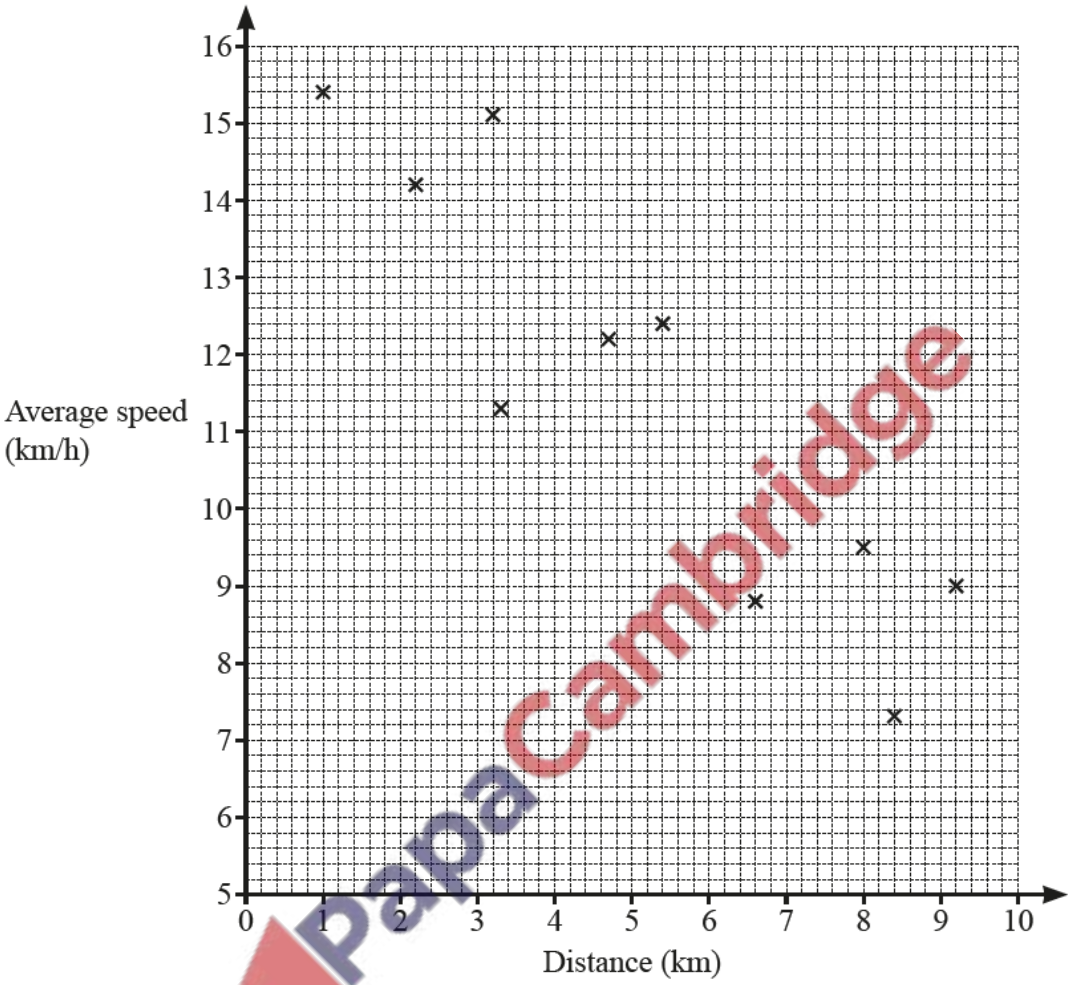
1. Nov/2020/Paper_11/No.18

Aisha records the distance she runs and her average speed.
The results are shown in the scatter diagram.



(a) The table shows the results of four more runs.

Distance (km)	4.2	5.7	7.1	8.8
Average speed (km/h)	13.4	11.8	9.8	8.3

On the scatter diagram, plot these points. [2]

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

..... [1]

(c) On the scatter diagram, draw a line of best fit. [1]

(d) Use your line of best fit to estimate her average speed when she runs a distance of 6 km.

..... km/h [1]

2. Nov/2020/Paper_12/No.12

Fernando records the favourite sport of each of 20 people.

football	cricket	rugby	cricket	rugby	rugby	football	football	rugby	football
cricket	rugby	tennis	football	tennis	football	rugby	cricket	football	cricket

(a) Complete the frequency table to show this information.
You may use the tally column to help you.

