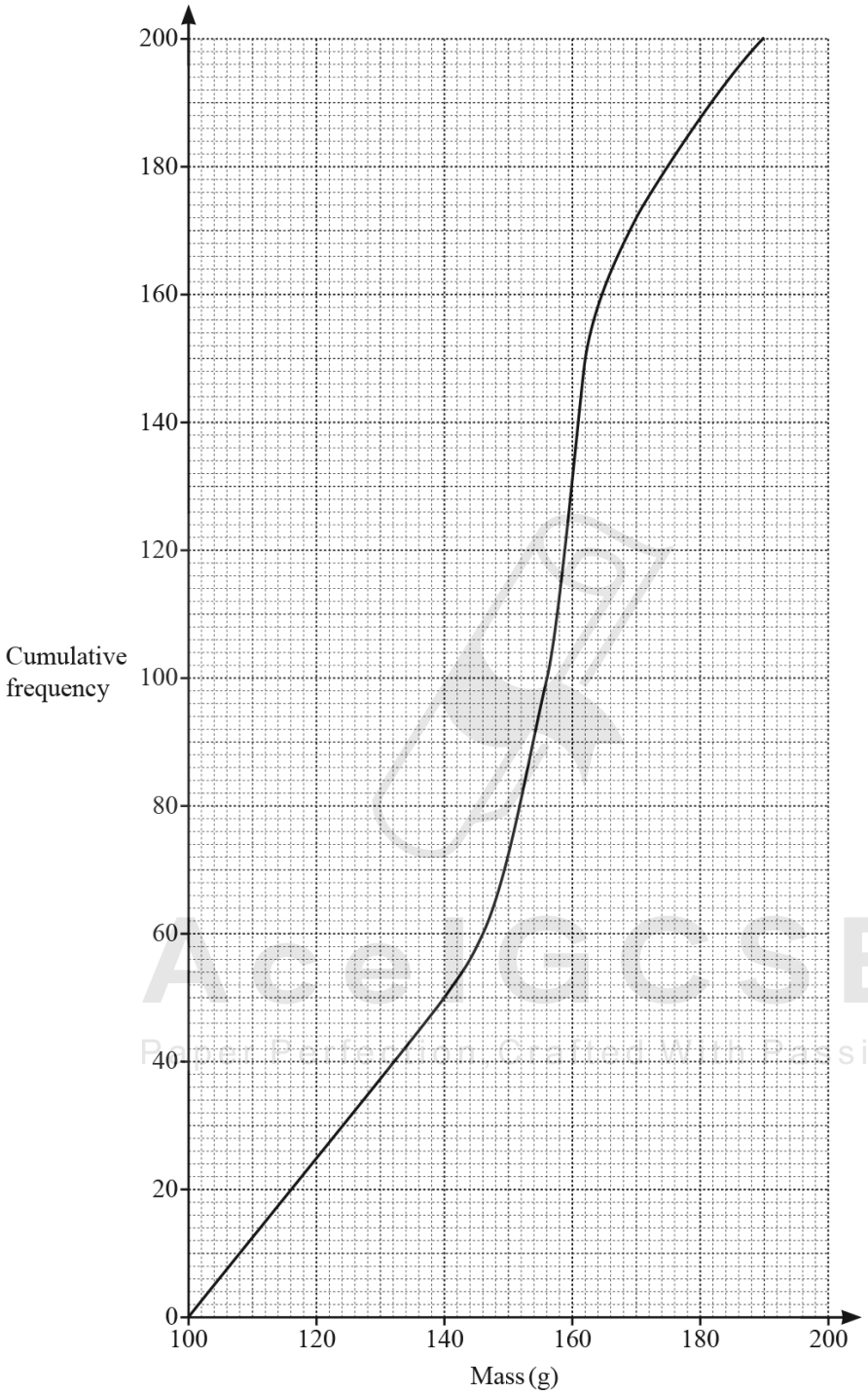
(c) Apples with a mass below 80 g are used to make drinks.

Find the percentage of the 300 apples that are used to make drinks.

.....% [2]

36. 0607_w21_qp_42 Q: 4

The mass of each of 200 potatoes is measured.
The cumulative frequency curve shows the results.



(a) **(i)** Write down the mass of the heaviest potato.

..... g [1]

(ii) Find the median.

..... g [1]

(iii) Find the interquartile range.

..... g [2]

(iv) Find the number of potatoes with a mass greater than 170 g.

..... [2]

(b) This frequency table also shows information about the masses of the 200 potatoes.

Mass (m g)	$100 < m \leqslant 140$	$140 < m \leqslant 146$	$146 < m \leqslant 162$	$162 < m \leqslant 190$
Frequency	50	10	90	50

Calculate an estimate of the mean mass.

..... g [2]

37. 0607_w21_qp_43 Q: 1

The table shows the marks scored by 180 students in an examination.

Mark	0	1	2	3	4	5	6	7	8	9	10
Number of students	3	7	16	11	7	32	20	26	28	19	11

(a) (i) Write down the mode.

..... [1]

(ii) Write down the range.

..... [1]

(iii) Find the median.

..... [1]

(iv) Find the interquartile range.

..... [2]

(v) Calculate the mean.

..... [2]

(b) A different group of 140 students take the same examination.
The marks of the two groups are combined and the mean mark of the 320 students is 6.5 .

Find the mean mark of the 140 students.

..... [2]

38. 0607_s20_qp_42 Q: 1

A class of 40 students complete a science test.
The table shows the marks of the 40 students.

Mark	0	1	2	3	4	5	6	7	8	9	10
Number of students	1	1	2	5	5	5	6	3	9	2	1

(a) Write down the mode.

..... [1]

(b) Work out the range.

..... [1]

(c) Find the median.

..... [1]

(d) Find the interquartile range.

..... [2]

(e) Calculate the mean.

..... [2]

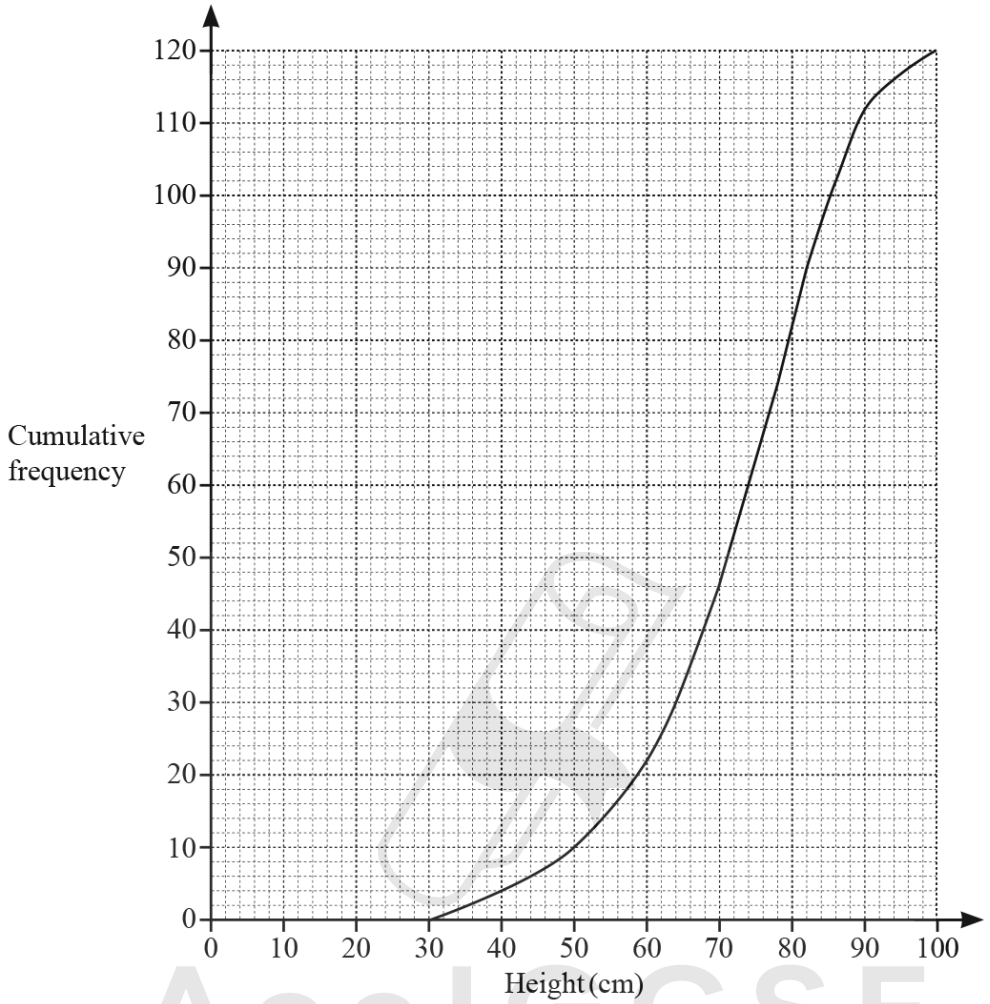
(f) Two of the students are chosen at random.

Find the probability that the difference in their marks is 8.

..... [3]

39. 0607_s20_qp_43 Q: 6

The cumulative frequency graph shows the heights, in centimetres, of 120 plants in location A.



(a) Use the graph to estimate

(i) the median,

..... cm [1]

(ii) the interquartile range,

..... cm [2]

(iii) the number of plants over 80 cm in height.

..... [2]

(b) The table gives some information about 120 similar plants in location B.

Minimum height (cm)	Lower quartile (cm)	Median (cm)	Interquartile range (cm)	Range (cm)
10	34	50	28	90

(i) On the grid opposite, draw the cumulative frequency curve for the heights of the plants in location B. [3]

(ii) Use the curves to estimate how many **more** plants had heights of over 70 cm in location A than in location B.

..... [2]

(iii) The heights of the plants in location A are more consistent than the heights of the plants in location B.

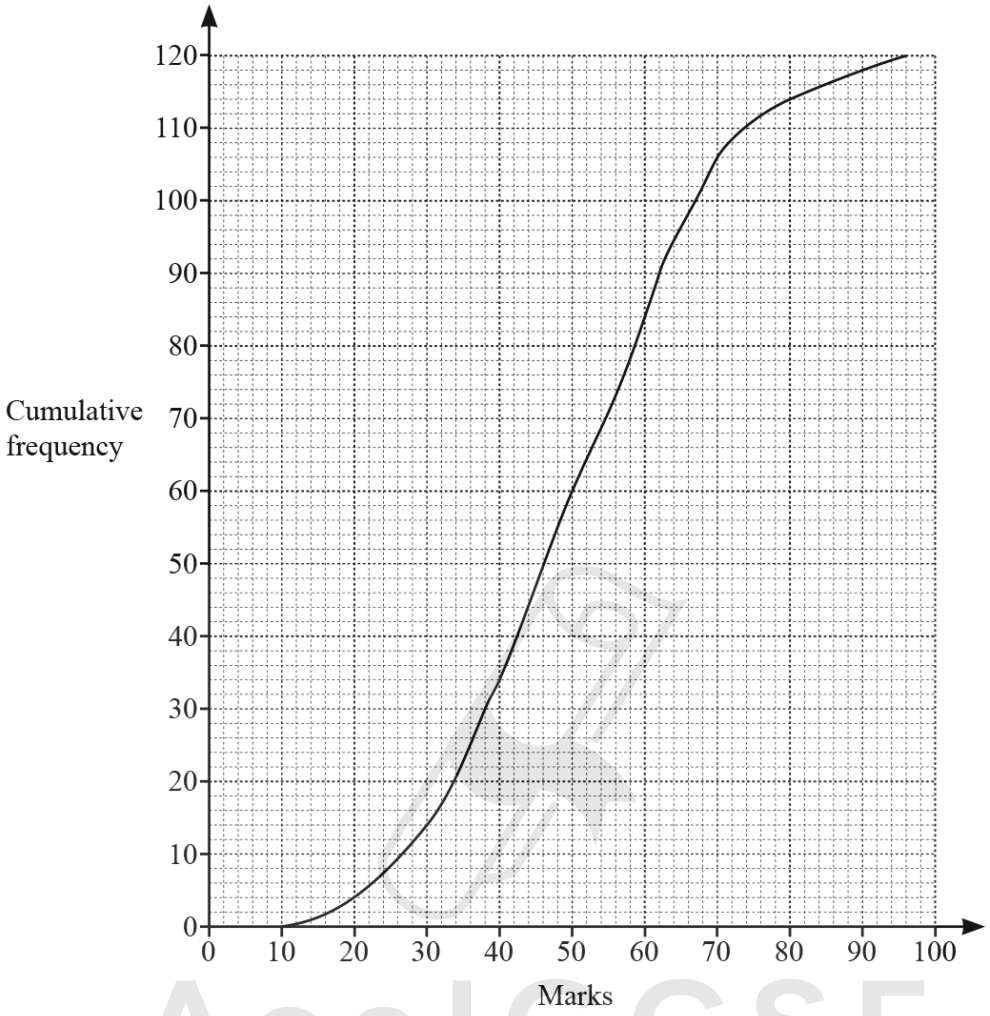
By comparing the **shapes** of the curves, explain how you know this is true.

.....

..... [1]

40. 0607_w20_qp_42 Q: 9

The cumulative frequency curve shows the marks of 120 students in an examination.



(a) Use the graph to estimate

(i) the median,

..... [1]

(ii) the interquartile range.

..... [2]

(b) The top 15% of the students gained a grade A in the examination.

Estimate the minimum mark for a grade A.

..... [3]

41. 0607_s19_qp_41 Q: 4

Rani planted some seeds in her garden.
After two months she measured the heights, h cm, of each of 120 plants.

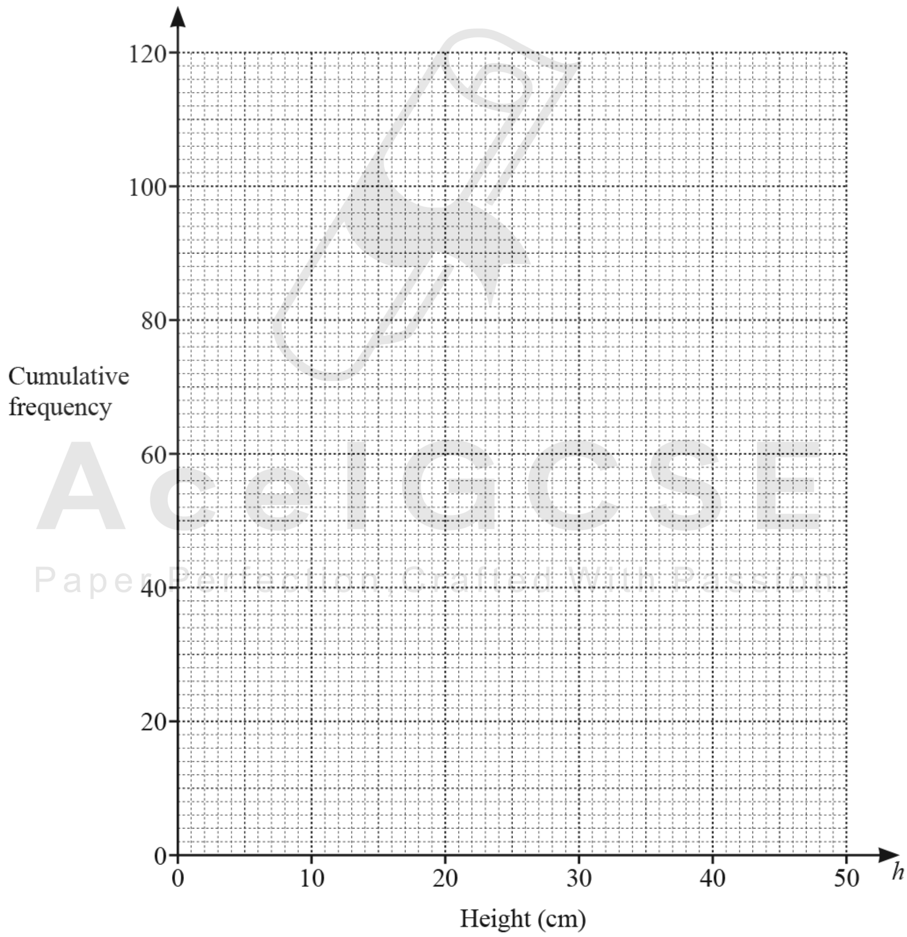
The results are shown in the table.

Height (h cm)	$0 < h \leqslant 10$	$10 < h \leqslant 20$	$20 < h \leqslant 25$	$25 < h \leqslant 30$	$30 < h \leqslant 35$	$35 < h \leqslant 40$	$40 < h \leqslant$
Frequency	0	16	28	32	24	14	6

(a) Calculate an estimate of the mean height.

.... cm [2]

(b) Draw a cumulative frequency curve for this information.



[5]

(c) Use your cumulative frequency curve to estimate

(i) the median height,

..... cm [1]

(ii) the interquartile range,

..... cm [2]

(iii) the number of plants with a height of more than 37 cm.

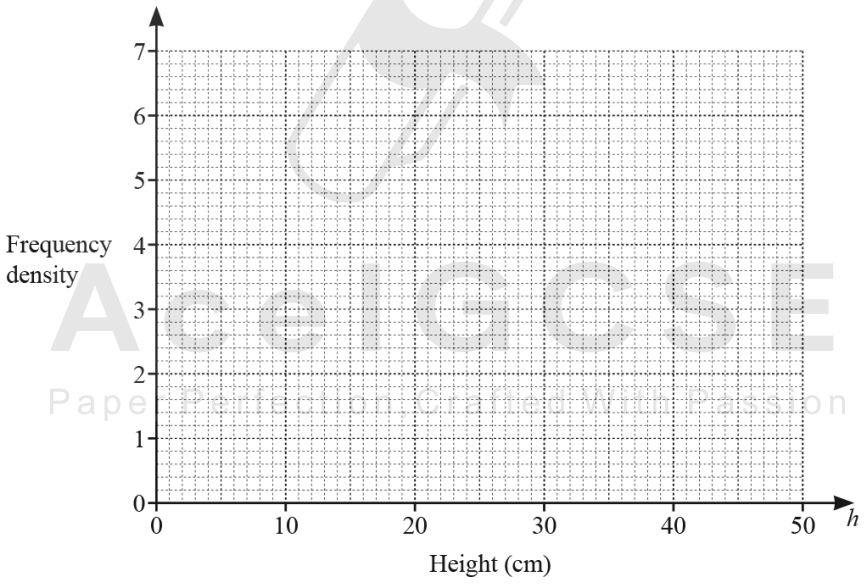
..... [2]

(d) **(i)** Complete this table of frequency densities for the 120 plants.

Height (h cm)	$0 < h \leqslant 10$	$10 < h \leqslant 20$	$20 < h \leqslant 25$	$25 < h \leqslant 30$	$30 < h \leqslant 35$	$35 < h \leqslant 40$	$40 < h \leqslant 50$
Frequency density	0	1.6					

[2]

(ii) Draw a histogram to show this information.



[3]

42. 0607_w19_qp_41 Q: 1

12 students are each given a spelling test.
Here is a list of the scores.

9	5	10	9	11	7	7	6	6	7	8	11

Find

(a) the range,

..... [1]

(b) the mode,

..... [1]

(c) the median,

..... [1]

(d) the upper quartile,

..... [1]

(e) the inter-quartile range,

..... [1]

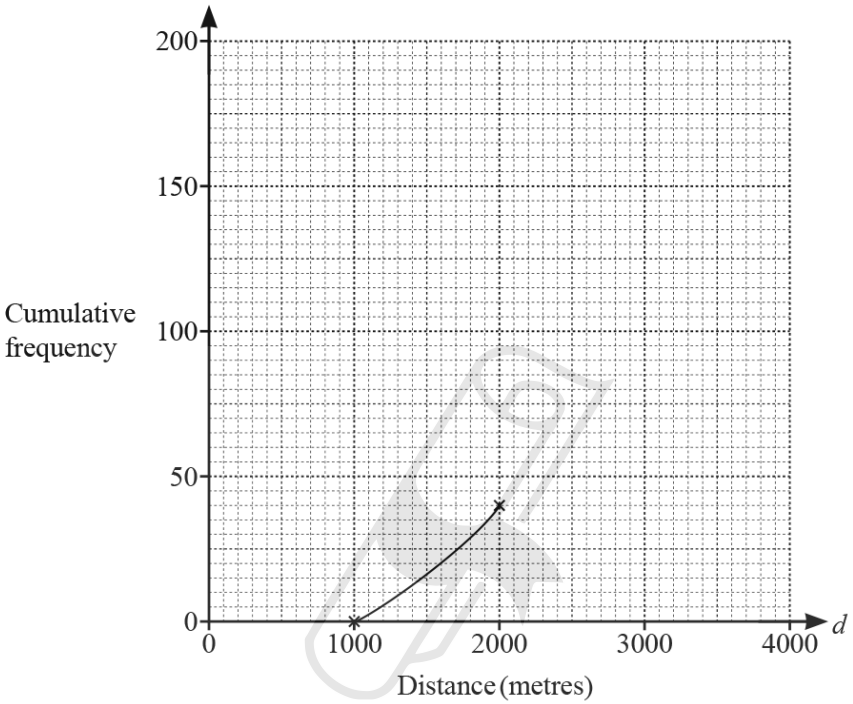
(f) the mean.

..... [1]

43. 0607_w19_qp_41 Q: 8

(a) 200 people took part in a charity walk.
They each recorded how far, d metres, they walked in one hour.
The table shows the results.

Distance (d metres)	$1000 < d \leqslant 2000$	$2000 < d \leqslant 2500$	$2500 < d \leqslant 3000$	$3000 < d \leqslant 4000$
Number of people	40	60	80	20



(i) Complete the cumulative frequency curve. [3]

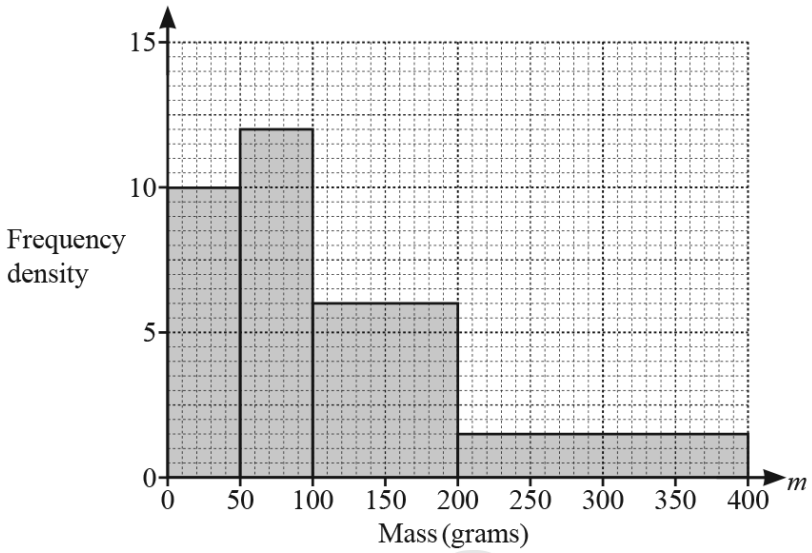
(ii) Use your curve to find the inter-quartile range.

..... m [2]

(iii) Use your curve to estimate the number of people who walked further than 3500 m.

..... [2]

(b) 2000 people took part in a "NO FOOD FOR 6 HOURS" day.
They each recorded the reduction in their mass, m grams, at the end of the day.
The histogram shows their results.



(i) Complete the frequency table.

Reduction in mass (m grams)	$0 < m \leqslant 50$	$50 < m \leqslant 100$	$100 < m \leqslant 200$	$200 < m \leqslant 400$
Number of people	500			

[2]

(ii) Calculate an estimate of the mean.

..... g [2]

44. 0607_w19_qp_42 Q: 10

The mass of each of 80 apples is shown in the table.

Mass (m grams)	Frequency
$0 < m \leqslant 100$	6
$100 < m \leqslant 120$	22
$120 < m \leqslant 140$	31
$140 < m \leqslant 160$	13
$160 < m \leqslant 250$	8

(a) Calculate an estimate of the mean mass of an apple.

..... g [2]

(b) Find the interval which contains the upper quartile.

..... $< m \leqslant$ ..... [1]

(c) Two of these apples are chosen at random.

Find the probability that they both have a mass of 120 g or less.
Give your answer as a fraction in its simplest form.

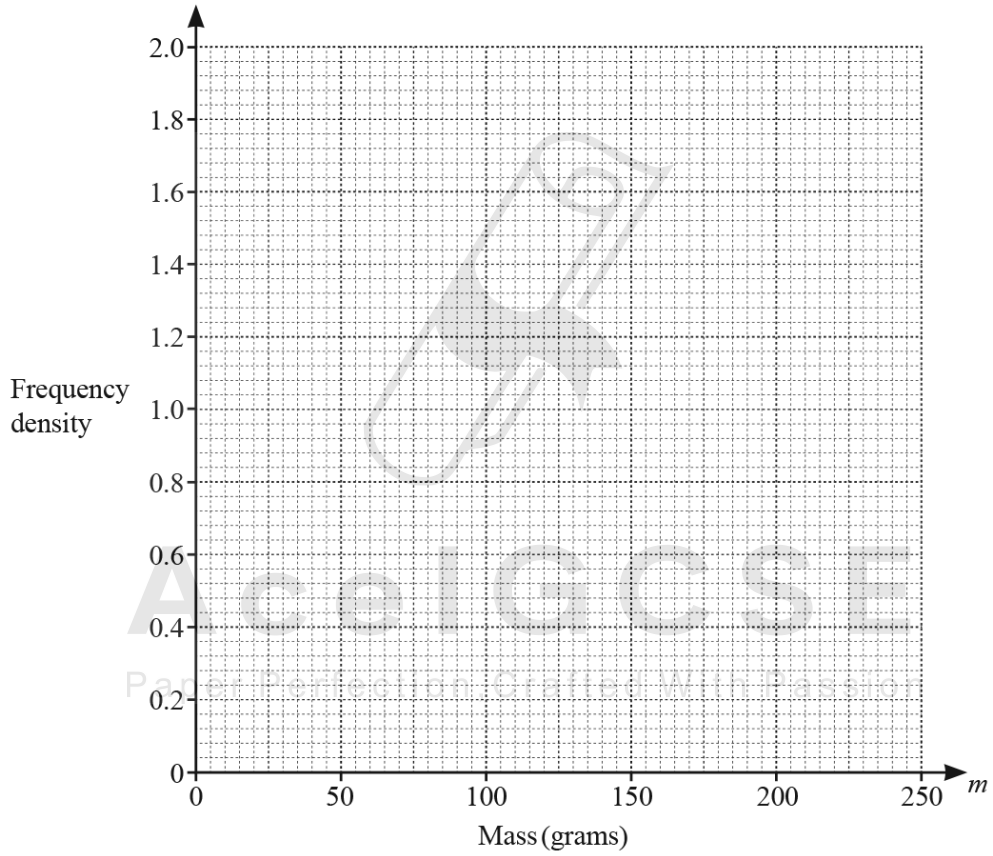
..... [3]

(d) **(i)** Complete the frequency density column in this table.

Mass (m grams)	Frequency	Frequency density
$0 < m \leqslant 100$	6	
$100 < m \leqslant 120$	22	
$120 < m \leqslant 140$	31	
$140 < m \leqslant 160$	13	
$160 < m \leqslant 250$	8	

[2]

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



[3]

45. 0607_w19_qp_43 Q: 2

The table shows the number of goals scored in 100 matches.

Number of goals	0	1	2	3	4	5	6	7
Frequency	17	23	20	18	11	6	4	1

Find

(a) the mode,

..... [1]

(b) the range,

..... [1]

(c) the median,

..... [1]

(d) the inter-quartile range,

..... [2]

(e) the mean.

..... [2]

46. 0607_s18_qp_41 Q: 4

(a) The list shows the temperature, in degrees Celsius, at noon in Paris on each of 14 days.

19	18	21	21	23	21	22
20	24	25	22	21	19	17

(i) Construct an ordered stem and leaf diagram to show this information, including the key.

Key .... | .... = ...

[3]

(ii) Find the median and the lower quartile.

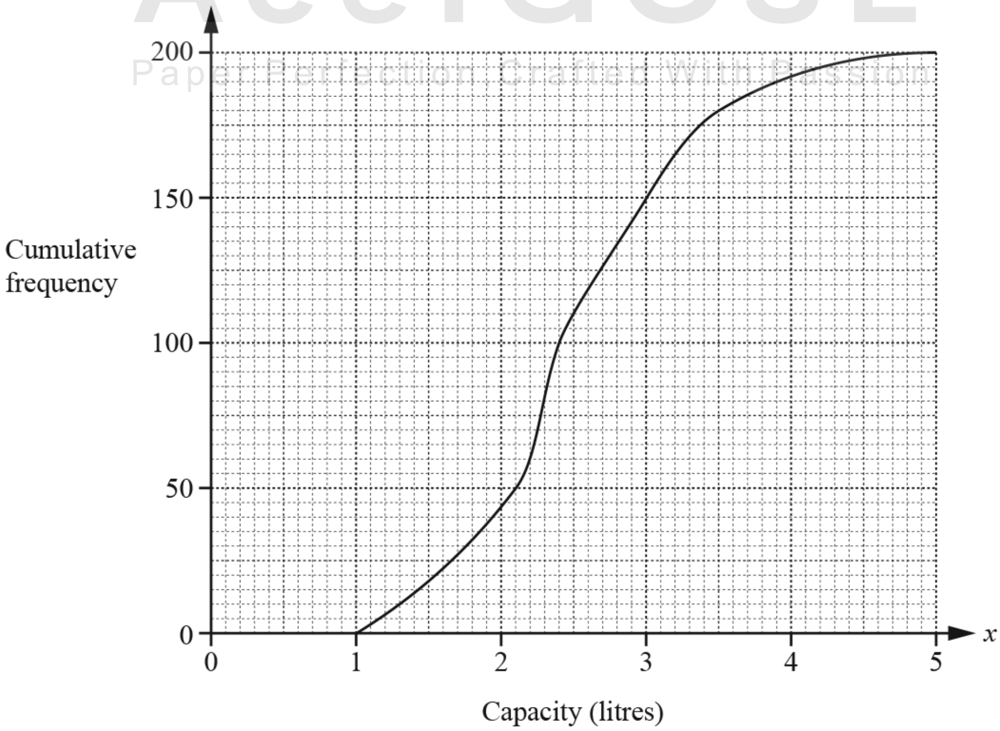
median = ...

lower quartile = ... [2]

(iii) Find the angle on a pie chart that represents the number of days the temperature was less than 20 °C.

.... [2]

(b) 200 students estimated the capacity, x litres, of a container.
The results are shown in the cumulative frequency curve.



Find

(i) the median, ... litres [1]

(ii) the inter-quartile range,

.... litres [2]

(iii) the number of students who estimated more than 3.5 litres.

.... [2]

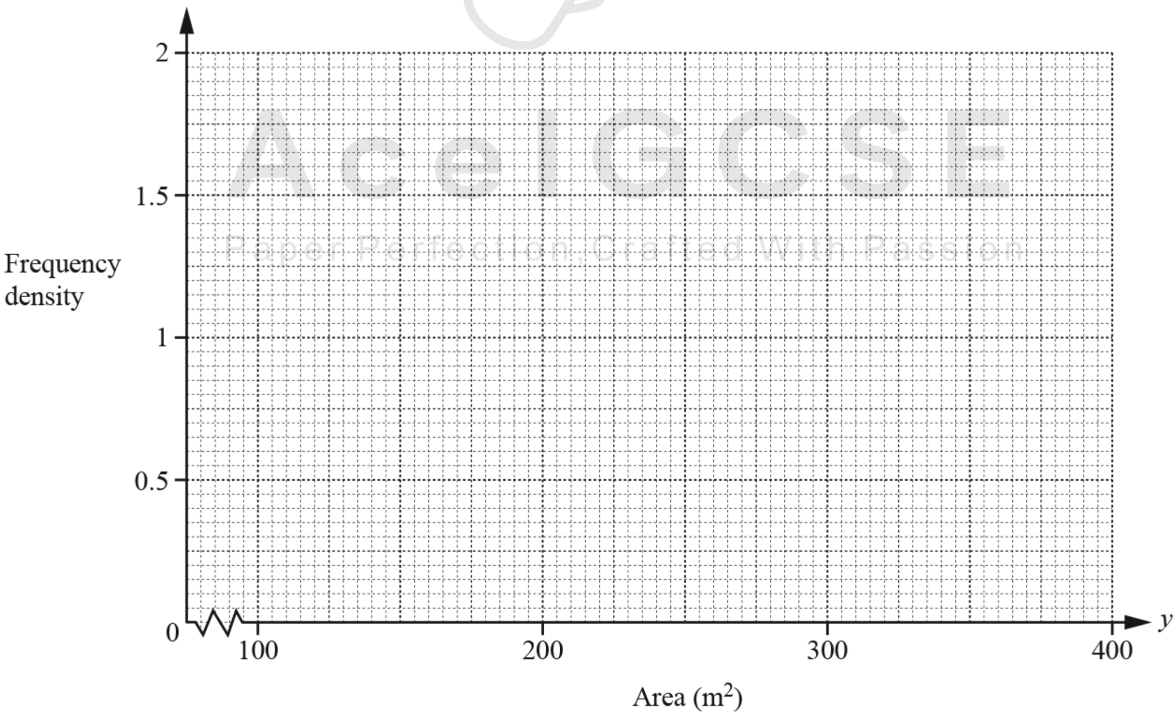
(c) 200 students estimated the area, $y\,\text{m}^2$, of a field.
The table shows the results.

Area ($y\,\text{m}^2$)	$100 < y \leqslant 200$	$200 < y \leqslant 250$	$250 < y \leqslant 400$
Frequency	25	100	75

(i) Calculate an estimate of the mean.

.... m^2 [2]

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



[4]

47. 0607_s18_qp_43 Q: 1

Gunter keeps chickens.
He records the number of eggs he collects each day for 31 days.
These are the results.

Number of eggs	10	11	12	13	14	15	16	17	18	19	20
Number of days	5	3	2	3	2	3	2	4	4	1	2

(a) Write down the range of the numbers of eggs.

.....[1]

(b) Find the inter-quartile range.

.....[2]

(c) Write down the mode.

.....[1]

(d) Find the median.

.....[1]

(e) Find the mean.

.....[2]

(f) Explain why the mode is not the best measure of average to represent these results.

.....[1]

48. 0607_w18_qp_41 Q: 2

The table shows the marks for 75 students in a test.

Mark	0	1	2	3	4	5, 6 or 7	8
Number of students	6	18	16	8	15	5	7

(a) Write down the mode.

..... [1]

(b) Find the range.

..... [1]

(c) Find the median.

..... [1]

(d) Find the inter-quartile range.

..... [2]

(e) Calculate an estimate of the mean.

..... [2]

(f) Give a reason why your answer to **part (e)** is an estimate.

.....

..... [1]

(g) Two of these students are chosen at random.

Find the probability that the highest mark of these students is 2.

..... [3]

49. 0607_w18_qp_42 Q: 2

Here are 12 numbers.

15 9 6 14 6 8 12 21 11 19 6 12

(a) For these numbers find

(i) the range,

..... [1]

(ii) the mode,

..... [1]

(iii) the median,

..... [1]

(iv) the mean,

..... [1]

(v) the inter-quartile range.

..... [2]

(b) Dee chooses a number at random from these numbers.

Find the probability that it is a prime number.

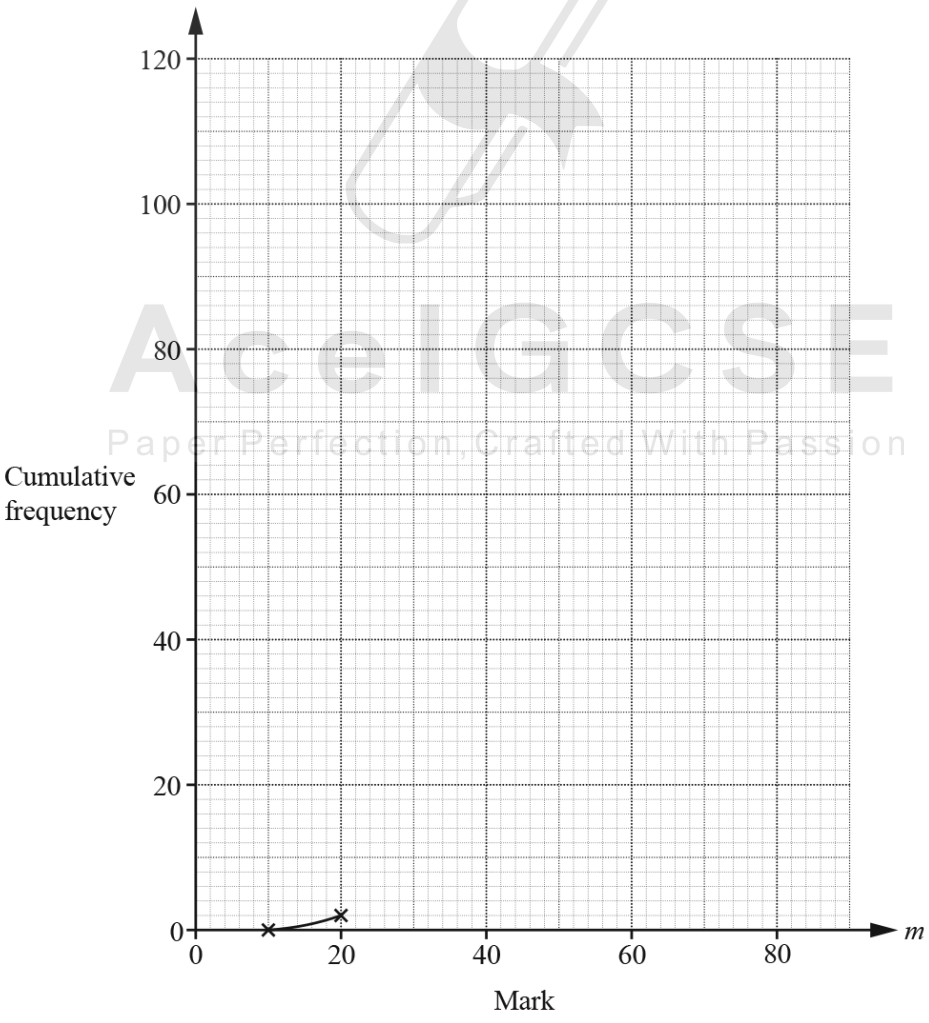
..... [1]

50. 0607_w18_qp_42 Q: 9

120 students each took two mathematics examinations, Paper 1 and Paper 2.
The marks for Paper 1 are shown below.

Mark (m)	Frequency
$10 < m \leqslant 20$	2
$20 < m \leqslant 30$	4
$30 < m \leqslant 40$	6
$40 < m \leqslant 50$	12
$50 < m \leqslant 60$	22
$60 < m \leqslant 70$	34
$70 < m \leqslant 80$	28
$80 < m \leqslant 90$	12

(a) Complete the cumulative frequency diagram to show the results.
The first section has been drawn for you.



[4]

(b) Use your cumulative frequency diagram to estimate

(i) the median mark,

..... [1]

(ii) the inter-quartile range,

..... [2]

(iii) the number of students with a mark greater than 84.

..... [2]

(c) The table below shows some information about Paper 2.

Lowest mark	4
Highest mark	80
Median	44
Lower Quartile	32
Inter-quartile range	24

On the grid opposite, draw the cumulative frequency diagram for Paper 2. [3]

51. 0607_s17_qp_41 Q: 2

(a) The heights, x cm, of some plants are shown in the table.

Height (x cm)	Frequency
$0 < x \leqslant 10$	7
$10 < x \leqslant 20$	13
$20 < x \leqslant 30$	20
$30 < x \leqslant 40$	32
$40 < x \leqslant 50$	28

Calculate an estimate of the mean height of the plants.

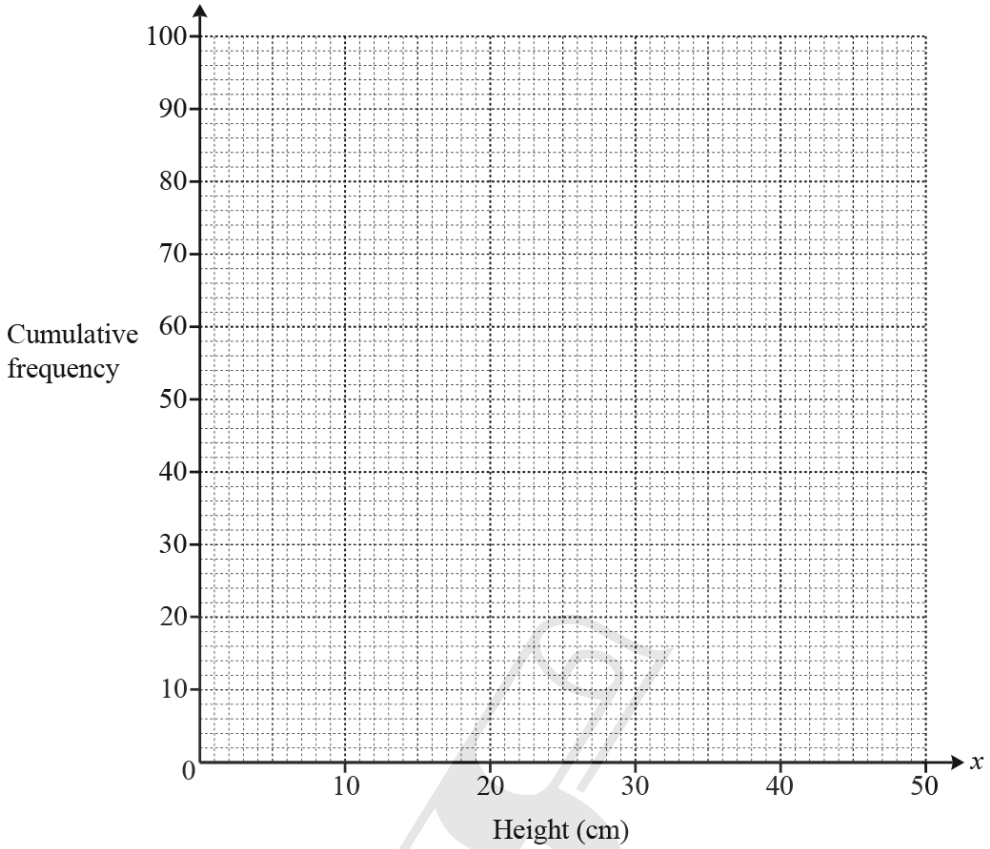
..... cm [2]

(b) **(i)** Complete the cumulative frequency table for the plants.

Height (x cm)	Cumulative Frequency
$0 < x \leqslant 10$	7
$0 < x \leqslant 20$	
$0 < x \leqslant 30$	
$0 < x \leqslant 40$	
$0 < x \leqslant 50$	

[1]

(ii) On the grid below, draw the cumulative frequency curve.



[3]

(c) Use your graph in **part (b)(ii)** to find estimates for

(i) the median height,

..... cm [1]

(ii) the interquartile range,

..... cm [2]

(iii) the range of heights of plants that are between the 45th and the 55th percentile.

..... cm [3]

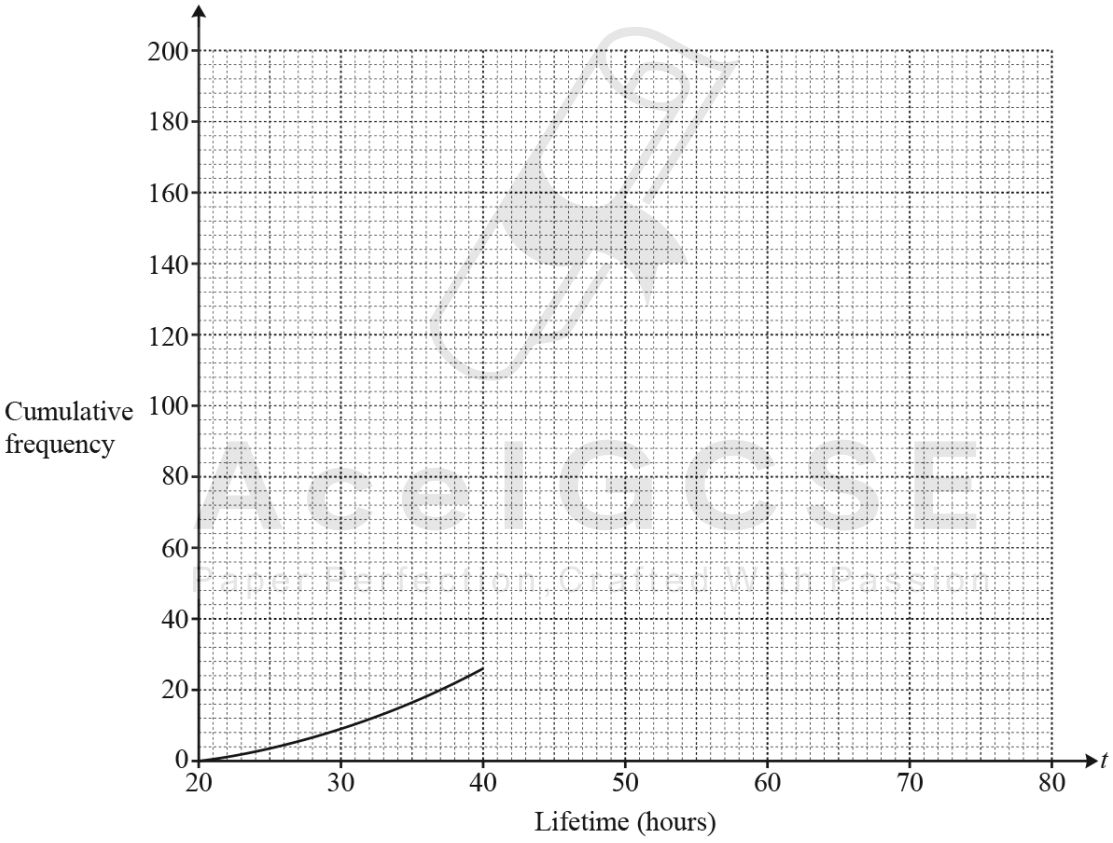
52. 0607_w17_qp_42 Q: 6

(a) A factory tests the lifetime, t hours, of each of 200 batteries.
The table shows the results.

Lifetime (t hours)	$20 < t \leqslant 30$	$30 < t \leqslant 40$	$40 < t \leqslant 50$	$50 < t \leqslant 60$	$60 < t \leqslant 70$	$70 < t \leqslant 80$
Frequency	9	17	39	97	29	9

(i) Write down the modal interval. ..... [1]

(ii) Complete the **cumulative** frequency curve.



[4]

(iii) Use your curve to find

(a) the median,

..... hours [1]

(b) the number of batteries with a lifetime greater than 65 hours.

..... [2]

(b) This table shows the lifetimes of **the same** batteries but the time intervals are different.

Lifetime (t hours)	$20 < t \leqslant 40$	$40 < t \leqslant 50$	$50 < t \leqslant 55$	$55 < t \leqslant 60$	$60 < t \leqslant 80$
Frequency	26	39	55	42	38

(i) Calculate an estimate of the mean.

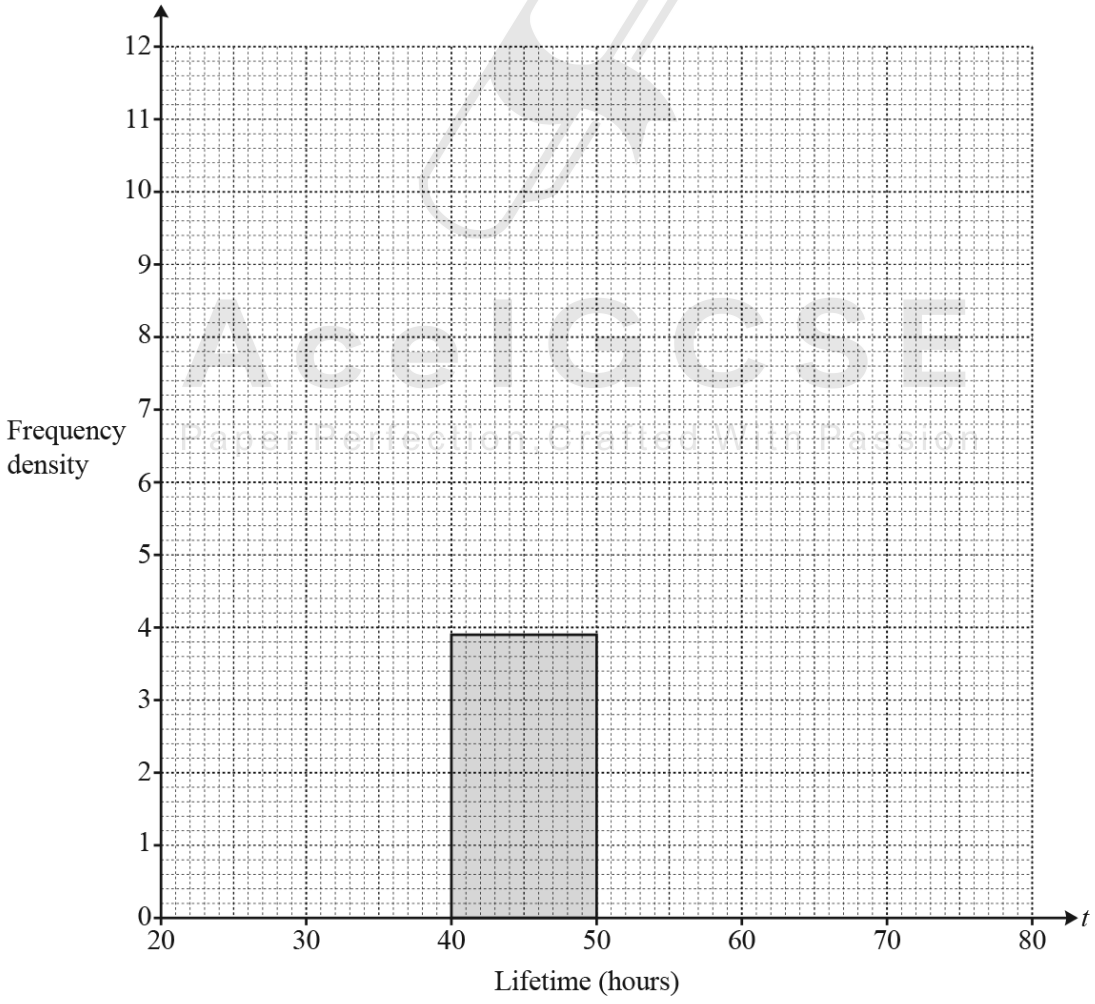
..... hours [2]

(ii) Complete the table to show the frequency densities.