Favourite sport	Tally	Frequency
Cricket		
Football		
Rugby		
Tennis		

[2]

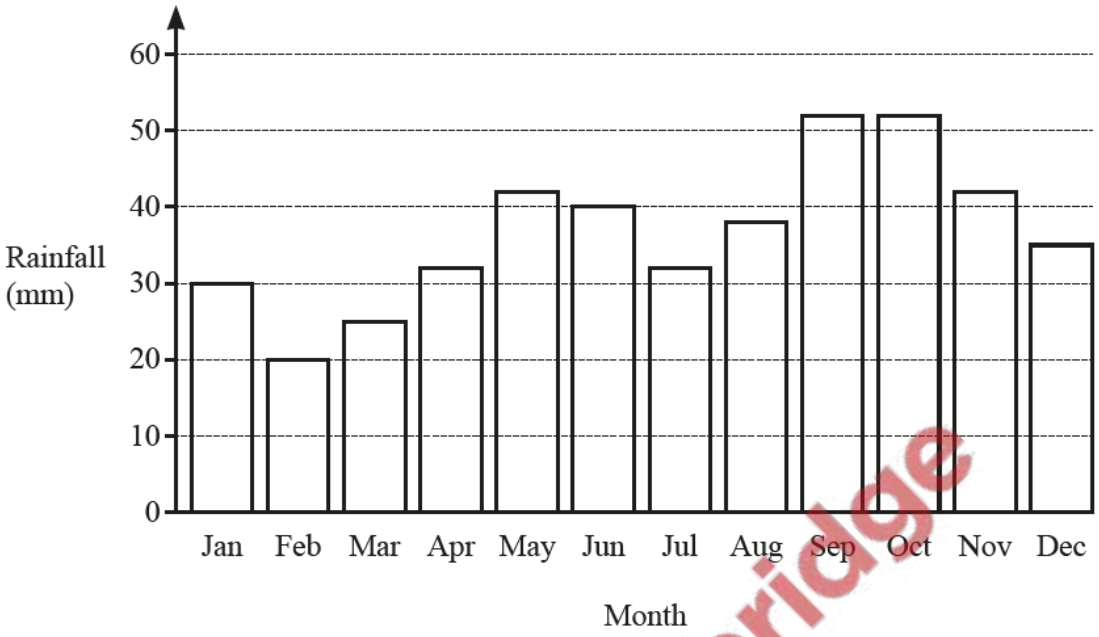
(b) Fernando wants to draw a pie chart to show this information.

Work out the sector angle for football.

..... [2]

3. Nov/2020/Paper_13/No.1

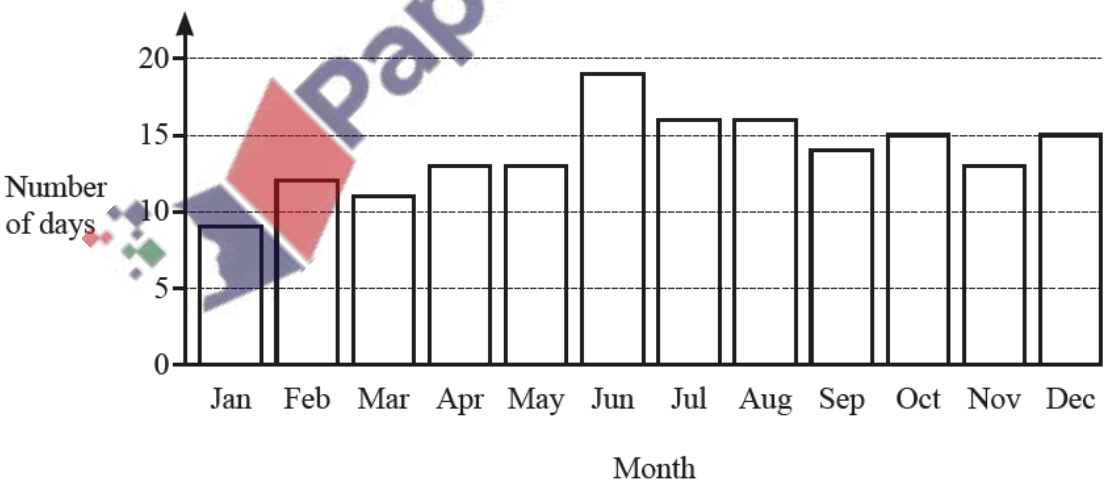
This bar chart shows the amount of rainfall, in mm, for each month of one year in a city.