Lifetime (t hours)	$20 < t \leqslant 40$	$40 < t \leqslant 50$	$50 < t \leqslant 55$	$55 < t \leqslant 60$	$60 < t \leqslant 80$
Frequency	26	39	55	42	38
Frequency density		3.9			

[2]

(iii) Complete the histogram.



[3]

53. 0607_s16_qp_41 Q: 12

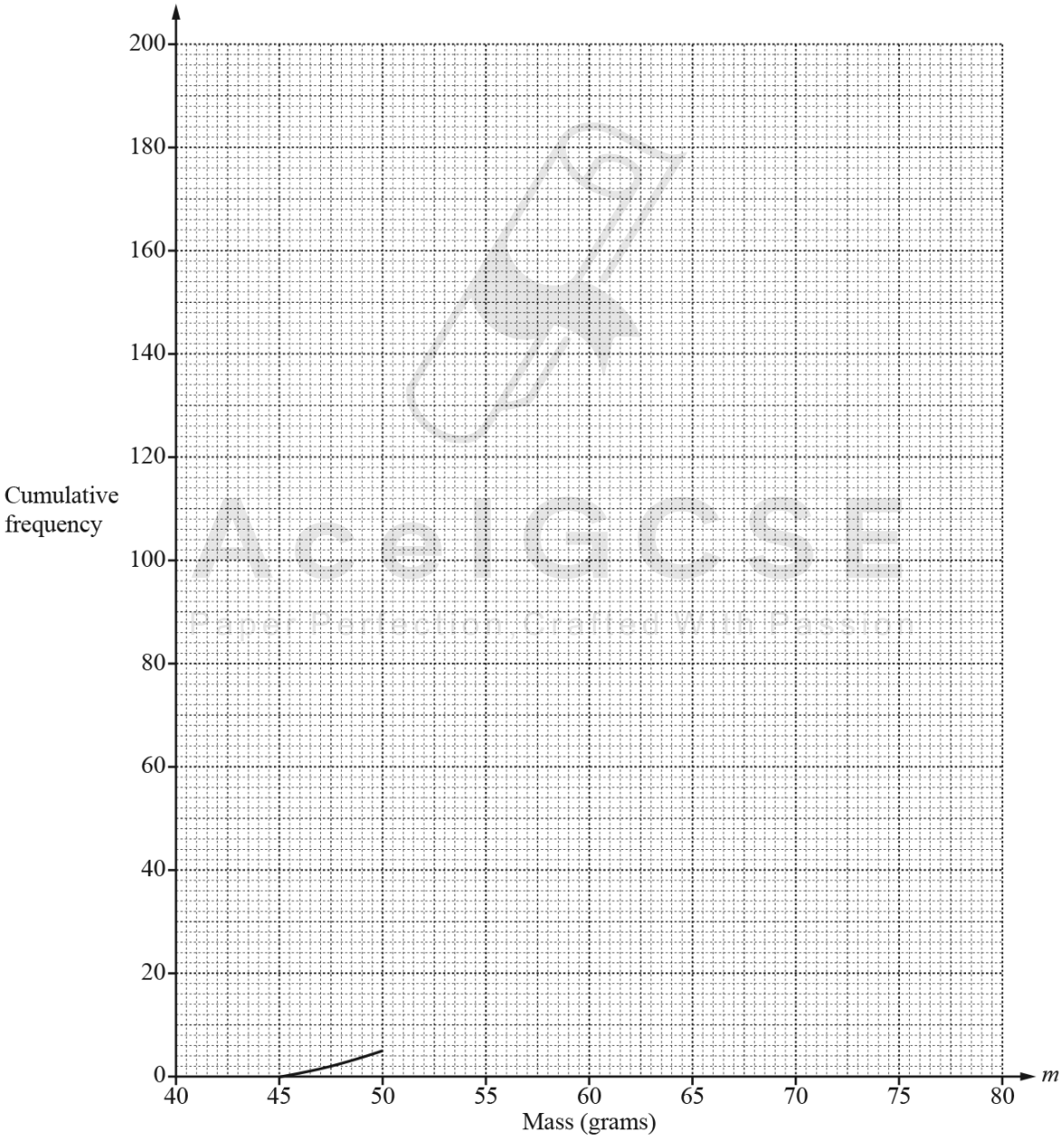
The table shows the masses in grams of 200 eggs.

Mass (m grams)	$45 < m \leqslant 50$	$50 < m \leqslant 55$	$55 < m \leqslant 60$	$60 < m \leqslant 65$	$65 < m \leqslant 70$	$70 < m \leqslant 75$	$75 < m \leqslant 80$
Frequency	5	19	34	58	46	29	9

(a) Calculate an estimate of the mean mass.

..... g [2]

(b) On the grid, complete the cumulative frequency curve for the information in the table.



[5]

(c) Use your graph to find

(i) the median mass,

..... g [1]

(ii) the interquartile range.

..... g [2]

(d) This table shows how the eggs are graded according to their mass.

Size	Small	Medium	Large	Very Large
Mass (m grams)	$m \leqslant 53$	$53 < m \leqslant 63$	$63 < m \leqslant 75$	$m > 75$

(i) An egg is chosen at random from the 200 eggs.

Estimate the probability that the egg is Small.

..... [1]

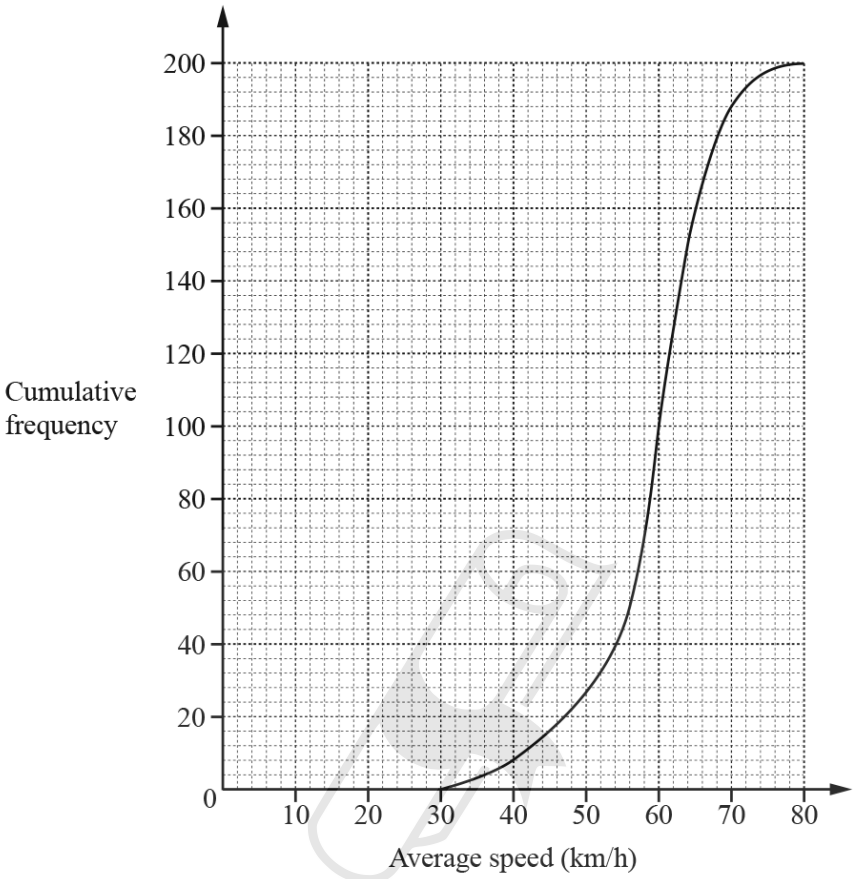
(ii) Two eggs are chosen from the 200 eggs.

Find the probability that both are Very Large.

..... [2]

54. 0607_s16_qp_42 Q: 3

(a) The cumulative frequency curve shows information about the average speeds of 200 cars on the same journey.



(i) Find the median.

..... km/h [1]

(ii) Find the inter-quartile range.

..... km/h [2]

(iii) Find the number of cars with an average speed of more than 70 km/h.

..... [2]

(b) A bus completes a journey in 2 h 24 min at an average speed of 50 km/h.
A car completes the same journey in 1 h 45 min.

Calculate the average speed of the car.

..... km/h [3]

55. 0607_w16_qp_42 Q: 5

The age, h, of each of 120 passengers travelling on a train are shown in the table.

Age (years)	Frequency
$0 < h \leqslant 15$	12
$15 < h \leqslant 20$	18
$20 < h \leqslant 25$	13
$25 < h \leqslant 35$	27
$35 < h \leqslant 50$	22
$50 < h \leqslant 90$	28

(a) Calculate an estimate of the mean age of a passenger.

.....years [2]

(b) Complete the frequency density column in this table.

Age (years)	Frequency	Frequency density
$0 < h \leqslant 15$	12	
$15 < h \leqslant 20$	18	
$20 < h \leqslant 25$	13	
$25 < h \leqslant 35$	27	
$35 < h \leqslant 50$	22	
$50 < h \leqslant 90$	28	

[3]

56. 0607_s15_qp_43 Q: 8

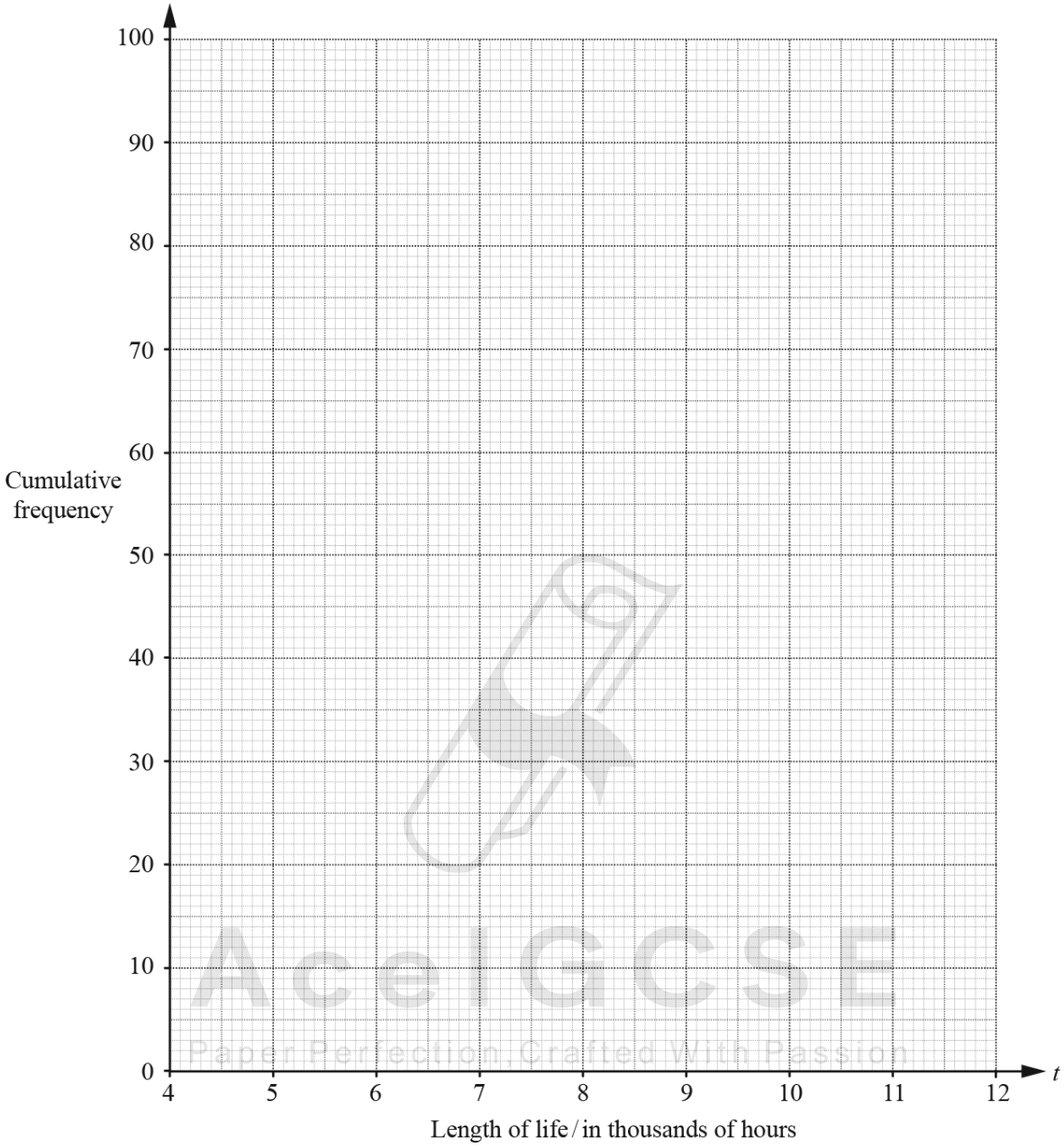
100 light bulbs were tested.
The length of life, t, in thousands of hours was recorded.
The results are shown in this table.

Length of life (t) in thousands of hours	$4 < t \leqslant 5$	$5 < t \leqslant 6$	$6 < t \leqslant 7$	$7 < t \leqslant 8$	$8 < t \leqslant 9$	$9 < t \leqslant 10$	$10 < t \leqslant 12$
Frequency	8	21	31	23	10	5	2

(a) Calculate an estimate of the mean value of t.

Answer(a) ..... [2]

(b) Draw a cumulative frequency curve for the length of life of the light bulbs.



[5]

(c) Use your graph to estimate

(i) the number of light bulbs that lasted longer than 8500 hours,

Answer(c)(i) ..... [2]

(ii) the interquartile range.

Answer(c)(ii) ..... hours [2]

57. 0607_w15_qp_42 Q: 6

The marks, x, of 800 students in a mathematics exam are given in the table.

Mark (x)	Frequency
$0 < x \leqslant 20$	62
$20 < x \leqslant 30$	84
$30 < x \leqslant 40$	140
$40 < x \leqslant 50$	160
$50 < x \leqslant 60$	142
$60 < x \leqslant 80$	112
$80 < x \leqslant 100$	100

(a) Calculate an estimate of the mean mark.

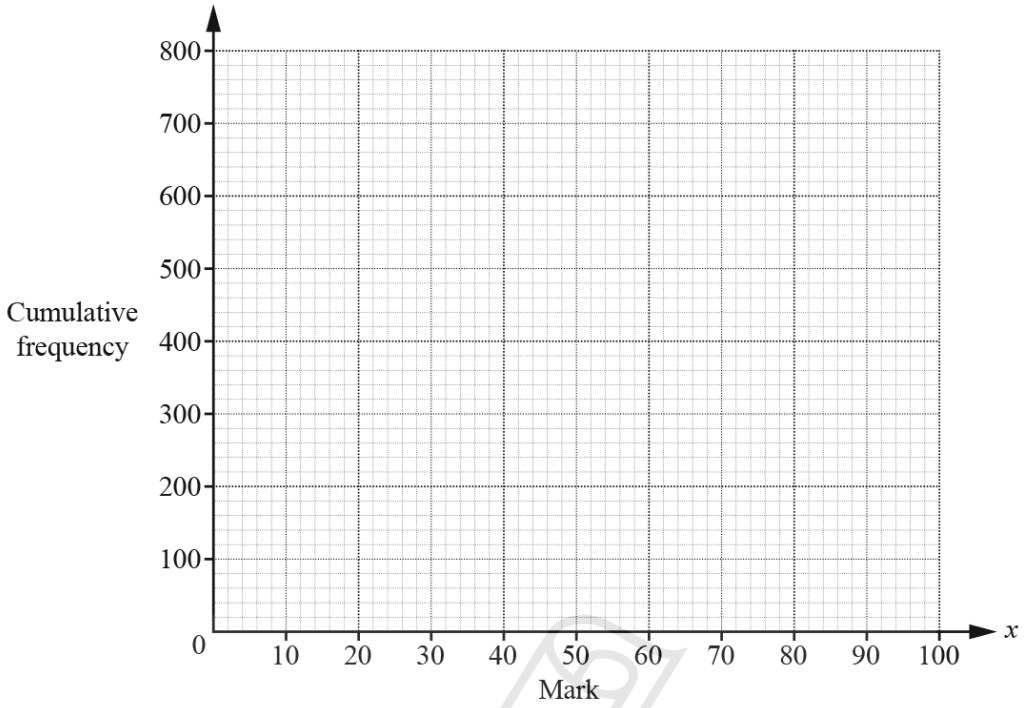
Answer(a) ..... [2]

(b) Complete the cumulative frequency table.

Mark (x)	Cumulative frequency
$0 < x \leqslant 20$	62
$0 < x \leqslant 30$	
$0 < x \leqslant 40$	
$0 < x \leqslant 50$	
$0 < x \leqslant 60$	
$0 < x \leqslant 80$	
$0 < x \leqslant 100$	800

[1]

(c) On the grid below, draw a cumulative frequency curve.



[3]

(d) Use your graph in **part (c)** to find estimates for

(i) the median mark,

Answer(d)(i) ..... [1]

(ii) the interquartile range,

Answer(d)(ii) ..... [2]

(iii) the minimum mark for a candidate to obtain a grade A, given that 15% of students gain a grade A.

Answer(d)(iii) ..... [3]

58. 0607_s21_qp_41 Q: 4

The marks, x, of 300 students in a chemistry test are shown in the table.

Mark (x)	Frequency
$0 < x \leqslant 10$	41
$10 < x \leqslant 20$	32
$20 < x \leqslant 30$	44
$30 < x \leqslant 40$	50
$40 < x \leqslant 60$	65
$60 < x \leqslant 80$	48
$80 < x \leqslant 100$	20

(a) Calculate an estimate of the mean mark.

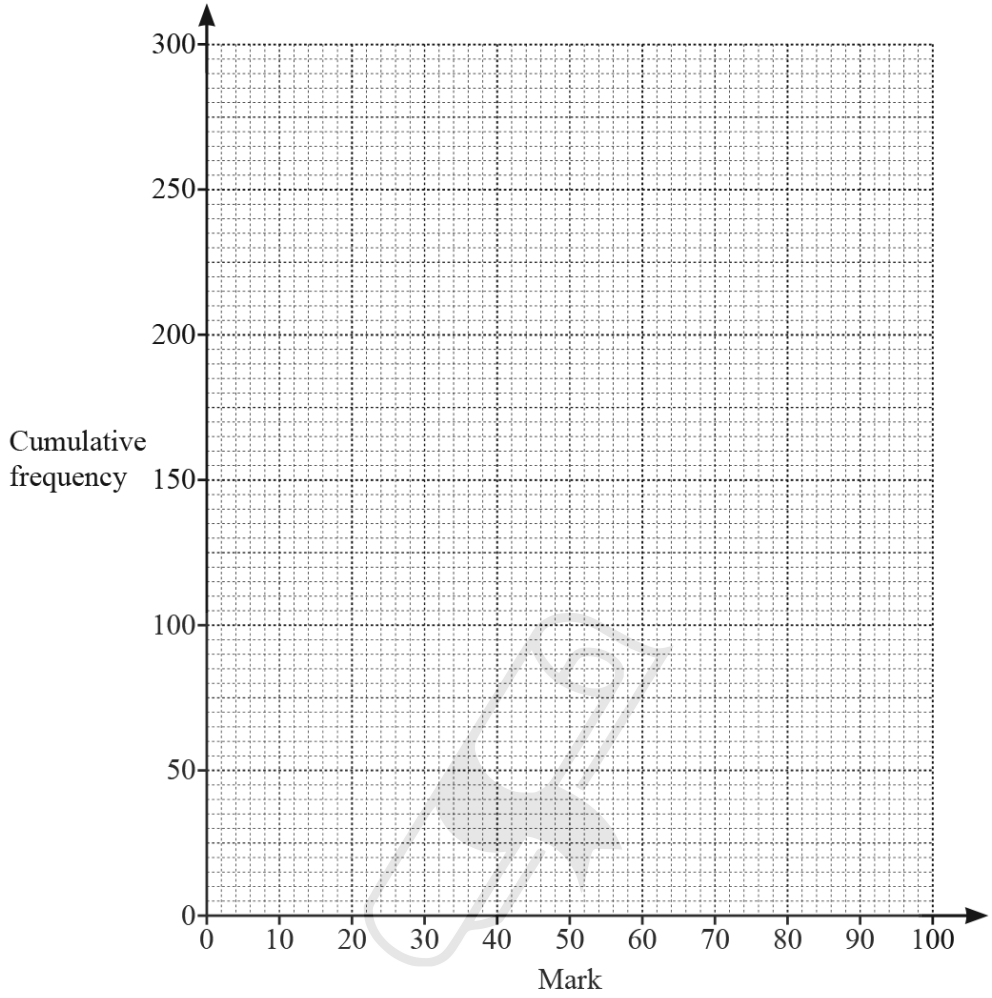
..... [2]

(b) Complete the cumulative frequency table.

Mark (x)	Cumulative frequency
$x \leqslant 10$	41
$x \leqslant 20$	
$x \leqslant 30$	
$x \leqslant 40$	
$x \leqslant 60$	
$x \leqslant 80$	
$x \leqslant 100$	300

[1]

(c) On the grid, draw a cumulative frequency curve.



[3]

(d) Use your curve in **part (c)** to find an estimate for

(i) the median mark,

..... [1]

(ii) the interquartile range.

..... [2]

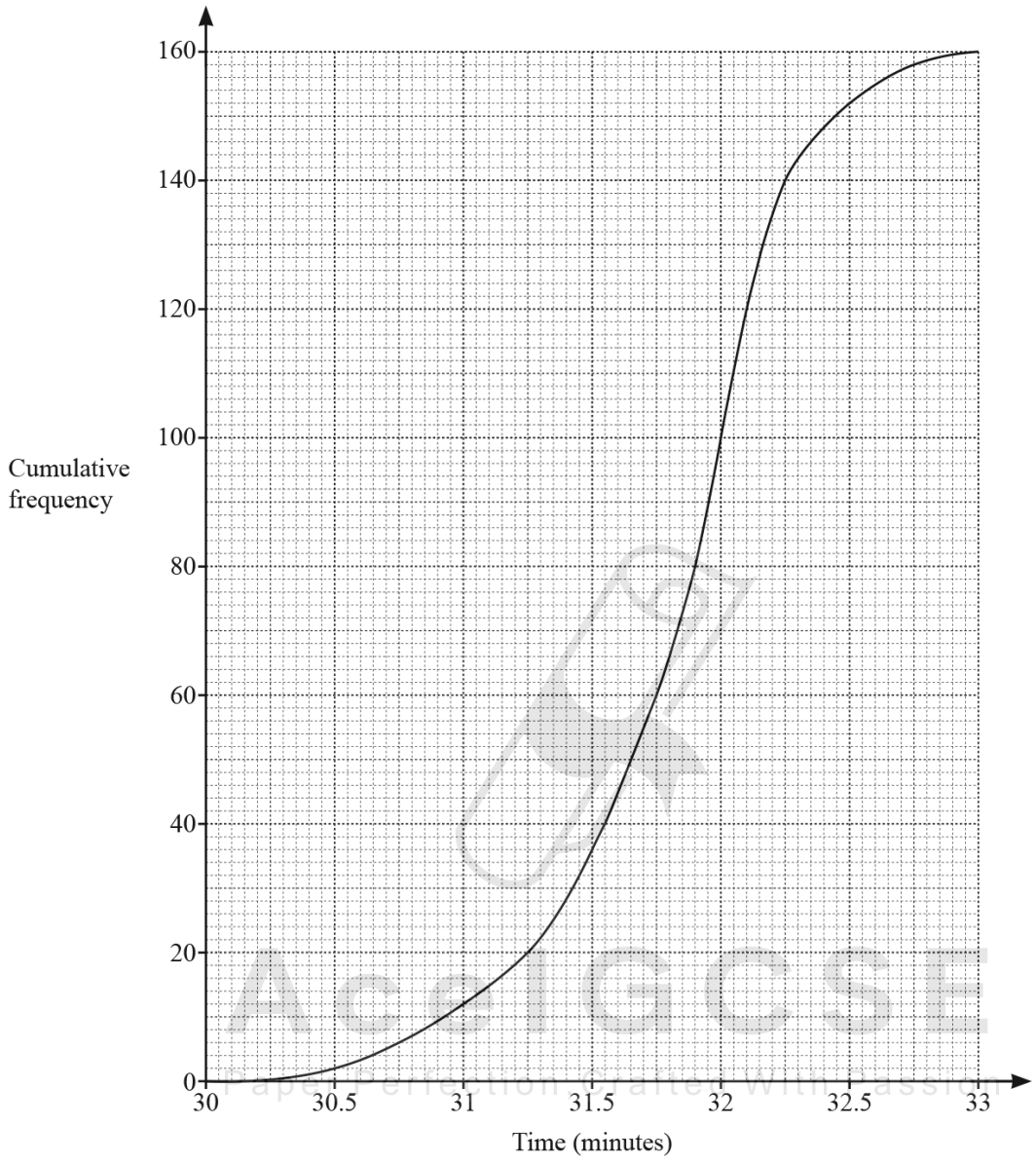
(e) 35% of the students pass the test.

Use your curve in **part (c)** to find an estimate of the minimum mark needed to pass.

..... [2]

59. 0607_s21_qp_42 Q: 6

The cumulative frequency curve shows the times, in minutes, for runner A in 160 races of 10 000 m.



(a) Use the curve to estimate

(i) the median time for runner A,

..... min [1]

(ii) the interquartile range for runner A,

..... min [2]

(iii) the 80th percentile for runner A.

..... min [2]

(b) In the same 160 races, runner B has a median time of 31.7 minutes and an interquartile range of 1 minute.
One of the runners is to be selected for a team.

(i) Give one reason why it may be better to select runner B.

..... [1]

(ii) Give one reason why it may be better to select runner A.

..... [1]

60. 0607_w16_qp_43 Q: 7

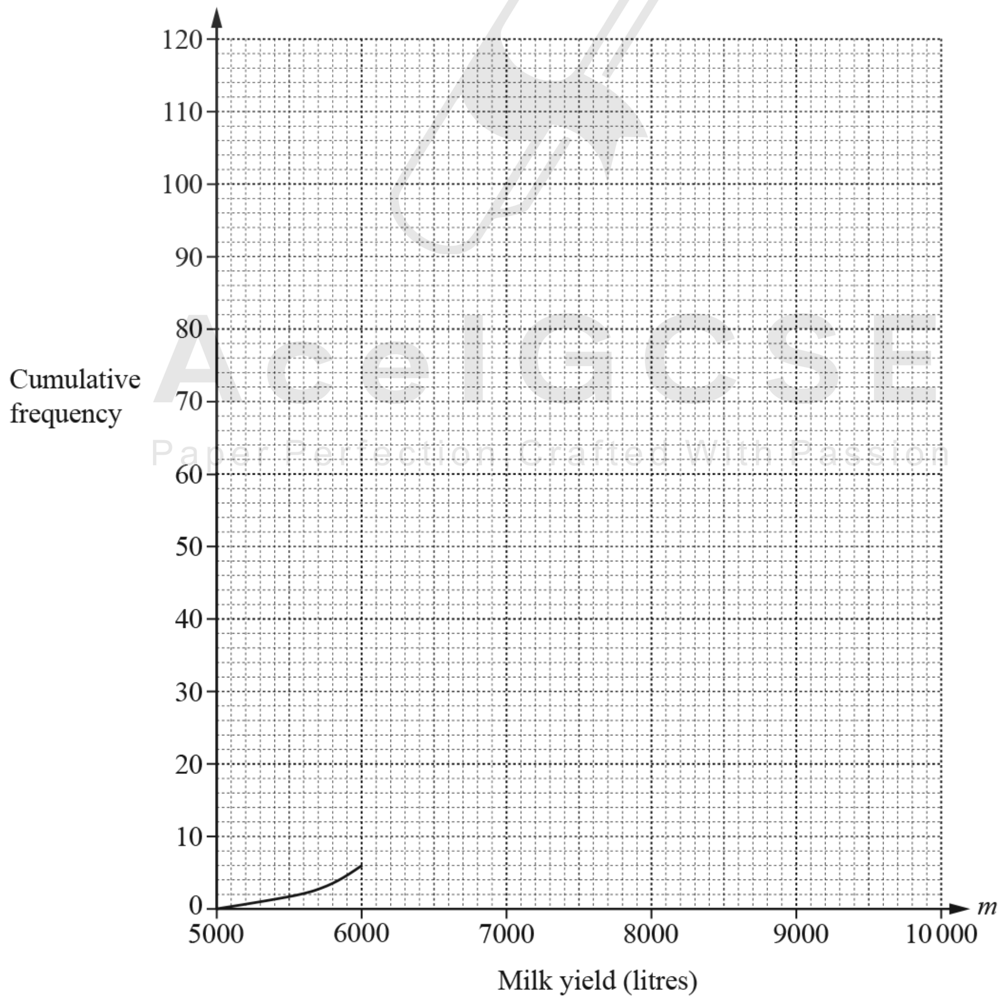
A farmer measured the milk yield of each of his 120 cows over a one-year period.
The results are shown in the frequency table.

Milk yield (m litres)	Frequency
$5000 < m \leqslant 6000$	6
$6000 < m \leqslant 6500$	12
$6500 < m \leqslant 7000$	22
$7000 < m \leqslant 7500$	37
$7500 < m \leqslant 8000$	20
$8000 < m \leqslant 9000$	17
$9000 < m \leqslant 10\,000$	6

Milk yield (m litres)	Cumulative frequency
$m \leqslant 6000$	6
$m \leqslant 6500$	
$m \leqslant 7000$	
$m \leqslant 7500$	
$m \leqslant 8000$	
$m \leqslant 9000$	
$m \leqslant 10\,000$	120

(a) **(i)** Complete the cumulative frequency table. [1]

(ii) Complete the cumulative frequency curve.



[3]

(iii) Use your graph to estimate the median.

..... litres [1]

(iv) Use your graph to estimate the inter-quartile range.

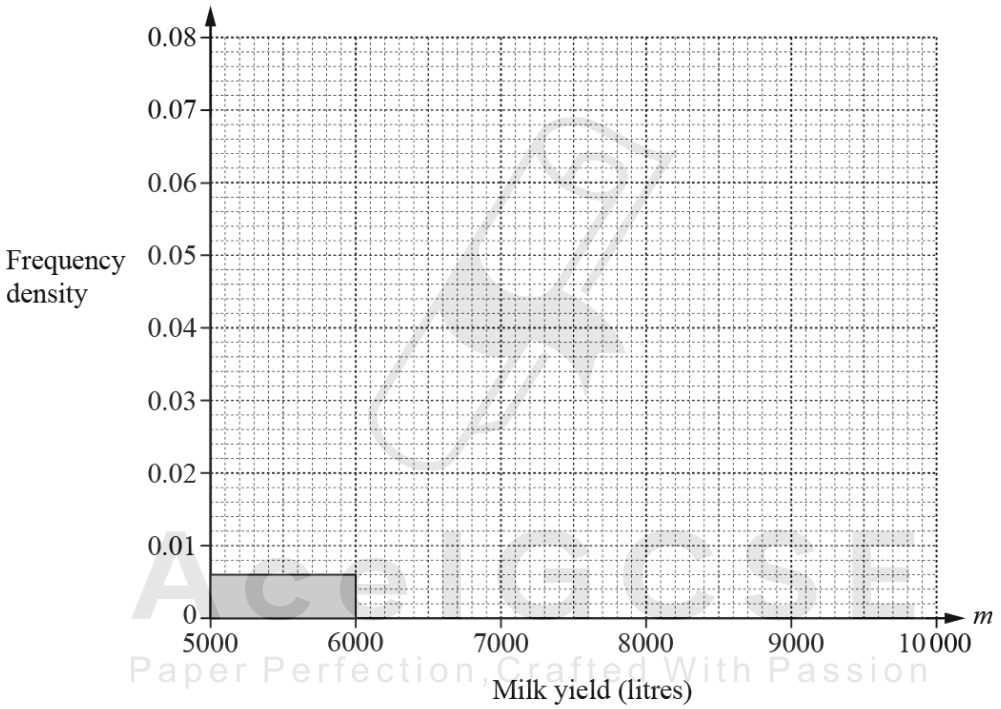
..... litres [2]

(v) The farmer sells the cows with a milk yield of less than 6200 litres.

Use your graph to estimate the number of cows he sells.

..... [1]

(b) On the grid below, complete the histogram to represent the data in the first table.



[4]

61. 0607_s21_qp_41 Q: 1

A stadium sells tickets at 10 different prices for a sporting event.
The table shows the number of tickets sold at each price.

Ticket price (x)	22	23	35	40	53	55	58	61	69	73
Number of tickets sold (y)	8600	9100	7000	7600	5200	6000	4800	4500	2600	3000

(a) What type of correlation is shown by the data?

..... [1]

(b) Find the mean of the 10 ticket prices.

$ ..... [1]

(c) **(i)** Find the equation of the regression line for y in terms of x.

$y =$ ..... [2]

(ii) The stadium decides to sell some tickets at a price of $45.

Use your answer to **part (i)** to estimate the number of tickets it will sell at this price.

..... [1]

62. 0607_s21_qp_43 Q: 6

(a) Ten students compare their test marks in Physics (x) and Chemistry (y).
The table shows the results.

Student	A	B	C	D	E	F	G	H	I	J
Physics (x)	50	48	31	80	65	85	27	30	45	53
Chemistry (y)	55	56	30	83	63	90	30	32	45	55

(i) Write down the type of correlation between the Physics and Chemistry marks.

..... [1]

(ii) Find the equation of the line of regression, giving y in terms of x.

$y =$ ..... [2]

(iii) Student K scores 70 in the Physics test.

Use your answer to **part (a)(ii)** to estimate this student's mark in Chemistry.

..... [1]

(b) The stem-and-leaf diagram shows information about the speeds of cars passing a school.

4	2 2 3 4 5 8
5	1 3 3 4 4 5 7 9
6	0 0 1 1 2 5

Key : 4 | 5 = 45 km/h

Find

(i) the range,

..... km/h [1]

(ii) the median,

..... km/h [1]

(iii) the lower quartile.

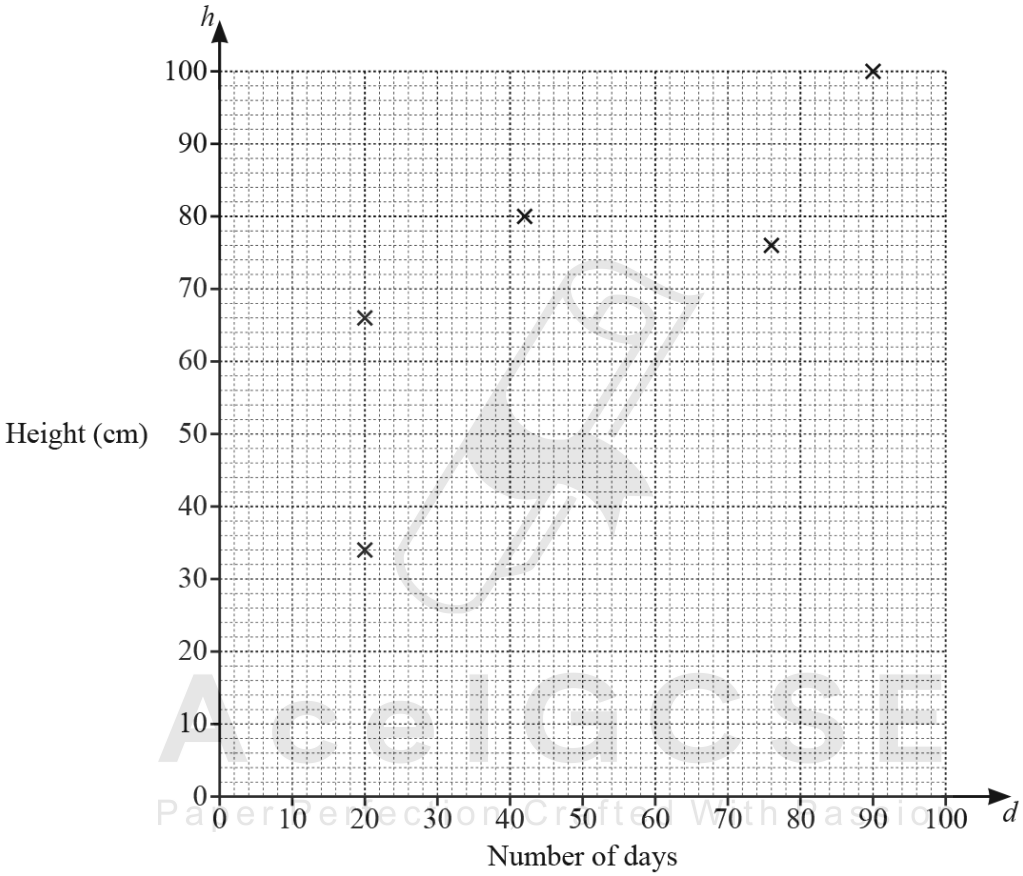
..... km/h [1]

63. 0607_w21_qp_41 Q: 3

The table shows the number of days, d, since planting and the heights, h cm, of some plants.

Number of days (d)	20	20	42	76	90	24	86	98	10	56
Height (h cm)	34	66	80	76	100	50	86	94	40	54

(a) Complete the scatter diagram.
The first five points have been plotted for you.



[2]

(b) What type of correlation is shown in the scatter diagram?

..... [1]

(c) Find the equation of the regression line for h in terms of d.

$h =$ ..... [2]

(d) Use your regression line to estimate the height of a plant that was planted 28 days ago.

..... cm [1]

(e) A plant was planted 140 days ago.

Explain why you should not use the equation of the regression line to estimate the height of this plant.

..... [1]

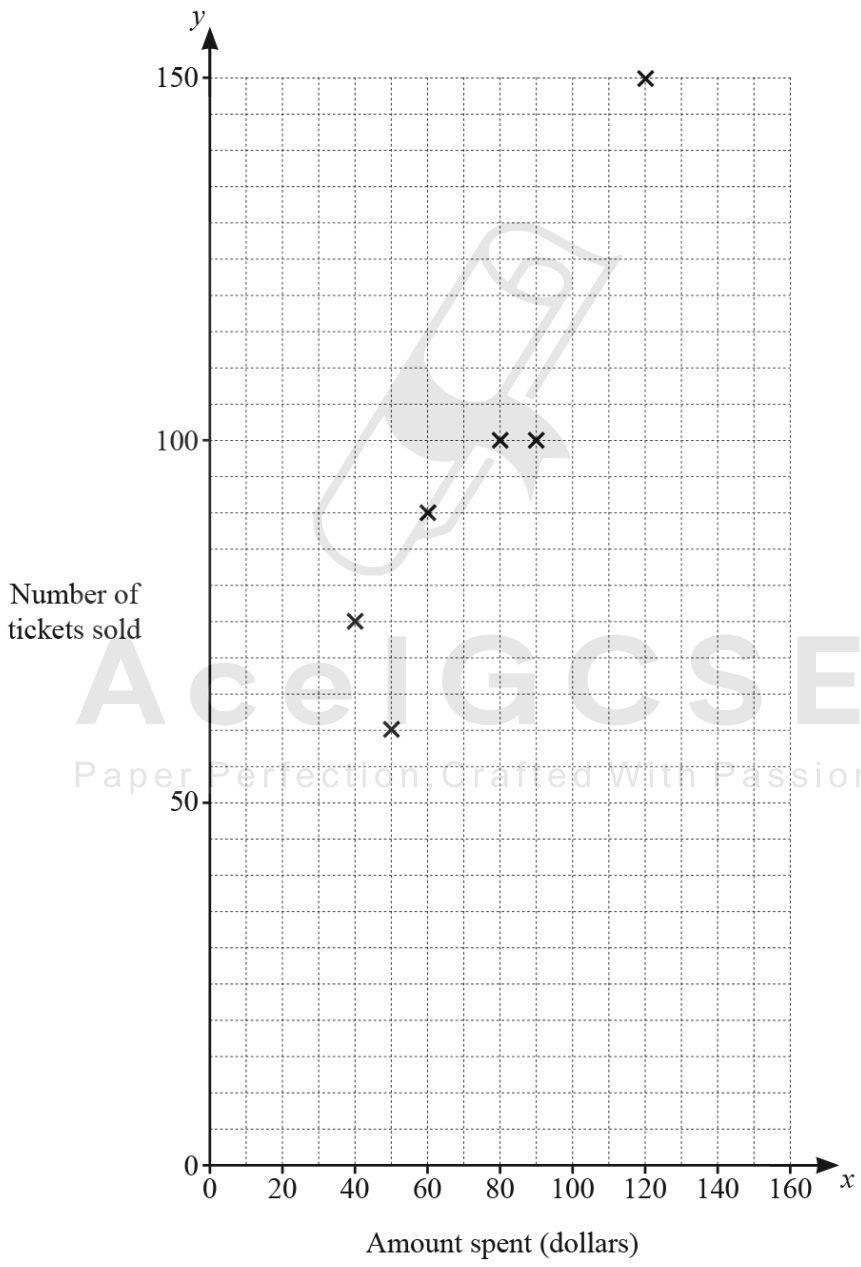
---

64. 0607_s20_qp_42 Q: 3

Petra is a singer.
She wants to estimate how much to spend on advertising.
The table shows the amount spent on advertising, $\$x$, and the number of tickets sold, y, for 10 performances.

Amount spent ($\$x$)	80	60	50	120	90	40	100	110	70	150
Number of tickets sold (y)	100	90	60	150	100	75	120	120	100	150

(a) (i) Complete the scatter diagram.
The first six points have been plotted for you.



[2]

(ii) What type of correlation is shown by the scatter diagram?

..... [1]

(b) Find the mean amount of money spent on advertising.

$ ..... [1]

(c) **(i)** Find the equation of the regression line for y in terms of x.

$y =$ ..... [2]

(ii) Use your regression line to estimate the number of tickets sold when Petra spends \$130 on advertising.

..... [1]

(iii) Explain why Petra should not rely on this regression line to estimate the number of tickets she will sell if she spends \$500 on advertising.

.....

..... [1]

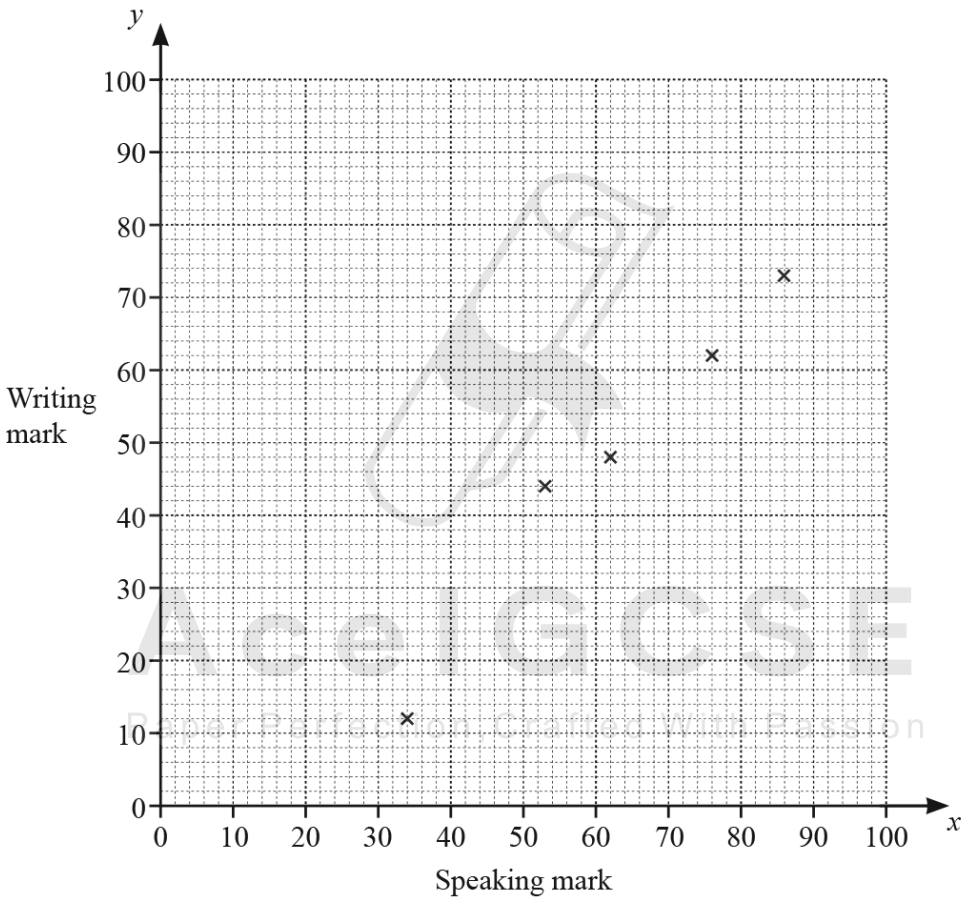
65. 0607_s20_qp_43 Q: 2

10 students take a language examination.
The examination consists of two parts, a speaking test and a writing test.
Both tests are marked out of 100.

The marks for the students in each of the tests is shown in the table.

Speaking mark (x)	86	62	53	34	76	95	30	70	88	72
Writing mark (y)	73	48	44	12	62	66	26	44	90	75

(a) Complete the scatter diagram to show these results.
The first five points have been plotted for you.



[2]

(b) What type of correlation is shown in your scatter diagram?

..... [1]

(c) **(i)** Calculate the equation of the regression line in the form $y = mx + c$.

$y =$ ..... [2]

(ii) Use this equation to estimate a mark in the writing test for a student who scored 48 in the speaking test.

..... [1]

66. 0607_w20_qp_41 Q: 1

Ten students at a school each study chemistry and physics.
Their marks in an examination in each subject are recorded.

Chemistry mark (x)	27	36	48	52	53	62	75	80	86	93
Physics mark (y)	45	68	36	55	62	73	66	81	94	80

(a) What type of correlation is there between the chemistry mark and the physics mark?

..... [1]

(b) Find

(i) the mean chemistry mark,

..... [1]

(ii) the mean physics mark.

..... [1]

(c) **(i)** Find the equation of the regression line for y in terms of x.

$y =$ ..... [2]

(ii) Another student scored 40 in the chemistry examination but was absent for the physics examination.

Estimate a physics mark for this student.

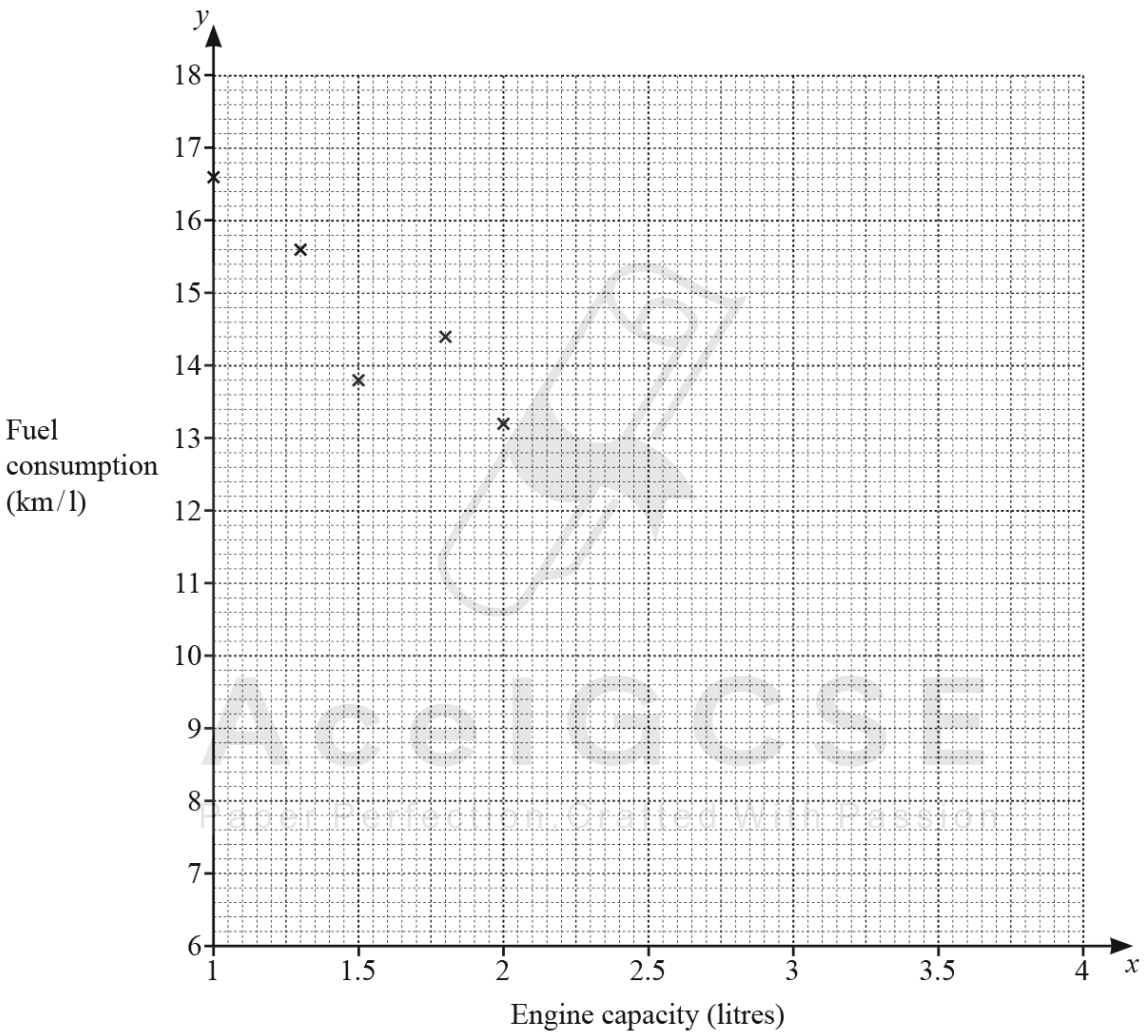
..... [1]

67. 0607_w20_qp_42 Q: 3

The table shows the engine capacity, x litres, and the fuel consumption, y kilometres per litre, for each of nine cars.