(a) Write down the month with the least amount of rainfall.

..... [1]

(b) This bar chart shows the number of days it rained each month for the same year in this city.



Mia says that the months with the most rainfall also have the greatest number of days it rained.

Explain why she is wrong.

.....

..... [1]

4. Nov/2020/Paper_13/No.5

The mean of seven numbers is 16.

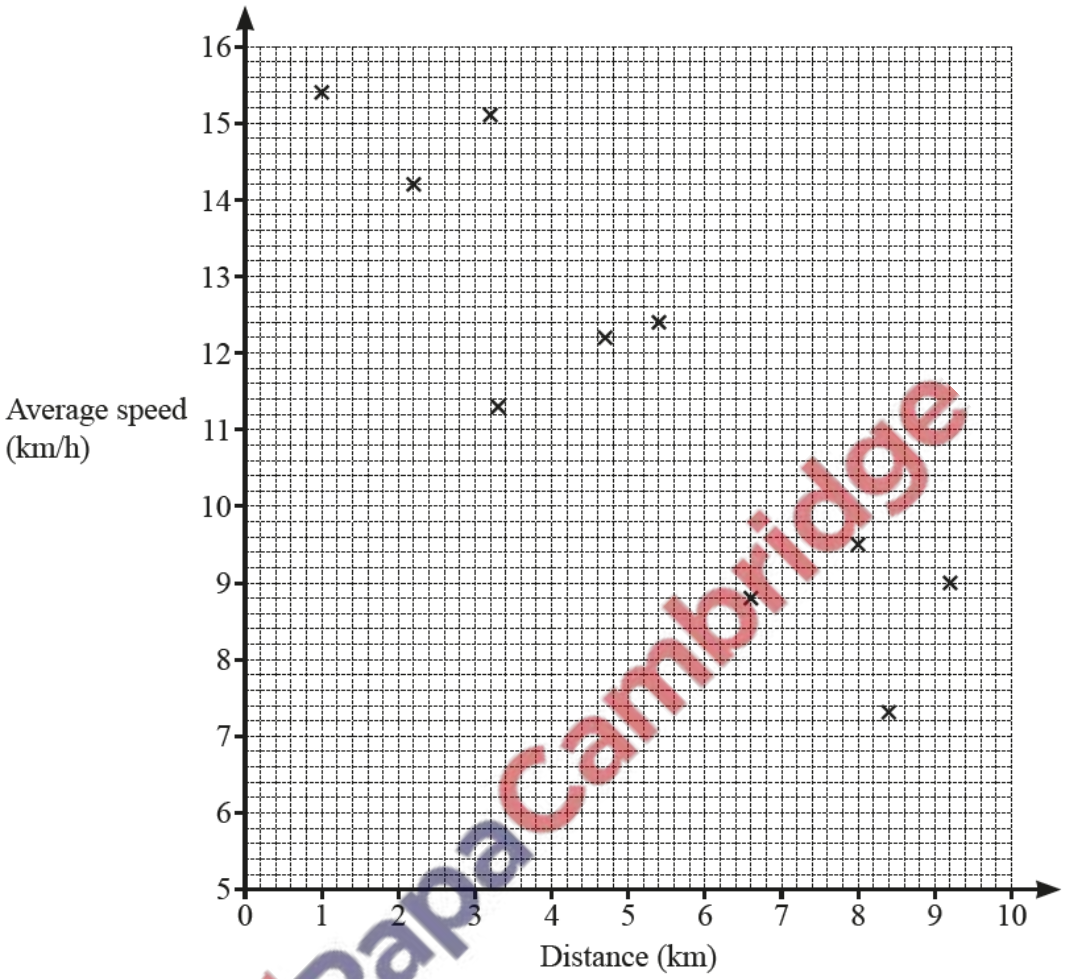
Six of these numbers are 12, 20, 19, 10, 21 and 13.

Find the seventh number.

..... [2]

5. Nov/2020/Paper_21/No.4

Aisha records the distance she runs and her average speed.
The results are shown in the scatter diagram.