Engine capacity (x litres)	1	1.3	1.5	1.8	2	2.5	3	3.5	4
Fuel consumption (y km/l)	16.6	15.6	13.8	14.4	13.2	11.0	11.5	9.2	7.4

(a) Complete the scatter diagram. The first five points have been plotted for you.



[2]

(b) What type of correlation is shown in your scatter diagram?

..... [1]

(c) Find the equation of the regression line for y in terms of x.

$y =$ ..... [2]

(d) Use your answer to **part (c)** to estimate the fuel consumption for a car with engine capacity 2.8 litres.

..... km/l [1]

68. 0607_w20_qp_43 Q: 3

(a) Eva records her science homework marks during the school year.
The table shows the results.

Homework mark	5	6	7	8	9	10
Frequency	2	7	11	13	5	2

Find

(i) the range,

..... [1]

(ii) the mode,

..... [1]

(iii) the median,

..... [1]

(iv) the lower quartile,

..... [1]

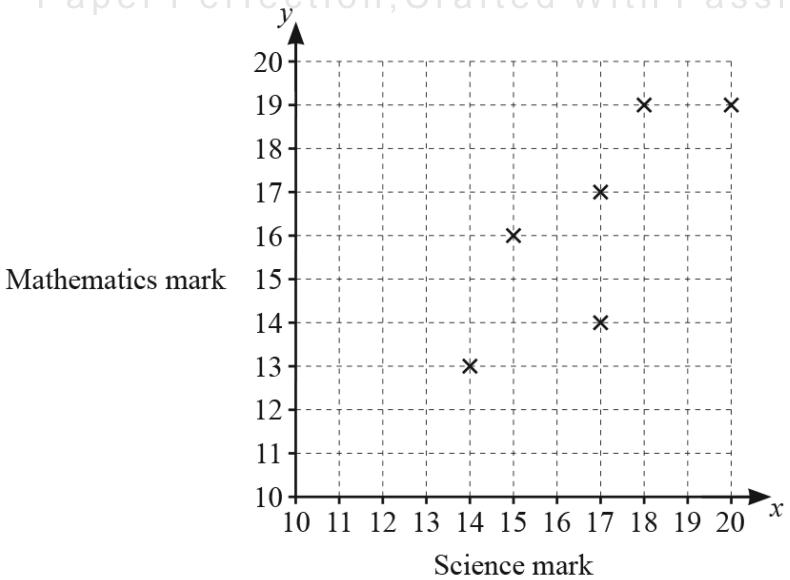
(v) the mean.

..... [2]

(b) Frank compares the science marks, x, with the mathematics marks, y, of ten students.
The table shows the results.

Science mark (x)	14	18	15	20	17	17	18	15	18	15
Mathematics mark (y)	13	19	16	19	17	14	17	15	15	12

(i) Complete the scatter diagram.
The first six points have been plotted for you.



[2]

(ii) What type of correlation is shown on the scatter diagram?

..... [1]

(iii) Find the equation of the line of regression, giving y in terms of x.

$y =$ ..... [2]

(iv) Another student's science mark is 16.
Use your answer to **part (b)(iii)** to find an expected mathematics mark for this student.

..... [1]

(c) Georgio records the time, t minutes, he takes to complete each of 40 pieces of mathematics homework.
The table shows his results.

Time (t minutes)	$0 < t \leqslant 10$	$10 < t \leqslant 15$	$15 < t \leqslant 20$	$20 < t \leqslant 40$
Frequency	9	20	6	5

Calculate an estimate of the mean.

..... min [2]

69. 0607_s19_qp_43 Q: 2

The table shows the marks of 10 students in a physics examination and a chemistry examination.

Physics mark (x)	17	29	34	46	57	66	73	84	92	96
Chemistry mark (y)	26	42	41	56	52	61	76	65	73	80

(a) Find

(i) the mean physics mark,

..... [1]

(ii) the mean chemistry mark.

..... [1]

(b) Find the equation of the regression line for y in terms of x.

$y =$ ..... [2]

(c) Use your regression line to estimate the chemistry mark when

(i) the physics mark is 60,

..... [1]

(ii) the physics mark is 5.

..... [1]

(d) Which physics mark, 60 or 5, is likely to give the most reliable chemistry mark?
Give a reason for your answer.

.....

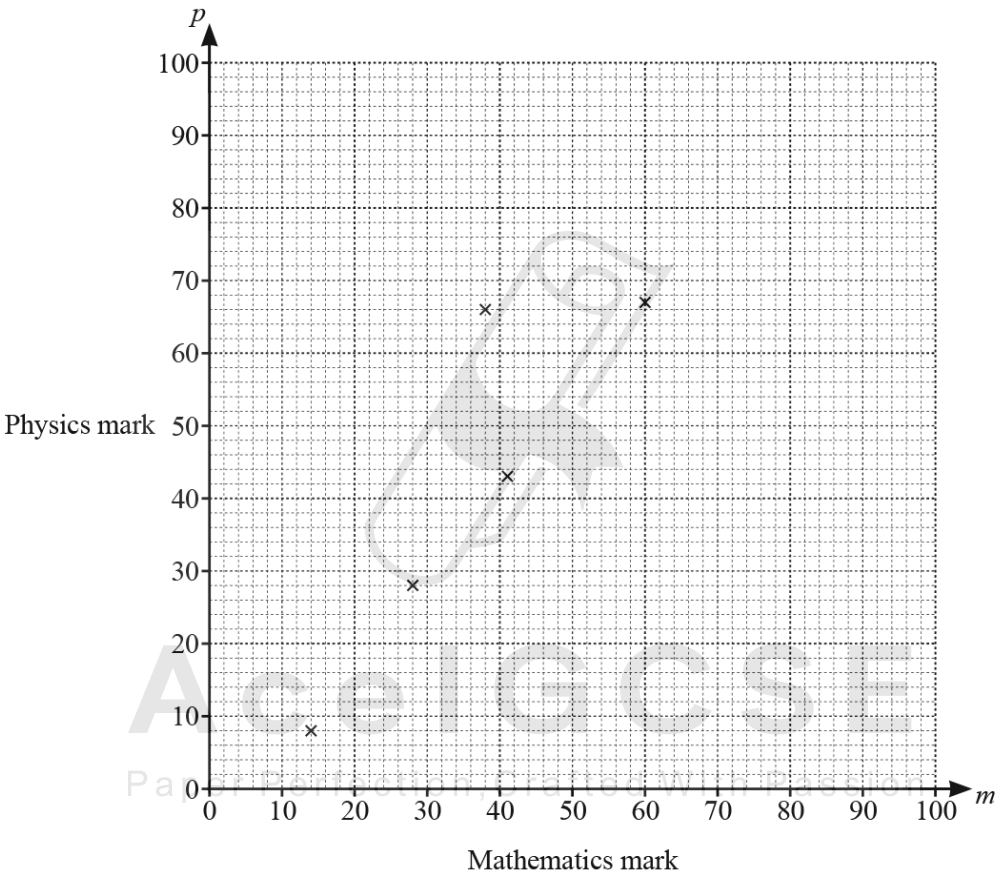
..... [1]

70. 0607_w19_qp_43 Q: 4

The table shows the mathematics mark and the physics mark for each of 10 students in an examination.

Mathematics mark (m)	14	28	38	41	60	66	76	82	90	98
Physics mark (p)	8	28	66	43	67	56	51	74	85	88

(a) Complete the scatter diagram.
The first five points have been plotted for you.



[2]

(b) Write down the type of correlation shown by the scatter diagram.

..... [1]

(c) Find the equation of the regression line.
Write the answer in the form $p = am + b$.

$p =$ ..... [2]

(d) A student was absent for the physics examination but gained 56 marks in the mathematics examination.

Use your answer to **part (c)** to estimate a physics mark for this student.

..... [1]

(e) The school decided that the physics examination was too difficult and added 5 marks to each of the physics marks.

Write down the new equation of the regression line.

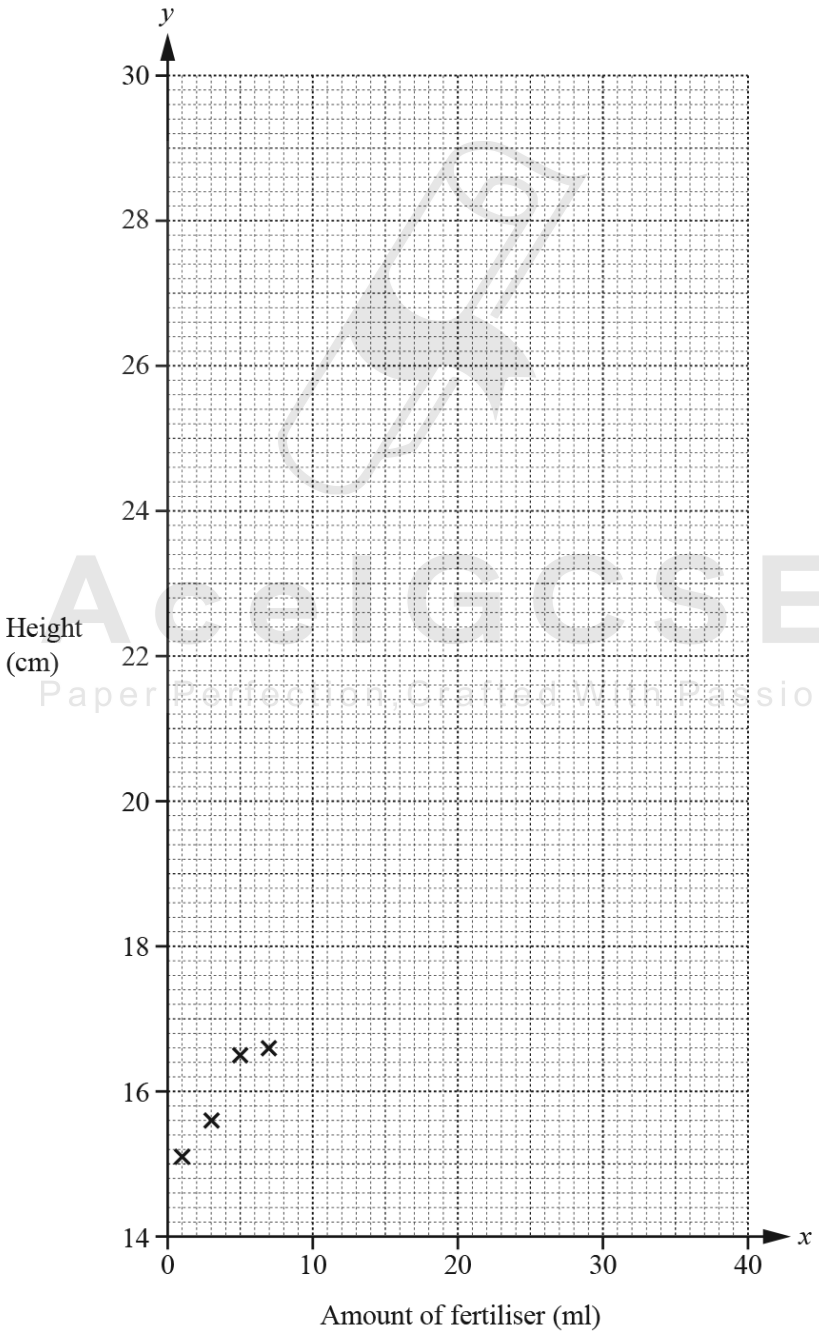
..... [1]

71. 0607_s18_qp_42 Q: 10

Wasim sprays different amounts of fertiliser on some seedlings.
He measures the amount, x millilitres, sprayed on each seedling.
A week later he measures the height, y centimetres, of each seedling.
His results are shown in the table.

Amount of fertiliser (x ml)	1	3	5	7	10	14	18	25	30	35	40
Height (y cm)	15.1	15.6	16.5	16.6	17	19.8	21	25.1	28.8	28.6	29.1

(a) (i) Complete the scatter diagram.
The first four points have been plotted for you.



[3]

(ii) What type of correlation is shown by the scatter diagram?

..... [1]

(b) Find

(i) the mean amount of fertiliser,

..... ml [1]

(ii) the mean height.

..... cm [1]

(c) **(i)** Find the equation of the regression line in the form $y = mx + c$.

$y =$ ..... [2]

(ii) Use your answer to **part (c)(i)** to estimate the height of a seedling when the amount of fertiliser is 20 ml.

..... cm [1]

(iii) Write down the units of m in the equation of the regression line, $y = mx + c$.

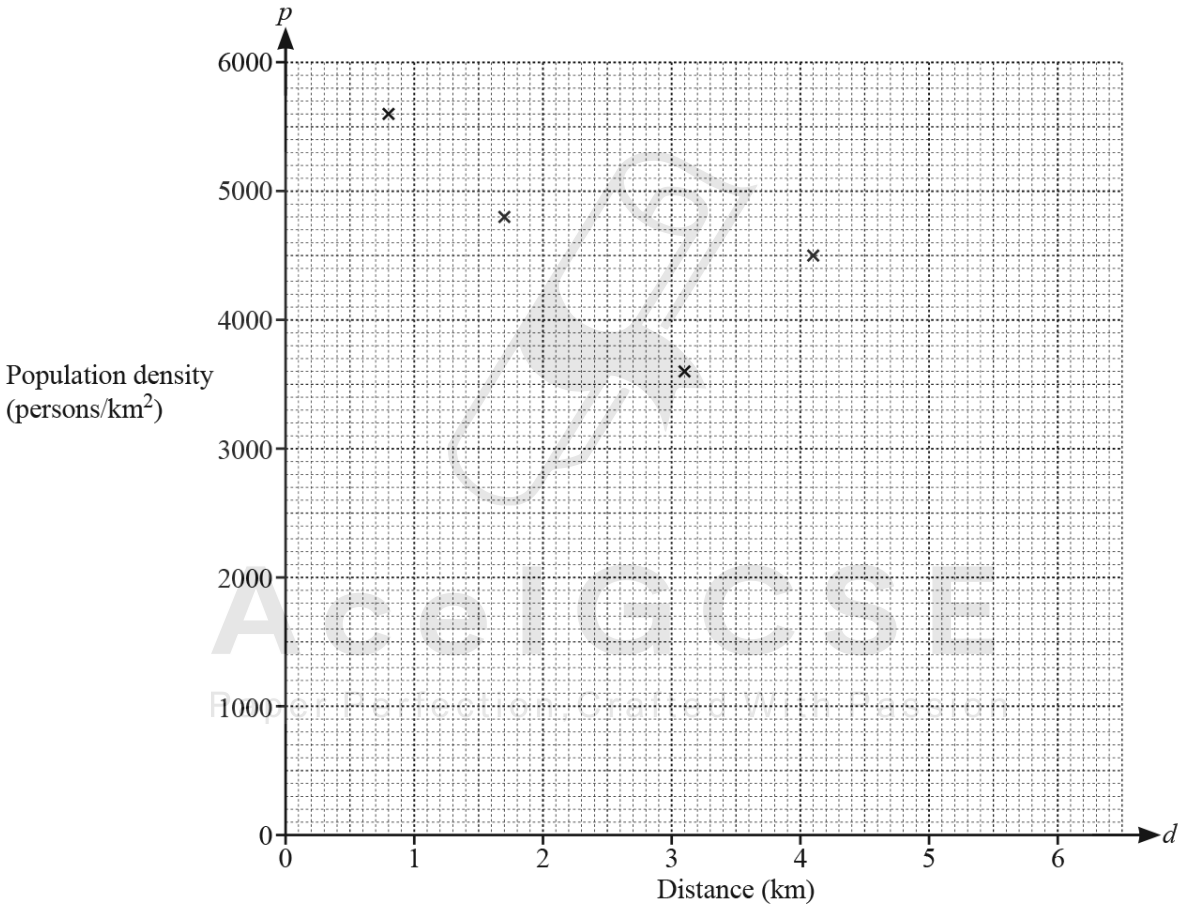
..... [1]

72. 0607_s18_qp_43 Q: 4

Hamid records the population density, p persons/km^2, in ten regions of the city in which he lives.
He also records the distance, $d$km, of each region from the city centre.
The results are shown in the table.

Region	A	B	C	D	E	F	G	H	I	J
Distance ($d$km)	0.8	1.7	3.1	4.1	3.5	2.8	4.6	3.7	1.9	5.1
Population density (p persons/km^2)	5600	4800	3600	4500	2800	3300	1100	2300	3900	800

(a) Complete the scatter diagram.
The first four points have been plotted for you.



[3]

(b) **(i)** What type of correlation is shown in your scatter diagram?

..... [1]

(ii) Which region fits this model of correlation **least** well?

Region ..... [1]

(c) **(i)** Calculate the equation of the regression line in the form $p = md + c$.

$p =$ ..... [2]

(ii) Use this equation to estimate the population density of a region 2.4 km from the city centre.

..... persons/km^2 [1]

(iii) Why would it not be sensible to use this equation to estimate the population density of a region 6.3 km from the city centre?

..... [1]

---

73. 0607_w18_qp_43 Q: 5

The table shows the scores of 10 students in a mathematics test and in a physics test.

Student	A	B	C	D	E	F	G	H	I	J
Mathematics (x)	4	6	6	8	9	9	9	10	10	10
Physics (y)	5	5	6	9	9	8	7	9	10	7

(a) Find the median and the upper quartile of the physics scores.

median = ...

upper quartile = ... [2]

(b) Write down the type of correlation between the mathematics scores and the physics scores.

..... [1]

(c) Find the equation of the line of regression in the form $y = mx + c$.

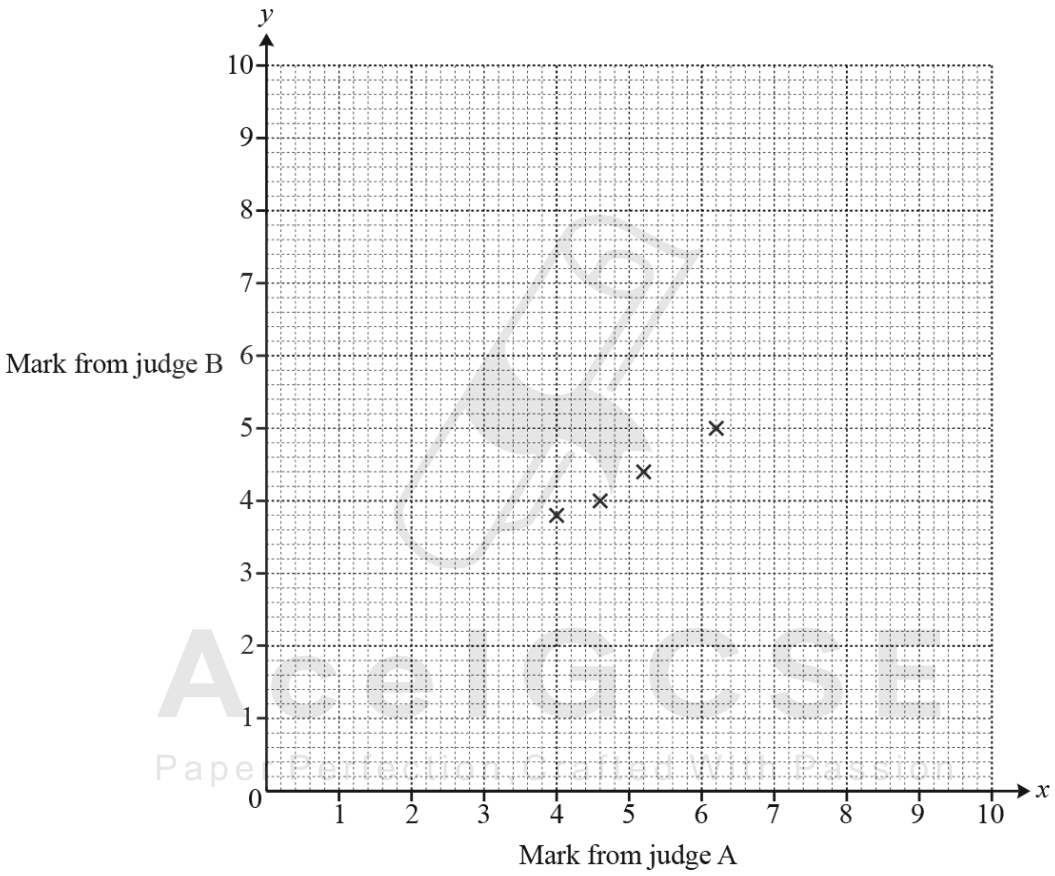
$y =$ ..... [2]

---

74. 0607_s17_qp_42 Q: 3
Two judges each give a mark out of ten for each dancer in a competition.
Their marks for ten dancers are shown in the table.

Mark from judge A (x)	4.0	4.6	5.2	6.2	8.8	6.8	7.0	7.4	8.0	8.6
Mark from judge B (y)	3.8	4.0	4.4	5.0	7.6	5.2	5.6	6.8	6.6	7.0

(a) Complete the scatter diagram.
The first four points have been plotted for you.



[3]

(b) What type of correlation is shown on your scatter diagram?

..... [1]

(c) **(i)** Find the equation of the regression line, in the form $y = mx + c$.

$y =$ ..... [2]

(ii) Judge A gives another dancer a mark of 6.4 .

Use your equation to estimate the mark judge B gives this dancer.

..... [1]

75. 0607_s17_qp_43 Q: 3

(a) 12 students take part in a quiz.
The table shows the number of correct answers given by each student.

Student	A	B	C	D	E	F	G	H	I	J	K	L
Number of correct answers	7	6	9	5	6	4	7	8	4	10	9	3

Find

(i) the median,

..... [1]

(ii) the lower quartile,

..... [1]

(iii) the number of students with a smaller number of correct answers than the lower quartile.

..... [1]

(b) The table shows the average monthly temperature and the average monthly rainfall in Maseru, Lesotho.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature (t °C)	21	21	19	15	11	8	8	11	15	17	19	21
Rainfall (r mm)	113	102	99	59	28	12	12	14	27	62	83	88

(i) What type of correlation is there between the monthly temperature and the monthly rainfall?

..... [1]

(ii) Find the range of these temperatures.

..... °C [1]

(iii) Find the mean of these temperatures.

..... °C [1]

(iv) Find the equation of the line of regression, giving r in terms of t.

$r =$ ..... [2]

(v) On the diagram, sketch the graph of the regression line for $8 \leqslant t \leqslant 21$.

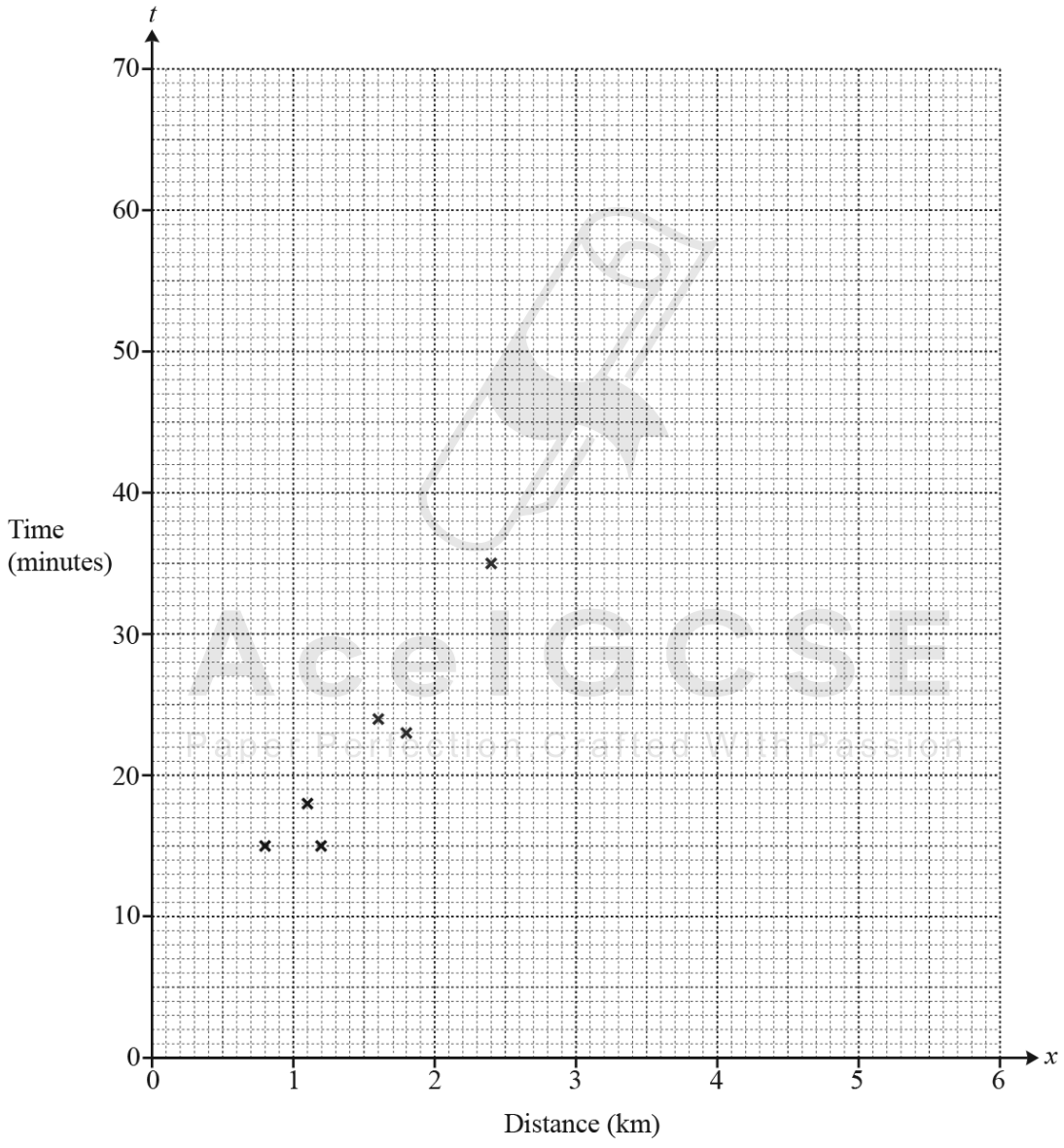
[2]

76. 0607_w17_qp_41 Q: 4

The table shows the distance that each of 12 students lives from school and the time they each take to get to school.

Distance (x km)	0.8	1.1	1.2	1.6	1.8	2.4	2.8	3.1	3.5	4.2	4.7	5.1
Time (t minutes)	15	18	15	24	23	35	37	35	45	48	52	63

(a) Complete the scatter diagram.
The first six points have been plotted for you.



[2]

(b) What type of correlation is shown by the scatter diagram?

..... [1]

(c) **(i)** Find the equation of the regression line in the form $t = mx + c$.

$t =$ ..... [2]

(ii) Use your answer to **part (c)(i)** to estimate the time taken to get to school for a student who lives 2.2 km from school.

.....min [1]

(iii) Why would it not be sensible to use your answer to **part (c)(i)** to estimate the time taken to get to school for a student who lives 10 km from school?

.....

..... [1]

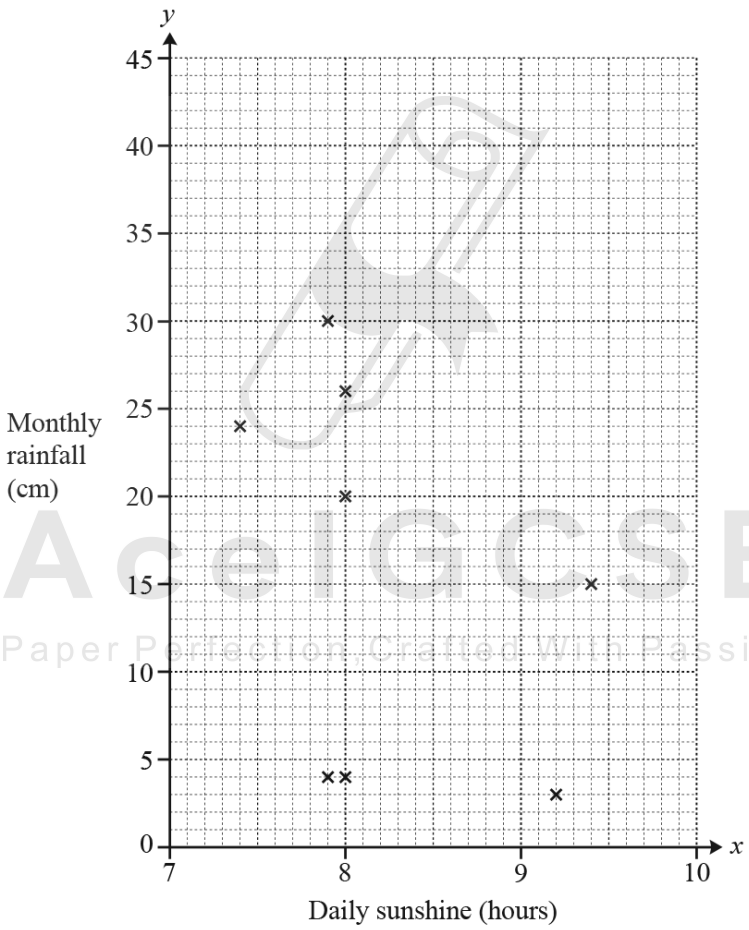
77. 0607_w17_qp_43 Q: 3

Pepe wants to find out if there is a correlation between the hours of sunshine, x hours, and the rainfall, y cm, in Phuket.

Pepe recorded the following results.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily sunshine (x hours)	8	9.2	7.9	9.4	8	7.4	7.9	8	7.3	7.4	7.5	8
Monthly rainfall (y cm)	4	3	4	15	20	24	30	26	40	28	20	6

(a) **(i)** Complete the scatter diagram.
The first eight points have been plotted for you.



[2]

(ii) What type of correlation is shown by the scatter diagram?

..... [1]

(b) **(i)** Find the mean number of hours of sunshine.

..... hours [1]

(ii) Find the mean rainfall.

..... cm [1]

(c) **(i)** Find the equation of the regression line for y in terms of x.

$y =$ ..... [2]

(ii) Estimate the rainfall when the number of hours of sunshine is 7.7 .

..... cm [1]

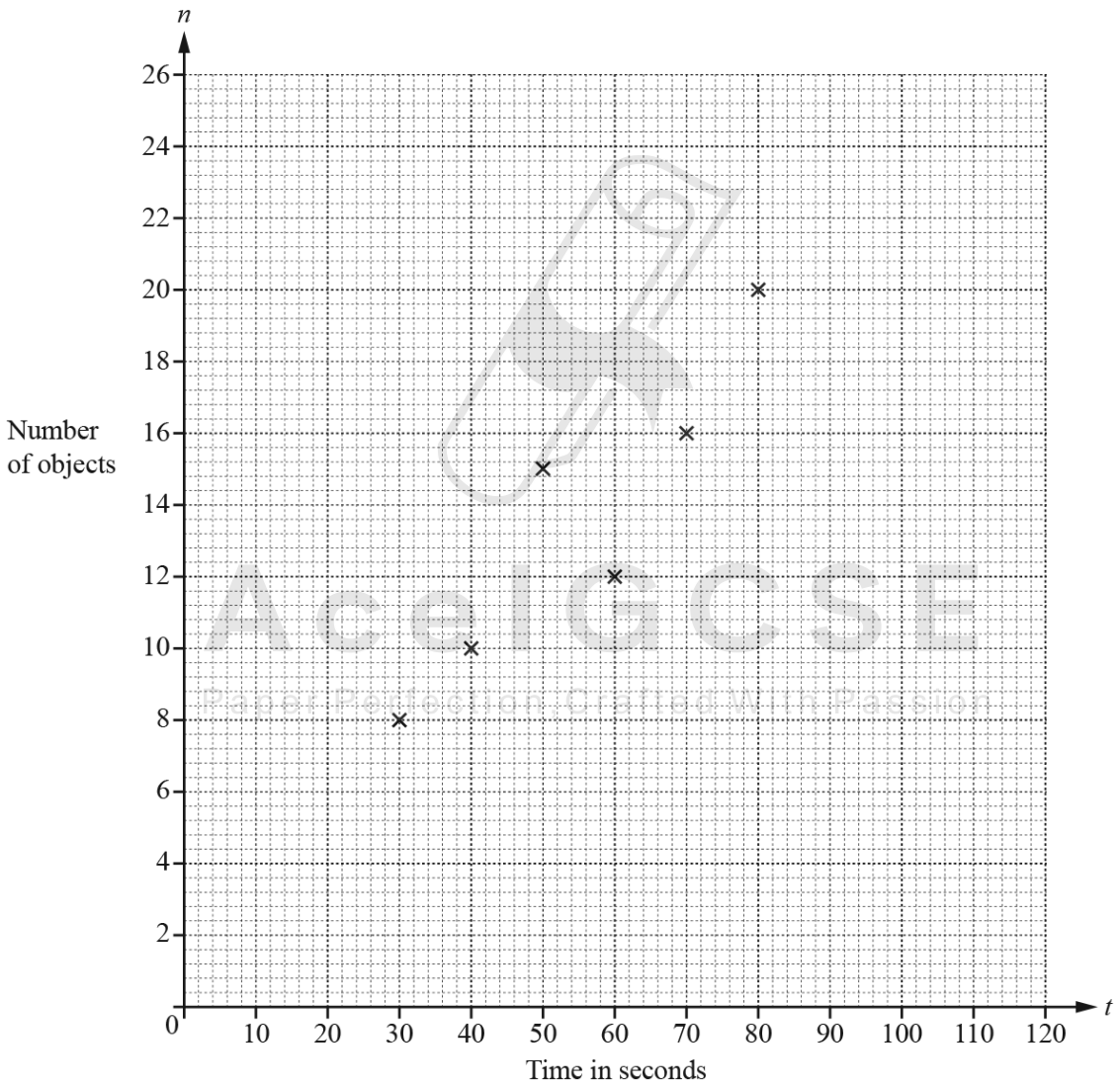
78. 0607_s16_qp_41 Q: 5

In Kim's game a player looks at a fixed number of objects on a tray for a length of time, t seconds. The player is then tested to find how many objects they remember.

The table shows the results for 10 players.

Time in seconds (t)	30	40	50	60	70	80	90	100	110	120
Number of objects (n)	8	10	15	12	16	20	18	23	19	25

(a) Complete the scatter diagram.
The first six points have been plotted for you.



[2]

(b) What type of correlation is shown by the scatter diagram?

..... [1]

(c) **(i)** Calculate the mean time.

.....s [1]

(ii) Calculate the mean number of objects.

..... [1]

(d) **(i)** Find the equation of the regression line.
Give your answer in the form $n = mt + c$.

$n =$ ..... [2]

(ii) Errol looks at the tray for 85 seconds.

Use your equation to estimate the number of objects he remembers.

..... [1]

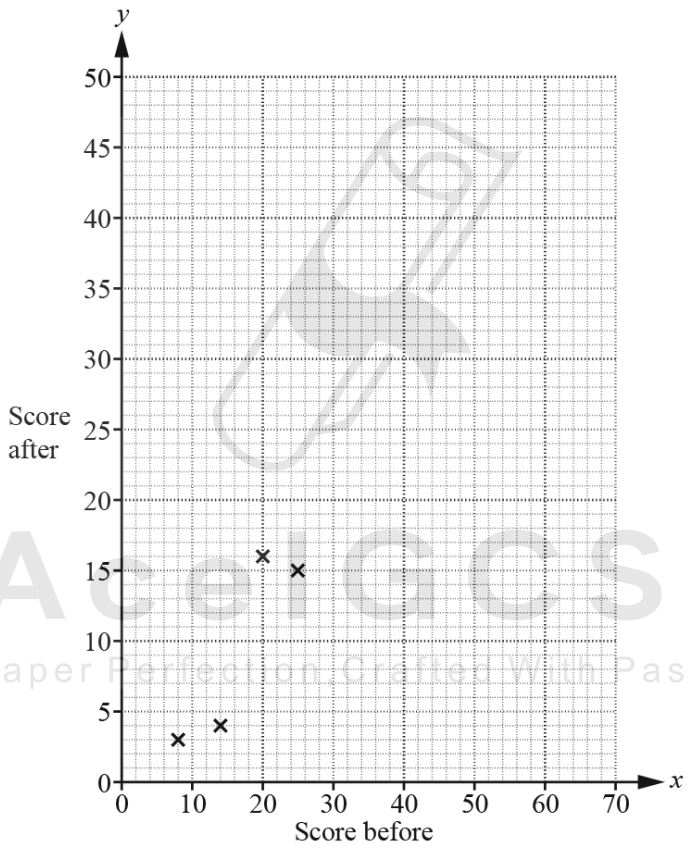
79. 0607_s16_qp_43 Q: 10

A company is testing a new drug.
Ten patients were examined and given a score before and after taking the drug.
A decrease in score represents an improvement.

The results are shown in the table.

Patient	A	B	C	D	E	F	G	H	I	J
Score before (x)	8	14	20	25	32	34	41	42	50	61
Score after (y)	3	4	16	15	20	27	34	28	40	49

(a) **(i)** Complete the scatter diagram.
The first four points have been plotted for you.



[3]

(ii) What type of correlation is shown by the scatter diagram?

..... [1]

(b) Find

(i) the mean score before taking the drug,

.... [1]

(ii) the mean score after taking the drug.

.... [1]

(c) **(i)** Find the equation of the regression line for y in terms of x.

$y =$ .... [2]

(ii) Estimate the score after taking the drug when the score before taking the drug was 30.

.... [1]

(iii) A patient has a score before taking the drug of 80.

Explain why using the line of regression is unlikely to be reliable in predicting the score of the patient after taking the drug.

....

.... [1]

80. 0607_w16_qp_42 Q: 3

Ten students at a school each recorded the number of hours they spent revising before an examination. The school compared the number of hours spent revising and the examination mark.

Number of hours spent revising (x)	3	4	8	9	10	12	13.5	17	21	24
Examination mark (y)	45	36	68	55	62	66	73	81	80	94

(a) What type of correlation is there between the number of hours spent revising and the examination mark?

..... [1]

(b) Find

(i) the mean number of hours spent revising,

..... [1]

(ii) the mean examination mark.

..... [1]

(c) **(i)** Find the equation of the regression line for y in terms of x.

$y =$ ..... [2]

(ii) Estimate the examination mark for a student who spent 19 hours revising.

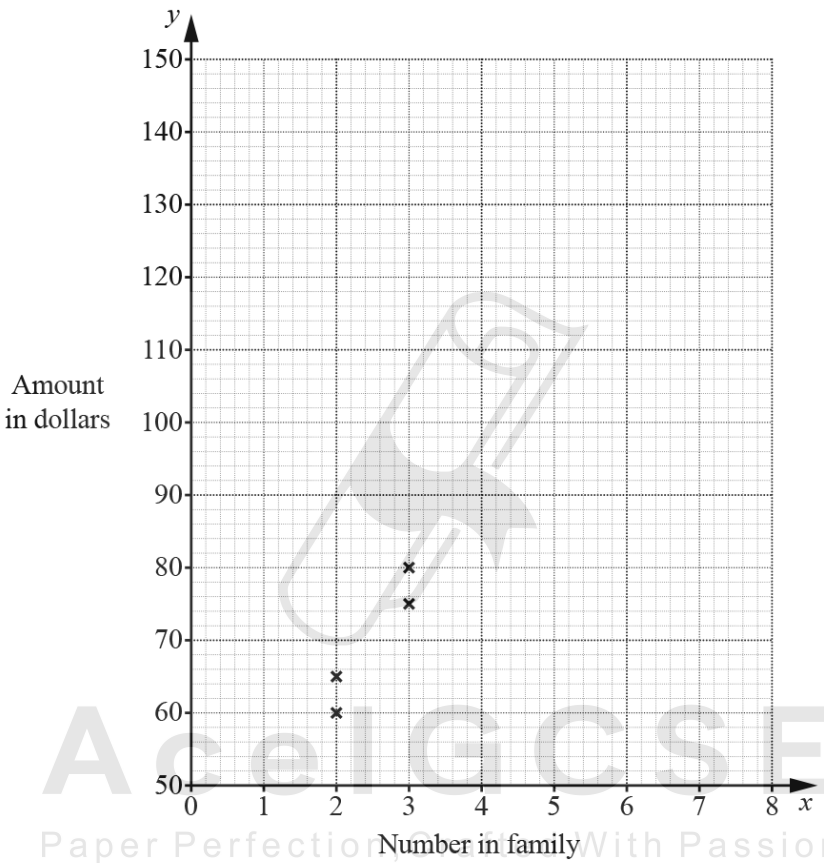
..... [1]

81. 0607_s15_qp_41 Q: 9

The table shows the amount in dollars, y, that 10 families of different size, x, spend in one week.

Number in family, (x)	2	2	3	3	5	5	6	6	6	6
Amount in dollars, (y).	60	65	80	75	100	105	120	135	125	115

(a) (i) Complete the scatter diagram.
The first four points have been plotted for you.



[2]

(ii) What type of correlation is shown by the scatter diagram?

Answer(a)(ii) ..... [1]

(b) Find

(i) the mean family size,

Answer(b)(i) ..... [1]

(ii) the mean amount spent in one week.

Answer(b)(ii) $ ..... [1]

(c) **(i)** Find the equation of the regression line in the form $y = mx + c$.

Answer(c)(i) $y =$ ..... [2]

(ii) Use your answer to **part (c)(i)** to estimate the amount spent in one week by a family of 4.

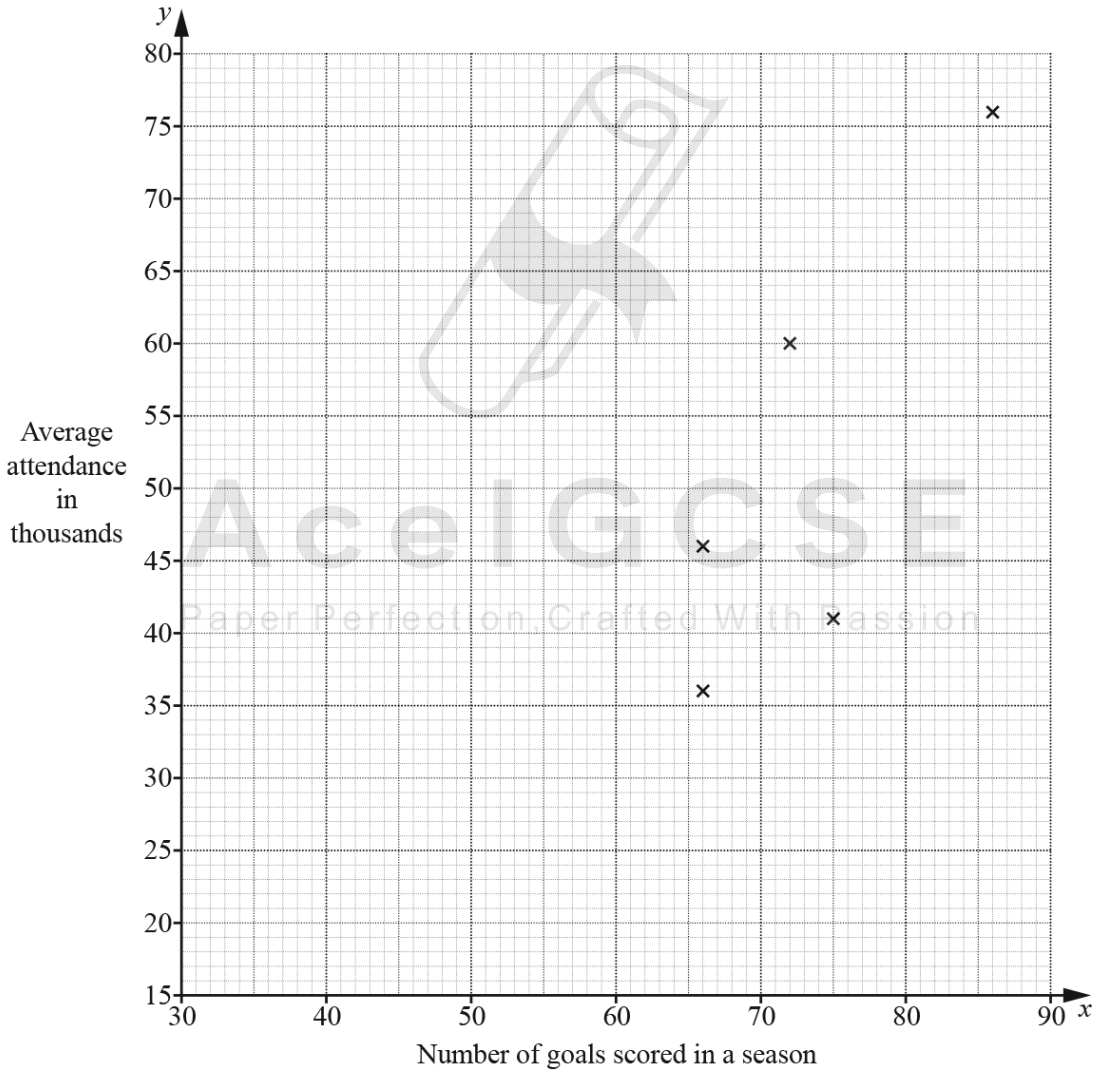
Answer(c)(ii) $ ..... [1]

82. 0607_s15_qp_42 Q: 5

The table shows the number of goals scored in a season, x, and the average attendance at matches in thousands, y, for ten teams in a league.

Team	A	B	C	D	E	F	G	H	I	J
Number of goals scored in a season (x)	86	66	75	72	66	55	71	53	47	45
Average attendance in thousands (y)	76	46	41	60	36	36	45	25	20	35

(a) Complete the scatter diagram.
The first five points have been plotted for you.



[2]

(b) What type of correlation is shown by the scatter diagram?

Answer(b) ..... [1]

(c) Find the mean

(i) number of goals scored,

Answer(c)(i) ..... [1]

(ii) average attendance.

Answer(c)(ii) .....thousand [1]

(d) Find the equation of the line of regression in the form $y = mx + c$.

Answer(d) $y =$ ..... [2]

(e) Use your answer to **part (d)** to estimate the average attendance for a team that scored 80 goals in a season.

Answer(e) ..... [1]

83. 0607_w15_qp_42 Q: 3

The table gives the marks of 10 students in a geography exam and a history exam.

Geography mark (x)	12	23	36	41	57	62	78	81	89	93
History mark (y)	32	43	41	51	52	60	68	65	76	80

(a) Find

(i) the mean geography mark,

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

(ii) the mean history mark.

Answer(*a*)(ii) ..... [1]

(b) **(i)** Find the equation of the regression line for y in terms of x.

Answer(*b*)(i) $y =$ ..... [2]

(ii) Estimate the history mark when the geography mark is 51.

Answer(*b*)(ii) ..... [1]

84. 0607_w15_qp_43 Q: 3

(a) The speeds, v km/h, of 120 cars passing under a bridge are measured.
The table shows the results.

Speed (v km/h)	$30 < v \leqslant 50$	$50 < v \leqslant 60$	$60 < v \leqslant 70$	$70 < v \leqslant 75$	$75 < v \leqslant 90$
Frequency	2	25	46	41	6

(i) Write down the interval that contains the lower quartile.

Answer(a)(i) ..... [1]

(ii) Calculate an estimate of the mean.

Answer(a)(ii) ..... km/h [2]

(iii) Complete the table of frequency densities.

Speed (v km/h)	$30 < v \leqslant 50$	$50 < v \leqslant 60$	$60 < v \leqslant 70$	$70 < v \leqslant 75$	$75 < v \leqslant 90$
Frequency density					

[3]

(b) The table below shows the monthly rainfall and the average midday temperatures of a city.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (r mm)	15	20	20	35	70	90	75	70	50	30	12	8
Temperature (t° C)	35	25	22	15	10	10	15	20	27	30	38	36

Find the equation of the line of regression, giving t in terms of r.

Answer(b) $t =$ ..... [2]

01. 0607_m24_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)	4 points plotted correctly	2	**B1** for 2 correct.
(b)	Negative	1	
(c)	$y = -0.325x + 10.6$	2	0.3245... , 10.57... **B1** for $y = -0.325x + k$ or $y = kx + 10.6$
(d)	7.06 to 7.09	1	**FT** *their* (c)
(e)	Too far outside range of data oe	1	

02. 0607_m24_ms_42 Q: 8

Question	Answer	Marks	Partial Marks
(a)	Correct graph through 7 points	4	**B3** for graph through 5 correct points or **B2** for graph through 3 correct points or for all correct heights translated to other point in interval or for correct points plotted not joined or **B1** for 6, 22, 46, 82, 102, 116, 120
(b)(i)	2100 to 2300	1	**FT** from increasing curve.
(b)(ii)	950 to 1150	2	**B1** for $1650 \leqslant [LQ] \leqslant 1750$ or $2600 \leqslant [UQ] < 2750$
(c)	68.3 to 71.7	3	**B1FT** for 34 to 38 **M1** for $\frac{their(34\text{ to }38)}{120}[\times 100]$ or $\frac{120 - their(34\text{ to }38)}{120}[\times 100]$

03. 0607_s24_ms_41 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	47.4 or 47.375	2	**M1** for at least 4 correct mid-points soi
(a)(ii)(a)	[7], 20, 40, 72, [100]	1	
In parts **(a)(ii)(b)** and **(a)(ii)(c)**, marks can only be earned with an increasing curve			
(a)(ii)(b)	Correct curve (20, 7), (35, 20), (40, 40), (60, 72), (80, 100)	3	**B1** for horizontal plot correct **B1FT** for at least 4 vertical plots correct
(a)(ii)(c)	24 to 28	2	**M1FT** for [UQ =] 61 to 63 or [LQ =] 35 to 37
(b)	44	3	**M2** for $10 \times 25 + \frac{(20+k)}{2} \times 15 + \frac{(k+80)}{2} \times 10 \quad [= 27 \times 50]$ oe or **M1** for $\frac{(20+k)}{2}$ or $\frac{(k+80)}{2}$

04. 0607_s24_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)	15	3	**M2** for $\frac{6\times1+6\times2+3\times3+6\times4+x\times5+4\times6}{6+6+3+6+x+4}$ [=3.75] or better or **M1** for $6\times1+6\times2+3\times3+6\times4+x\times5+4\times6$ or better or for 3.75 × (6 + 6 + 3 + 6 + *x* + 4) or better
(b)(i)	12.8 or 12.78 to 12.79	2	**M1** for at least correct four mid-values soi
(b)(ii)(a)	7, 28, 51, 67, 70	2	**B1** for 3 correct
	In **(b)**, **(c)** and **(d)** marks can **only** be earned with an increasing curve or polygon at least as far as (25, 67 **FT**)		
(b)(ii)(b)	Correct curve	3	**B1 FT** for 5 points with correct heights **B1** for 5 points with correct *t* values
(b)(ii)(c)	11 to 12	1	**FT**
(b)(ii)(d)	26, 27, 28, 29 or 30 cao	2	**B1** for 40 to 44 seen or **B1FT** for *their* reading from *t* = 13

05. 0607_s24_ms_43 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	0	1	
(a)(ii)	2	1	
(a)(iii)	6	1	
(a)(iv)	3	1	
(a)(v)	2.175	2	**M1** for [0 × 26] + 1 × 20 + 2 × 23 ...
(b)	14	3	**M2** for $\frac{[0\times18]+1\times31+2\times27+3\times18+4\times n+5\times12+6\times5}{18+31+27+18+n+12+5}=2.28$ oe or **M1** for $[0\times18]+1\times31+2\times27+3\times18+4\times n+5\times12+6\times5$ or for (18 + 31 + 27 + 18 + *n* + 12 + 5) × 2.28

06. 0607_m23_ms_42 Q: 1

Question	Answer	Marks	Partial Marks
(a)	9	**1**	
(b)	10	**1**	
(c)	6	**1**	
(d)	4	**1**	
(e)	5.71 or 5.706 to 5.707	**2**	**M1** for attempt at fx/f

07. 0607_m23_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
	In parts **(b)**, **(c)** and **(d)**, marks can only be earned with an increasing curve		
(a)	169.31 or 169 or 169.3	**2**	**M1** for use of mid-points e.g. 24 × 152.5 + 42×157.5 + 84 × 162.5 …
(b)	[24], 66, 150, 256, 368, 455, [500]	**1**	
(c)	Correct curve (155, 24) (160, 66) (165, 150) (170, 256) (175, 368) (180, 455) (185, 500)	**3**	**M1** for horizontal plot correct **M1** for at least 5 vertical plots correct
(d)(i)	175 to 176.5	**1**	**FT** *their* curve

Question	Answer	Marks	Partial Marks
(d)(ii)	18 to 20	**2**	**B1** for 90 to 100 or **M1** for $\frac{\textit{their}\ 90}{500}$ [×100] soi

08. 0607_s23_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	5	**1**	
(a)(ii)	5	**1**	
(a)(iii)	6	**1**	
(a)(iv)	1.5	**2**	**B1** for [u.q. =] 6.5 or [l.q. =] 5
(a)(v)	5.6 or $5\frac{3}{5}$	**2**	**M1** for $(1 \times 3 + 3 \times 4 + 8 \times 5 + 7 \times 6 + 7 \times 5 + 1 \times 8) \div 25$
(b)	72	**2**	**M1** for $\frac{5}{25}$ [×360] or $\frac{360}{25}$ [×5]
(c)	12	**2**	**M1** for $\frac{8}{3}$ [×4.5] or $\frac{4.5}{3}$ [×8]

09. 0607_s23_ms_43 Q: 3

Question	Answer	Marks	Partial Marks
(a)	57.5	**1**	
(b)	53.8 or 53.83…	**1**	
(c)	$0.791x + 13.2$	**2**	**M1** for $0.791x + k$ or $kx + 13.2$ or $0.79x + 13$
(d)(i)	53 or 52.7 to 52.8	**1**	**FT** *their* part **(b)**
(d)(ii)	18 or 17.90 to 17.95	**1**	**FT** *their* part **(b)**
(e)	50, within range or 50 as 6 is not in range	**1**	

10. 0607_w23_ms_41 Q: 3

Question	Answer	Marks	Partial Marks
(a)(i)	170	**1**	
(a)(ii)	22	**2**	**B1** for 158 or 180 seen
(a)(iii)	172	**2**	**B1** for 28 seen
(b)	28, 72, 48 to 52, 52 to 48 [total = 200]	**2**	**B1** for two or three correct
(c)	166.4 to 166.6	**2**	**M1** for 3 or more mid-values soi

11. 0607_w23_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	4 correct points plotted	**2**	**B1** for 3 correct
(a)(ii)	5.5	**1**	
(a)(iii)	$[y =] -0.323x + 7.48$	**2**	**B1** for $[y =] -0.323x + k$ or $[y=]\ kx + 7.48$ or $[y=]\ -0.32x + 7.5$
(a)(iv)	$[y =] -0.323x + 12.48$	**1**	**FT** *their* (k) + 5
(b)	12.5	**2**	**M1** for $x\left(\frac{100-36}{100}\right) = 8$ oe
(c)	3.57 or 3.565...	**2**	**M1** for $5\times5+4\times6+3\times9+2\times3$ implied by 82

12. 0607_w23_ms_43 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	20	**1**	
(a)(ii)	13.5	**1**	
(a)(iii)	12.9 or 12.91 to 12.92	**1**	
(a)(iv)	16	**1**	
(a)(v)	17.5	**1**	
(b)	It's the highest oe	**1**	

13. 0607_w23_ms_43 Q: 7

Question	Answer	Marks	Partial Marks
(a)(i)	182	**1**	
(a)(ii)	16	**2**	**B1** for [uq=]189 or [lq=] 173
(b)	170	**2**	**B1** for 48 seen
(c)	56, 84, 36, 12, 4	**2**	**B1** for 3 or 4 correct
(d)	181	**2**	**M1** for at least 4 mid-points soi

14. 0607_s19_ms_41 Q: 5

Question	Answer	Marks	Partial Marks
(a)	72	**2**	**M1** for $\frac{12}{60} \times 360$
(b)	$\frac{1}{4}$ oe	**1**	
(c)(i)	$\frac{4}{59}$ oe	**3**	**M2** for $\frac{12}{60} \times \frac{10}{59} + \frac{10}{60} \times \frac{12}{59}$ oe or **M1** for $\frac{12}{60} \times \frac{10}{59}$ or $\frac{10}{60} \times \frac{12}{59}$ soi $\frac{2}{59}$

Question	Answer	Marks	Partial Marks
(c)(ii)	$\frac{303}{590}$ oe	**3**	**M2** for $1 - \left(\frac{42}{60} \times \frac{41}{59}\right)$ oe or $\frac{18}{60} \times \frac{42}{59} + \frac{42}{60} \times \frac{18}{59} + \frac{18}{60} \times \frac{17}{59}$ or **M1** for $\frac{18}{60} \times \frac{42}{59}$ or $\frac{42}{60} \times \frac{18}{59}$ or $\frac{18}{60} \times \frac{17}{59}$ or $\frac{42}{60} \times \frac{41}{59}$

15. 0607_m22_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)(i)	7	**1**	
(a)(ii)	4	**1**	
(a)(iii)	5.5	**1**	
(a)(iv)	5	**1**	
(b)	115.65	**2**	**M1** for mid-values soi
(c)	17	**4**	**B3** for $25n + 845 = 25.4n + 838.2$ oe or better or **M2** for $3\times5+11\times15+n\times25+19\times35 = 25.4(n+3+11+19)$ oe or **M1** for $3\times5+11\times15+n\times25+19\times35$ oe or $25.4(n+3+11+19)$ or for correct trial with integer value of n

16. 0607_s21_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)	$100 < m \leqslant 120$	**1**	
(b)	$60 < m \leqslant 80$	**1**	
(c)	Any correct statement	**1**	

Question	Answer	Marks	Partial Marks
(d)	Correct labelled pie chart (labels indicating masses)	**4**	**B3** for pie chart with all angles correct or **B2** for pie chart with two angles correct or **B1** for 2 correct angles calculated **B1** for correct labels on sectors.

17. 0607_s21_ms_43 Q: 5

Question	Answer	Marks	Partial Marks
(a)	178 or 178.4 to 178.5	**2**	**M1** for evidence of mid-values
(b)	[x =] 7 [y =] 18	**3**	**B2** for $y = 18$ or **M1** for $([x \times 0] + y\ [\times 1] + 30 \times 2 + 45 \times 3) \div 100 = 2.13$ oe If 0 scored **SC1** for *their* x + *their* $y = 25$

18. 0607_w21_ms_41 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	7	**1**	
(a)(ii)	5	**1**	
(a)(iii)	8	**1**	
(a)(iv)	6.81 or 6.812 to 6.813	**2**	**M1** for $5 \times 16 + 6 \times 18 + 7 \times 25 + 8 \times 11 + 9 \times 6 + 10 \times 4$
(b)	You do not actually know the biggest **and** the smallest oe	**1**	

19. 0607_s20_ms_41 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	5	**1**	
(a)(ii)	7.9	**1**	
(a)(iii)	8	**1**	
(a)(iv)	9	**1**	
(b)(i)	1.5	**1**	
(b)(ii)	1	**1**	
(b)(iii)	1.4	**1**	
(b)(iv)	18	**2**	**B1** for 102 stated
(b)(v)(a)	20, 22, 18	**3**	**B1** for each
(b)(v)(b)	1.71 or 1.712 to 1.713	**2**	**M1** for mid-values soi

20. 0607_s20_ms_43 Q: 8

Question	Answer	Marks	Partial Marks
(a)(i)	5	**1**	
(a)(ii)	4	**1**	
(a)(iii)	3.46	**2**	**M1** for $\frac{\sum fx}{100}$
(b)(i)	$\frac{20}{9900}$ oe	**2**	**M1** for $\frac{5}{100}\times\frac{4}{99}$ oe
(b)(ii)	$\frac{896}{9900}$	**3**	**M2** for $\frac{16}{100}\times\frac{28}{99}+\frac{28}{100}\times\frac{16}{99}$ oe or **M1** for one of the above products
(b)(iii)	$\frac{9558}{9900}$	**2**	**M1** for $1-\frac{19}{100}\times\frac{18}{99}$ oe

21. 0607_s19_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)	$50 < t \leqslant 55$	**1**	Allow e.g. 50 to 55
(b)	50	**2**	**M1** for at least three of 30, 45, 52.5, 65 soi
(c)	Correct histogram	**4**	**B1** for each correct column height. **B1** for all widths correct If 0 scored, **SC1** for 7, 24, 1.5 seen
(d)(i)	$\frac{30}{240}$ oe	**1**	
(d)(ii)	$\frac{22350}{57360}$ oe	**2**	**M1** for $\frac{150}{240} \times \frac{149}{239}$
(d)(iii)	40 ... 50	**2**	**M1** for $\frac{k}{240} \times \frac{k-1}{239}$ attempted

22. 0607_s18_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	198	**2**	**M1** for 3 or more 50, 120, 160, 215, 275 soi
(a)(ii)	$\frac{306}{9900}$ oe or 0.0309 or 0.030 90 to 0.030 91	**2**	**M1** for $\frac{18}{100} \times \frac{17}{99}$
(a)(iii)	$\frac{2850}{6642}$ oe or 0.429 or 0.4290 to 0.4291	**3**	**M2** for $\frac{57}{82} \times \frac{25}{81} + \frac{25}{82} \times \frac{57}{81}$ oe or **M1** for $\frac{57}{82} \times \frac{25}{81}$ or $\frac{25}{82} \times \frac{57}{81}$
(b)(i)	0.04, 0.35, 0.55, 0.5, 0.5	**2**	**B1** for 3 correct
(b)(ii)	Correct histogram	**4**	**FT** *their* fully completed table in **(b)(i)** with linear scale **B1** for suitable scale (must include all heights) **B1** for correct column widths **B2FT** for columns with all heights correct or **B1FT** for 3 or 4 columns with correct heights

23. 0607_w18_ms_43 Q: 11

Question	Answer	Marks	Partial Marks
(a)	70, 80, 30	**2**	**B1** for 2
(b)	156.25	**2**	**M1** for mid-values soi

24. 0607_s17_ms_42 Q: 11

Question	Answer	Marks	Partial Marks
(a)	12.9 or 12.86 to 12.87	**2**	**M1** for evidence of at least three mid-interval values 9.5, 11, 13, 15.5 soi by 95, 550, 845, 697.5 or 2187.5
(b)	Correct Histogram	**4**	**B1** for correct bar widths no gaps **B3** for 4 correct heights and corresponding scale from 0 or **B2** for 3 correct heights and corresponding scale from 0 or **B1** for 2 correct heights and corresponding scale from 0 or **B1** for 3 correct frequency densities soi
(c)(i)	$\frac{198}{2873}$ oe	**2**	**M1** for $\frac{45}{170}\times\frac{44}{169}$
(c)(ii)	$\frac{100}{2873}$ oe	**3**	**M2** for $\frac{10}{170}\times\frac{50}{169}+\frac{50}{170}\times\frac{10}{169}$ oe or **M1** for $\frac{10}{170}\times\frac{50}{169}$

25. 0607_s17_ms_43 Q: 10

Question	Answer	Marks	Part Marks
(a)(i)	3.0875	**2**	**M1** for 2.75, 3.125, 3.5 soi
(a)(ii)	Correct histogram	**3**	**B1** correct widths **B1** for two correct heights
(b)(i)	$\frac{200}{x}-\frac{200}{x+10}=\frac{20}{60}$ oe	**B2**	**B1** for $\frac{200}{x}$ or $\frac{200}{x+10}$
	$60\times200(x+10)-60\times200x=20x(x+10)$ oe	**M1**	i.e. correctly clearing fractions or all over common denominator
	$x^2+10x-6000=0$	**A1**	completion with at least one interim line and without any errors or omissions
(b)(ii)	2 h 45 min	**4**	**B2** for 72.6 or 72.62… or **M1** for correct use of formula or correct sketch **M1** for 200 ÷ *their* positive x, implied by 2.75.....

26. 0607_w17_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	18	1	
(a)(ii)	10	1	
(a)(iii)	12.5 cao	1	
(a)(iv)	13.25	1	
(a)(v)	6.5 nfww	2	**B1** for 17 or 10.5 seen
(b)	It is the largest oe	1	

27. 0607_w17_ms_43 Q: 4

Question	Answer	Marks	Partial Marks
(a)	171 cao nfww	3	**B2** for 171.25 or 171.3 or **M2** for complete method with 1 numerical error or **M1** for at least 3 mid-pts (60, 135, 165, 195, 230, 275) soi
(b)	$\frac{44}{595}$ cao	3	**B2** for $\frac{1056}{14280}$ oe accept 0.0739 or 0.07394 to 0.07395 or **M1** for $\frac{33}{120}\times\frac{32}{119}$
(c)(i)	0.1, 0.9, 1.1, 0.5, 0.7, [0.1]	2	**B1** for 3 or 4 correct
(c)(ii)	Correct histogram	4	**B1** for suitable scale **B1** for correct column widths **B1FT** for 4 or more correct heights

28. 0607_s16_ms_43 Q: 6

Question	Answer	Mark	Part Marks
(a)	166 or 165.6 to 165.7	2	**M1** for correct use of mid-pts at least 4 of (150, 157.5, 162.5, 167.5, 172.5,182.5)
(b) (i)	2.6, 13.2, 16.4, 23.6, 16.4, 1.73	2	**B1** for 4 or 5 correct
(ii)	Suitable vertical scale Correct column widths Correct heights	1 1 2FT dep	 **B1** for 4 or 5 correct **dep** on at least B1 in **(b)(i)**

29. 0607_w16_ms_41 Q: 9

Qu.	Answer	Mark	Part Marks
(a)	18, 20, 15, 20, 20	3	**B2** for 4 correct **B1** for 3 correct
(b)	3.3[0] or 3.295 to 3.296	2FT	**M1** for at least 3 mid-values seen, 0.5, 1.5, 2.5, 4, 7.5 If 0 scored, **SC1** for 2.26 or 2.258… or for 4.33 or 4.333… or $4.\dot{3}$
(c)	0.649 cao	2	**M1** for $\frac{their\,75}{their\,93}\times\frac{their\,74}{their\,92}$ (implied by $\frac{5550}{8556}$ or 0.6486 to 0.6487 oe)

30. 0607_w16_ms_42 Q: 1

Question	Answer	Mark	Part Marks
(a)	171	1	
(b)	10	1	
(c)	172	1	
(d)	4	2	**B1** for 170 or 174 seen
(e)	172.1	2	**M1** for attempt at $\sum fx$ soi by 24099 or 172 or 172.1...

31. 0607_s15_ms_41 Q: 1

Qu.	Answer	Mark	Part Marks
(a)	8	1	
(b)	10	1	
(c)	6	1	
(d)	4.5	2	**B1** for [LQ =] 3.5 or [UQ =] 8
(e)	5.375	1	

32. 0607_s15_ms_42 Q: 8

Qu.	Answer	Mark	Part Marks
(a) (i)	Any counted information	1	e.g. numbers in family, numbers of letters delivered, shoe sizes, marks in a test, number of cats, etc.
(ii)	Any measured information	1	e.g. lengths, ages, masses, heights
(b) (i)	160 165	1	
(ii)	165 170	1	
(iii)	166	2	**M1** for at least 3 midpoints soi
(iv)	Continuous information oe	1	e.g. lowest/highest anywhere between 150 and 155, using mid-points, grouped data, actual heights unknown, examples of values in an interval

33. 0607_w15_ms_41 Q: 6

Question	Answer	Mark	Part Marks
(a)	1.31 or 1.308…	2	**M1** for mid-values soi
(b)	Fully correct histogram	3	**B1** for correct widths 0.2, 0.2, 0.2, 0.4 **B2** for 4 correct heights or **B1** for 2 or 3 correct heights or for 180, 200, 160, 20 seen

34. 0607_m21_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	$110 < m \leqslant 130$	1	
(a)(ii)	135.2	2	**M1** for mid-values seen or implied
(b)(i)	(8) 16 38 77 104 113 120	2	**B1** for 4 or 5 correct **FT** one error
(b)(ii)	Correct cumulative frequency curve	3	**B2** for 6 points correct OR **B1FT** for 7 heights correct **B1** for plotting at upper boundary of interval
(b)(iii)(a)	124 to 127 nfww	1	
(b)(iii)(b)	14 to 21	2	**B1** for [LQ =] 115 to 118 or [UQ =] 132 to 136

35. 0607_w21_ms_41 Q: 6

Question	Answer	Marks	Partial Marks
(a)	Correct cumulative frequency curve	**4**	Through (25,4), (50, 30), (75,90), (100, 178), (125, 284), (150, 300) **B3** for one plotting error OR **B1** for 4, 30, 90, 178, 284, 300 soi **B1FT** for CF diagram at correct heights **B1FT** for CF plotting at RH end of interval FT dependent on increasing curve.
(b)	36 to 44	**2**	**FT** *their* CF diagram **B1 FT** for LQ = 68 to 72 or UQ = 108 to 112
(c)	33.3 or 33.33... to 36.7 or 36.66 to 36.67	**2**	**B1** for 100 to 110 or **M1** for correct percentage calculated from *their* reading.

36. 0607_w21_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	190	**1**	
(a)(ii)	156	**1**	
(a)(iii)	22	**2**	**B1** for LQ = 140 or UQ = 162
(a)(iv)	28	**2**	**B1** for 172 seen
(b)	150.45	**2**	**M1** for at least 3 mid-values soi

37. 0607_w21_ms_43 Q: 1

Question	Answer	Marks	Partial Marks
(a)(i)	5	**1**	
(a)(ii)	10	**1**	
(a)(iii)	6	**1**	
(a)(iv)	3	**2**	**B1** for LQ = 5 or UQ = 8
(a)(v)	5.93 or 5.927 to 5.928	**2**	**M1** for attempt at $\sum fx$
(b)	7.23 or 7.24 or 7.232 to 7.237	**2**	**M1** for $(320 \times 6.5 - 180 \times$ *their* **(a)(v)**$)$[/140] oe

38. 0607_s20_ms_42 Q: 1

Question	Answer	Marks	Partial Marks
(a)	6	1	
(b)	10	1	
(c)	6	1	
(d)	4	2	**B1** for LQ = 4 or UQ = 8
(e)	5.55	2	**M1** for attempt at $\sum fx$ (3 or more terms correct)
(f)	$\frac{1}{120} = \frac{13}{1560}$ or 0.0083 recurring or 0.008333...	3	**M2** for two of $\left(\frac{1}{40}\times\frac{2}{39}\right)+\left(\frac{2}{40}\times\frac{1}{39}\right)+\left(\frac{9}{40}\times\frac{1}{39}\right)$ or **M1** for any one of above products

39. 0607_s20_ms_43 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	74	1	
(a)(ii)	18	2	**B1** for 64 or 82
(a)(iii)	38	2	**B1** for 82

Question	Answer	Marks	Partial Marks
(b)(i)	Correct graph	3	**B1** for minimum at (10, *h*) where $h < 30$, lq and median correct **B1** for uq correct **B1** for maximum correct
(b)(ii)	Answer in range 50 to 60	2	**B1** for 74 or 14 to 24
(b)(iii)	[A is] steeper oe	1	

40. 0607_w20_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)(i)	50	1	
(a)(ii)	24	2	**B1** for [l.q. =] 38 or [u.q. =] 62 seen but not as final answer
(b)	68 or 69	3	**M1** for $120 \times \frac{15}{100}$ oe (18) **M1** for reading at (120 – *their* 18) seen

41. 0607_s19_ms_41 Q: 4

Question	Answer	Marks	Partial Marks
(a)	27.7 or 27.70 to 27.71	**2**	**M1** for at least 3 midpoints soi
(b)	Correct cf curve	**5**	Curve/polygon through (10, 0), (20, 16), (25, 44), (30, 76), (35, 100), (40, 114), (50, 120) or **B4** for curve through 5 or 6 points or 7 points with no curve or **B3** for 'correct curve' through all other consistent points in interval or **B2** for all correct cfs or **B1** for 4 or 5 correct cfs. If 0 scored **SC1** for any cumulative frequency diagram.
(c)(i)	26 to 28	**1**	Dep on increasing curve **FT**
(c)(ii)	9 to 11.5	**2**	Dep on increasing curve **FT** **B1** for lq = 22 to 23.5 or uq = 32.5 to 33.5
(c)(iii)	10 to 15	**2**	Dep on increasing curve **FT** **B1** for 105 to 110 seen
(d)(i)	5.6, 6.4, 4.8, 2.8, 0.6	**2**	**B1** for 3 or 4 correct
(d)(ii)	Correct histogram	**3**	**B2 FT** for bars with *their* heights or **B1FT** for 3 or 4 bars with *their* heights or bars with all correct widths

42. 0607_w19_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)	6	**1**	
(b)	7	**1**	
(c)	7.5	**1**	
(d)	9.5	**1**	
(e)	3	**1**	
(f)	8	**1**	

43. 0607_w19_ms_41 Q: 8

Question	Answer	Marks	Partial Marks
(a)(i)	Correct curve	**3**	**B2** for two of (2500, 100), (3000, 180), (4000, 200) plotted or **B1** for 100, 180, 200 soi
(a)(ii)	600 to 700	**2**	**B1** for [u.q.=] 2750 to 2800 or [l.q. =] 2100 to 2150 not as final answer
(a)(iii)	5 to 15	**2**	**B1** for 185 to 195 seen
(b)(i)	600, 600, 300	**2**	**B1** for two correct
(b)(ii)	118.75	**2**	**M1** for at least two of $25 \times 500 + 75 \times$ *their* $600 + 150 \times$ *their* $600 + 300 \times$ *their* 300

44. 0607_w19_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)	129.25	**2**	**M1** for at least 3 of 50, 110, 130, 150, 205 seen
(b)	$140[< m \leqslant] 160$	**1**	
(c)	$\frac{189}{1580}$	**3**	**B2** for 0.12[0] or 0.1196... or $\frac{756}{6320}$ oe or **M1** for $\frac{28}{80} \times \frac{27}{79}$

Question	Answer	Marks	Partial Marks
(d)(i)	0.06, 1.1, 1.55, 0.65, 0.0889 or 0.08888 to 0.08889	**2**	**B1** for 3 or 4 correct
(d)(ii)	Correct histogram	**3**	**B1** for correct widths **B2 FT** for all heights correct or **B1 FT** for 3 or 4 correct heights

45. 0607_w19_ms_43 Q: 2

Question	Answer	Marks	Partial Marks
(a)	1	**1**	
(b)	7	**1**	
(c)	2	**1**	
(d)	2	**2**	**B1** for 1 or 3 seen but not final answer
(e)	2.22	**2**	**M1** for $(0 \times 17 + 1 \times 23 + 2 \times 20 + ...) \div 100$

46. 0607_s18_ms_41 Q: 4

Question	Answer	Marks	Partial Marks
(a)(i)	1 | 7 8 9 9 2 | 0 1 1 1 1 2 2 3 4 5 e.g. 2|3 = 23	3	**B1**for each row **B1** for key
(a)(ii)	21 19	2	**B1** for each
(a)(iii)	102.8 to 102.9	2	**M1** for $\frac{4}{14}$ oe or $\frac{360}{14}$ oe
(b)(i)	2.4	1	
(b)(ii)	0.9	2	**B1** for 3 or 2.1 seen
(b)(iii)	20	2	**M1** for 180 seen
(c)(i)	253.125 or 253.13 or 253.1 or 253	2	**M1** for evidence of at least two mid-values 150, 225, 325 soi by e.g. 50625
(c)(ii)	Correct histogram	4	**B1** for bars with correct widths **B1** for first bar with height 0.25 **B1** for second bar with height 2 **B1** for third bar with height 0.5 If 0 scored **SC1** for three correct frequency densities seen

47. 0607_s18_ms_43 Q: 1

Question	Answer	Marks	Partial Marks
(a)	10	1	
(b)	6 nfww	2	**B1** for 17 or 11 seen
(c)	10	1	
(d)	15	1	
(e)	14.5 or 14.51 to 14.52	2	**M1** for Σxf soi by e.g. 450
(f)	It is the smallest oe	1	

48. 0607_w18_ms_41 Q: 2

Question	Answer	Marks	Partial Marks
(a)	1	**1**	
(b)	8	**1**	
(c)	2	**1**	
(d)	3	**2**	**B1** for either [LQ =] 1, or [UQ =] 4
(e)	2.93 or 2.933…	**2**	**M1** for '$\sum fx$' values
(f)	Assumed all scored 6 oe	**1**	
(g)	0.182 or 0.1816... or $\frac{1008}{5550}$ oe	**3**	**M2** for $\frac{16}{75}\times\frac{15}{74}+\frac{16}{75}\times\frac{24}{74}+\frac{24}{75}\times\frac{16}{74}$ oe or **M1** for one correct product **SC1** for $\frac{1560}{5550}=\frac{52}{185}=0.28108...$

49. 0607_w18_ms_42 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	15	**1**	
(a)(ii)	6	**1**	
(a)(iii)	11.5	**1**	
(a)(iv)	11.6 or 11.58...	**1**	
(a)(v)	7.5	**2**	**B1** for 7 or 14.5 seen
(b)	$\frac{2}{12}$ oe	**1**	

50. 0607_w18_ms_42 Q: 9

Question	Answer	Marks	Partial Marks
(a)	Correct cf curve through 7 more points	4	**B3** for curve through 5 or more correct points or **B2** for curve through 4 correct points or correct cfs 2, 6, 12, 24, 46, 80, 108, 120 or **B1** for curve through 3 correct points or 5,6 or 7 cfs
(b)(i)	63 to 66	1	Only from increasing diagram
(b)(ii)	17 to 23	2	**B1** for LQ = 52 to 55 or UQ = 72 to 75 Only from increasing diagram
(b)(iii)	4 to 8	2	**B1** for 112 to 116 seen Only from increasing diagram
(c)	Correct cumulative frequency curve	3	**B1** for lowest and highest points plotted correctly **B1**for median and lower quartile plotted correctly **B1**for upper quartile plotted correctly Maximum 2 marks if points not joined

51. 0607_s17_ms_41 Q: 2

Question	Answer	Marks	Partial Marks
(a)	31.1	2	**M1** for evidence of at least 3 correct midpoints
(b)(i)	[7], 20, 40, 72, 100	1	
(b)(ii)	Correct Graph	3	**B1** for plotting *their* points at upper group limit (but points must be increasing vertically) **B1** for 4 or 5 correct **FT** vertical plots (must be increasing)
(c)(i)	32.5 to 34.5	1	**FT** *their* graph, dependent on increasing curve
(c)(ii)	16.5 to 20	2	**FT** *their* graph, dependent on increasing curve **B1** for UQ = 40.5 to 42 or LQ = 22 to 24 or **M1** for *their* UQ – *their* LQ
(c)(iii)	3 to 4	3	**FT** *their* graph, dependent on increasing curve **M2** for *their* 55 th percentile (34 to 36) and *their* 45 th percentile (31 to 33) or **M1** for *their* 45th percentile (31 to 33) or *their* 55th percentile (34 to 36) or **SC3** for e.g. 32 to 35

52. 0607_w17_ms_42 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	$50 < t \leqslant 60$	1	
(a)(ii)	Correct curve	4	**B2** for 3 or 4 correct heights or **B1** for 2 correct heights or correct cumulative frequencies seen **B1** for plotting correct t co-ordinates, **dependent** on increasing curve
(a)(iii)(a)	52 to 55	1	**FT** *their* curve, **dependent** on increasing
(a)(iii)(b)	Strict follow through	2	**FT** *their* curve, **dependent** on increasing **B1FT** for *their* cum freq value soi
(b)(i)	52.5 or 52.48 to 52.49	2	**M1** for evidence of at least three correct mid-values 30, 45, 52.5, 57.5, 70 soi by 10497.5
(b)(ii)	1.3, … , 11, 8.4, 1.9	2	**B1** for 3 correct
(b)(iii)	Correct histogram	3	**FT** *their* (ii) **B1** for correct widths **B2** for correct heights or **B1** for three correct heights

53. 0607_s16_ms_41 Q: 12

Question	Answer	Mark	Part Marks
(a)	63.6	2	**M1** for midpoints (47.5, 52.5, 57.5, 62.5, 67.5, 72.5, 77.5) soi
(b)	Correct Curve	5	**B4** for 5 points correct and joined or for 6 points correct or **B3** for at least 3 correct points or **B2** for all correct cfs 5, 24, 58, 116, 162, 191, 200 seen or **B1** for at least 3 correct cfs or for increasing curve with 6 points plotted at upper bounds If 0 or 1 or 2 scored, **SC3** for **all** points correct but consistently translated to mid-interval or lower bound.
(c) (i)	63 to 64	1	Dependent on increasing curve
(ii)	8.5 to 10.5	2	**B1** for[l.qtile. =] 58.5 to 59.5 or [u.qtile. =] 68 to 69 Dependent on increasing curve
(d) (i)	$\frac{12 \text{ to } 16}{200}$ oe	1FT	**FT** (*their* 'read off' at 53)/200 dep on increasing cfs
(ii)	$\frac{72}{39800}$ oe	2	**M1** for $\frac{k}{200} \times \frac{k\text{-}1}{199}$ where k = 8, 9 or 10

54. 0607_s16_ms_42 Q: 3

Question	Answer	Mark	Part Marks
(a) (i)	60	1	
(ii)	8	2	**B1** for [lq =] 56 or [uq =] 64
(iii)	12	2	**M1** for 188 seen
(b)	68.6 or 68.57...	3	**M2** for $50 \times \frac{2.4}{1.75}$ oe or **M1** for *their* distance ÷ 1.75 or **B1** for distance = 120 or for 2.4 and 1.75 or 144 and 105 or 8640 and 6300 seen If 0 scored, **SC1** for 77.2 or 77.24…

55. 0607_w16_ms_42 Q: 5

Question	Answer	Mark	Part Marks
(a)	36.7 or 36.68 to 36.69	2	**B1** for at least 3 of (7.5, 17.5, 30, 42.5, 70) soi by 4402.5 Accept 37.2 or 37.18 to 37.19 for full marks and 3 of (8, 18, 30.5, 43, 70.5) soi for **B1**
(b)	0.8, 3.6, 2.6, 2.7, 1.47 or 1.466 to 1.467, 0.7	3	**B2** for 4 or 5 correct or **B1** for 2 or 3 correct

56. 0607_s15_ms_43 Q: 8

Qu.	Answer	Mark	Part Marks
(a)	6.8 or 6800	2	**M1** for clear evidence of midpoints used soi by figs 68
(b)	Correct plotting 7 correct points and drawing smooth curve	5	All FTS dep on increasing curve **B2** for correct cfs seen 8, 29, 60, 83, 93, 98, 100 or **SC1** for correct cfs with 1 error **B1FT** for 7 corrects height plotted **B1FT** for points plotted at 5, 6, 7, 8, 9, 10, 12 **B1 dep FT** for smooth curve dependent on increasing and dependent on **B1** for heights
(c) (i)	10	2FT	**B1 dep** for 90 **FT** dependent on increasing curve
(ii)	1600 to 1900	2FT	**B1dep FT** for 5.8 (or 5800) or 7.6 (or 7600) seen or answer 1.8 dependent on increasing curve

57. 0607_w15_ms_42 Q: 6

Question	Answer	Mark	Part Marks
(a)	49.3 or 49.33 to 49.34	2	**M1** for mid-points soi, at least 3 of (10, 25, 35, 45, 55, 70, 90) implied by 39470
(b)	146, 286, 446, 588, 700, 800	1	
(c)	Correct graph	3	**All marks in (c) and (d) are dependent on increasing curve.** **B1** for plotting points at upper group limit **B1FT** for correct vertical plots
(d) (i)	46 to 49	1	
(ii)	26 to 30	2	**B1** for 33 to 35, or 61 to 63 soi
(iii)	74 to 77	3	**M1** for 0.15×800 or 0.85×800 oe **M1** for **correct** use of *their* 680.

58. 0607_s21_ms_41 Q: 4

Question	Answer	Marks	Partial Marks
(a)	39.8 or 39.81 to 39.82	2	**M1** for at least 5 correct mid-points soi
(b)	[41], 73, 117, 167, 232, 280, [300]	1	
	In parts (c), (d) and (e), marks can only be earned with an increasing curve		
(c)	Correct curve (10, 41) (20, 73) (30, 117) (40, 167) (60, 232) (80, 280) (100, 300)	3	**M1** for horizontal plot correct **M1** for at least 6 vertical plots from their table correct

Question	Answer	Marks	Partial Marks
(d)(i)	35 to 38	1	
(d)(ii)	35 to 39	2	**B1** for [UQ =] 56 to 59 or [LQ =] 20 to 21
(e)	46 to 50	2	**B1** for 195 or 105 seen

59. 0607_s21_ms_42 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	31.9	1	
(a)(ii)	0.55	2	**M1** for [UQ =] 32.1 or [LQ =] 31.55 seen
(a)(iii)	32.15	2	**B1** for 128 seen
(b)(i)	Lower median (average) oe	1	
(b)(ii)	Smaller IQR oe	1	

60. 0607_w16_ms_43 Q: 7

Question	Answer	Mark	Part Marks
(a) (i)	[6], 18, 40, 77, 97, 114, [120]	1	
(ii)	Correct curve	3	All marks in (a) dependent on increasing cumulative frequencies **B2FT** for 6 points correctly plotted **B1FT** for 4 or 5 points correctly plotted If 0 scored **SC1** for 'correct' curve translated consistently to left.
(iii)	7100 to 7400	1FT	**FT** *their* graph
(iv)	750 to 1150	2	**B1** for LQ = 6700 to 6900 or UQ = 7650 to 7850
(v)	9 or 10 or 11	1	
(b)	Correct graph	4	**B3** for 6 correct heights or **B2** for 4 or 5 correct heights or **B1** for 2 or 3 correct heights **B1** for correct widths If 0 scored **B1** for correct frequency densities [0.006], 0.024, 0.044, 0.074, 0.04, 0.017, 0.006

61. 0607_s21_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)	Negative	1	
(b)	48.9[0]	1	
(c)(i)	$-120x + 11\,700$	2	**B1** for $-120x + k$ or $-kx + 11\,700$
(c)(ii)	6300 or 6294 to 6320	1	**FT** *their* (i)

62. 0607_s21_ms_43 Q: 6

Question	Answer	Marks	Partial Marks
(a)(i)	Positive	1	
(a)(ii)	$1.03x + 1.1[0]$ or $1.027...x + 1.095...$	2	**B1** for $1.03x + k$ or $kx + 1.1[0]$ or $1.027...x + k$ or $kx + 1.095...$

Question	Answer	Marks	Partial Marks
(a)(iii)	73	1	**FT** *their* (a)(ii)
(b)(i)	23	1	
(b)(ii)	54	1	
(b)(iii)	46.5	1	

63. 0607_w21_ms_41 Q: 3

Question	Answer	Marks	Partial Marks
(a)	5 points plotted correctly	**2**	**B1** for 3 or 4 points plotted correctly
(b)	Positive	**1**	
(c)	$0.587d + 37.4$	**2**	0.5869 to 0.5870, 37.35 to 37.36 **B1** for $0.587d + b$ or $ad + 37.4$, $a > 0$ or $0.59d + 37$
(d)	53.7 to 53.9	**1**	**FT** *their* **(c)**
(e)	Too far outside range of data oe	**1**	

64. 0607_s20_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)(i)	All four points correct	**2**	**B1** for two or three correct points
(a)(ii)	positive	**1**	
(b)	87	**1**	
(c)(i)	$[y =] 35.9 + 0.811x$	**2**	**B1** for $35.9 + kx$, or for $a + 0.811x$, If 0 scored **SC1** for $36 + 0.81x$
(c)(ii)	141	**1**	**FT** *their* (i)
(c)(iii)	Outside data range oe	**1**	

65. 0607_s20_ms_43 Q: 2

Question	Answer	Marks	Partial Marks
(a)	Five points plotted correctly	**2**	**B1** for 3 or 4 points plotted correctly
(b)	Positive	**1**	
(c)(i)	$0.957x - 9.76$	**2**	or 0.9574..., –9.764 to –9.765 **B1** for $0.957x - c$ or $mx - 9.76$
(c)(ii)	36 or 36.2 or 36.19...	**1**	**FT** *their* (i)

66. 0607_w20_ms_41 Q: 1

Question	Answer	Marks	Partial Marks
(a)	positive	**1**	
(b)(i)	61.2	**1**	
(b)(ii)	66	**1**	
(c)(i)	$[y =]\ 28.7 + 0.61[0]x$	**2**	**B1** for $[y =]\ 28.7 + kx$ or $[y =]k + 0.61[0]x$ or $29 + 0.6[1]x$
(c)(ii)	53 or 53.1	**1**	**FT** *their* **(i)**

67. 0607_w20_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)	4 correct points	**2**	**B1** for 2 or 3 correct points
(b)	Negative	**1**	
(c)	$[y =]\ -2.84x + 19[.0]$	**2**	2.844..., 19.03... **B1** for $-2.84x + b$ or $ax + 19[.0]$, $a < 0$ or $-2.8x + 19$
(d)	11[.0] or 11.1 or 11.04 to 11.08	**1**	**FT** *their* **(c)**

68. 0607_w20_ms_43 Q: 3

Question	Answer	Marks	Partial Marks
(a)(i)	5	**1**	
(a)(ii)	8	**1**	
(a)(iii)	7.5	**1**	
(a)(iv)	7	**1**	
(a)(v)	7.45	**2**	**M1** for at least three of the products 2×5, 7×6, 11×7, 13×8, 5×9, 2×10 soi by 298
(b)(i)	Four points correctly plotted	**2**	**B1** for 2 or 3 correct
(b(ii)	Positive	**1**	

Question	Answer	Marks	Partial Marks
(b)(iii)	$0.938x + 0.0405$ 0.9376 to 0.9377 0.04049 to 0.04050	**2**	**B1** for $0.938x + k$ or for $kx + 0.0405$ or for $0.94x + 0.04[0]$
(b)(iv)	15 or to 15.0 to 15.1	**1**	**FT**
(c)	13.75	**2**	**M1** for at least 3 mid-values seen 5, 12.5, 17.5, 30 implied by 45, 250, 105, 150 or 550

69. 0607_s19_ms_43 Q: 2

Question	Answer	Marks	Partial Marks
(a)(i)	59.4	**1**	
(a)(ii)	57.2	**1**	
(b)	$[y =]\ 21.8 + 0.596x$	**2**	**B1** for $[y =]\ 21.8 + kx$ or $[y =]k + 0.596x$ or $22 + 0.6[0]x$
(c)(i)	58 or 57.5 to 57.8	**1**	**FT** *their* **(b)**
(c)(ii)	25 or 24.8 or 24.75 to 24.78	**1**	**FT** *their* **(b)**
(d)	60 Data within range oe	**1**	Both needed

70. 0607_w19_ms_43 Q: 4

Question	Answer	Marks	Partial Marks
(a)	5 points plotted correctly	**2**	**B1** for 3 or 4 points correct
(b)	Positive	**1**	
(c)	$p = 0.78[0]m + 10.4$	**2**	0.7798 to 0.7799, 10.35... **B1** for $p = 0.780m + c$ or $p = km + 10.4$
(d)	54	**1**	**FT** *their* 0.780×56 + *their* 10.4
(e)	$[p =]\ 0.78[0]m + 15.4$ oe	**1**	**FT** *their* **(c)**

71. 0607_s18_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)(i)	Points correctly plotted	**3**	**B2** for 5 or 6 correct points **B1** for 3 or 4 correct points
(a)(ii)	Positive	**1**	
(b)(i)	17.1 or 17.09…	**1**	
(b)(ii)	21.2	**1**	
(c)(i)	$y = 14.2 + 0.411x$	**2**	**B1** for $14.2 + kx$ or $a + 0.411x$ If 0 scored, **SC1** for $14 + 0.41x$
(c)(ii)	22.4 or 22.39 to 22.42	**1**	**FT** *their* **(c)(i)**
(c)(iii)	cm/ml oe	**1**	

72. 0607_s18_ms_43 Q: 4

Question	Answer	Marks	Partial Marks
(a)	6 points plotted correctly	**3**	**B2** for 4 or 5 correct or **B1** for 2 or 3 correct
(b)(i)	Negative	**1**	
(b)(ii)	D	**1**	

Question	Answer	Marks	Partial Marks
(c)(i)	$p = -967d + 6300$	**2**	or $(-967.4$ to $-967.3)d + 6297$ to 6298 or **B1** for $-967d + k$ or $kd + 6300$
(c)(ii)	3980 or 4000 or 3975 to 3980	**1**	**FT**
(c)(iii)	[Too] far outside range of data oe	**1**	

73. 0607_w18_ms_43 Q: 5

Question	Answer	Marks	Partial Marks
(a)	7.5 9	**2**	**B1** for each
(b)	Positive	**1**	
(c)	[y =]0.681 (or 0.6812…)x + 1.98 (or 1.982…)	**2**	**B1** for 0.681 (or 0.6812…)$x + k$ or for $kx + 1.98$ (or 1.982…) or for $0.68x + 2$[.0]

74. 0607_s17_ms_42 Q: 3

Question	Answer	Marks	Partial Marks
(a)	6 points correct	**3**	**B2** for 4 or 5 correct or **B1** for 2 or 3 correct
(b)	Positive	**1**	
(c)(i)	$y = 0.787x + 0.356$ final answer	**2**	0.7874 to 0.7875, 0.3555 to 0.3556 **B1** for one correct or for $y = 0.79x + 0.36$ final answer
(c)(ii)	5.4[0]	**1**	**FT** from *their* (c)(i)

75. 0607_s17_ms_43 Q: 3

Question	Answer	Marks	Part Marks
(a)(i)	6.5	**1**	
(a)(ii)	4.5	**1**	
(a)(iii)	3	**1**	
(b)(i)	Positive	**1**	
(b)(ii)	13	**1**	
(b)(iii)	15.5	**1**	
(b)(iv)	$7.32t - 55.3$	**2**	$(7.322 \text{ to } 7.323)t - (55.25\ldots)$ **B1** for $7.32t + k$ or $kt - 55.3$ or **SC1** for $7.3t - 55$
(b)(v)	Correct line (positive gradient and not below the x-axis)	**2**	**B1** for positive gradient

76. 0607_w17_ms_41 Q: 4

Question	Answer	Marks	Partial Marks
(a)	6 points correctly plotted	**2**	± small square, **B1** for 4 or 5 points correct.
(b)	Positive	**1**	
(c)(i)	$10.6x + 5.7$[0]	**2**	or $a = 10.57\ldots$, $b = 5.702\ldots$ **B1** for $y = ax + b$ with either a or b correct. **SC1** for $11x + 5.7$
(c)(ii)	29[.0] or 28.95 to 29.02	**1**	Strict **FT** (*their* 10.6×2.2) + *their* 5.7
(c)(iii)	[Too far] outside range of data oe	**1**	

77. 0607_w17_ms_43 Q: 3

Question	Answer	Marks	Partial Marks
(a)(i)	Points correctly plotted	**2**	**B1** for 2 or 3 correct points
(a)(ii)	Negative	**1**	

Question	Answer	Marks	Partial Marks
(b)(i)	8	**1**	
(b)(ii)	18.3 or 18.33 or $18\frac{1}{3}$	**1**	
(c)(i)	$y = 97[.0] - 9.84x$	**2**	or 97.02... and –9.836... **B1** for 97[.0] + kx, or $a - 9.84x$, If 0 scored **SC1** for $97 - 9.8x$
(c)(ii)	21.2 to 21.3 or 21	**1**	Strict **FT** *their* (c)(i) provided a linear expression

78. 0607_s16_ms_41 Q: 5

Question	Answer	Mark	Part Marks
(a)	4 points plotted correctly	**2**	**B1** for 2 or 3 correct
(b)	Positive	**1**	Ignore comments on strength
(c) (i)	75	**1**	
(ii)	16.6	**1**	
(d) (i)	$0.168t + 3.96$	**2**	or $m = 0.1684$ to 0.1685, $c = 3.963$ to 3.964 **B1** for $n = mt + c$ with either m or c correct or **SC1** for $0.17t + 4[.0]$
(ii)	18	**1FT**	**FT** from *their* equation with $t = 85$, answer rounded or truncated to nearest whole number

79. 0607_s16_ms_43 Q: 10

Question	Answer	Mark	Part Marks
(a) (i)	Points correctly plotted	3	**B2** for 4 or 5 correct points **B1** for 2 or 3 correct points
(ii)	Positive	1	
(b) (i)	32.7	1	
(ii)	23.6	1	
(c) (i)	$[y =] -5.57 + 0.892x$	2	**B1** for $-5.57 + kx$, or **B1** for $a + 0.892x$, If 0 scored **SC1** for $-5.6 + 0.89x$
(ii)	21.2 or 21.19…	1FT	**FT** *their* (c)(i) using $x = 30$
(iii)	Outside range oe	1	

80. 0607_w16_ms_42 Q: 3

Question	Answer	Mark	Part Marks
(a)	Positive	1	
(b) (i)	12.15	1	
(ii)	66	1	
(c) (i)	$y = 37.2 + 2.37x$	2	Range 37.20 to 37.21 and 2.369 to 2.370 **B1** for $37.2 + kx$, or $a + 2.37x$, If 0 scored, **SC1** for $37 + 2.4x$
(ii)	82 or 82.2...	1	**FT** *their* (i)

81. 0607_s15_ms_41 Q: 9

Qu.	Answer	Mark	Part Marks
(a) (i)	All points correctly plotted	2	**B1** for 4 or 5 correct points
(ii)	Positive	1	
(b) (i)	4.4 cao final answer	1	
(ii)	98	1	
(c) (i)	$31.7 + 15.1x$ or 31.66 to 31.67 + (15.07 to 15.08)	2	**B1** for 31.7 (or 31.66 to 31.67) + px or q + (15.1 (or 15.07 to 15.08)) x or **SC1** for $15x + 32$
(ii)	91.94 to 92.1	1FT	**FT** *their* **(c)(i)**

82. 0607_s15_ms_42 Q: 5

Qu.		Answer	Mark	Part Marks
5	(a)	5 points plotted correctly	2	**B1** for 3 or 4 correct
	(b)	Positive	1	Ignore comments on strength
	(c) (i)	63.6	1	
	(ii)	42	1	Accept 42 000
	(d)	$1.04x - 24.4$	2	or $a = 1.044\ldots$, $b = -24.41$ to -24.40 **B1** for $y = ax + b$ with either a or b correct or **SC1** for $[1.[0]]x - 24$
	(e)	58 800 or 58 790 to 59 150	1FT	**FT** from *their* equation

83. 0607_w15_ms_42 Q: 3

Question	Answer	Mark	Part Marks
(a) (i)	57.2	1	
(ii)	56.8	1	
(b) (i)	$y = 25.9 + 0.54[0]x$ or 25.92 to 25.93, 0.5397…	2	**B1** for $25.9 + mx$, or **B1** for $c + 0.54x$, If 0 scored, **SC1** for $26 + 0.5x$ or better
(ii)	53 or 53.4 to 53.5	1FT	**FT** *their* **(b)(i)**

84. 0607_w15_ms_43 Q: 3

Question	Answer	Mark	Part Marks
(a) (i)	$60 < v \leqslant 70$	1	
(ii)	65.9 or 65.93 to 65.94	2	**M1** for at least 3 correct mid-values seen
(iii)	0.1, 2.5, 4.6, 8.2, 0.4 oe	3	**B2** for 3 or 4 correct or **B1** for 2 correct
(b)	$-0.286r + 35.4$ or $(-0.2861\ldots)r + (35.38$ to $35.39)$	2	**B1** for $(-0.286$ or $-0.2861\ldots)r + k$ or for $kr + (35.4$ or 35.38 to $35.39)$ or **SC1** for $-0.29r + 35$