(a) The table shows the results of four more runs.

Distance (km)	4.2	5.7	7.1	8.8
Average speed (km/h)	13.4	11.8	9.8	8.3

On the scatter diagram, plot these points. [2]

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

..... [1]

(c) On the scatter diagram, draw a line of best fit. [1]

(d) Use your line of best fit to estimate her average speed when she runs a distance of 6 km.

..... km/h [1]

6. Nov/2020/Paper_23/No.22

The table shows information about the times, t seconds, taken by each of 100 students to solve a puzzle.

Time (t seconds)	$0 < t \leqslant 10$	$10 < t \leqslant 15$	$15 < t \leqslant 20$	$20 < t \leqslant 40$	$40 < t \leqslant 75$
Frequency	9	18	22	30	21

(a) Calculate an estimate of the mean time.

..... s [4]

(b) Emmanuel draws a histogram to show this information.
The table shows the heights, in cm, of some of the bars for this histogram.

Complete the table.

Time (t seconds)	$0 < t \leqslant 10$	$10 < t \leqslant 15$	$15 < t \leqslant 20$	$20 < t \leqslant 40$	$40 < t \leqslant 75$
Height of bar (cm)	3.6	14.4	17.6		

[3]

7. Nov/2020/Paper_31/No.2c

(c) Ning has a spinner numbered 1 to 6.
She spins it 50 times and her results are shown in the table.

Number on spinner	Frequency
1	15
2	12
3	9
4	5
5	2
6	7

(i) Write down the mode.

..... [1]

(ii) Find the median.

..... [1]

(iii) Work out the mean.

..... [3]

8. Nov/2020/Paper_32/No.5

(a) Here are the weekly wages, in dollars, of the ten workers in an office.

280 200 175 1180 95 182 238 256 194 250

(i) Find the median.

$ ..... [2]

(ii) Calculate the mean.

$ ..... [2]

(iii) For this office, explain why the mean is not a suitable average.

..... [1]

(b) The stem-and-leaf diagram shows the ages of the workers in a factory.

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

Key : 2 | 3 represents 23

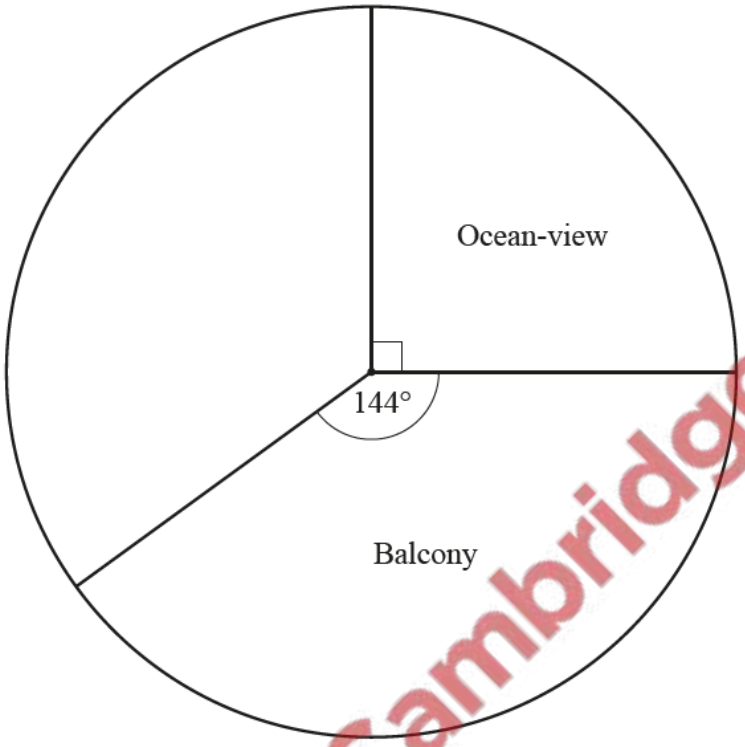
(i) Write down the mode.

..... [1]

(ii) Work out the range.

..... [1]

(f) There are 480 cabins on the ship.
There are four types of cabin: Ocean-view, Balcony, Interior and Suite.
Hannah starts to draw a pie chart to show the numbers of each type of cabin.



(i) Show that there are 120 Ocean-view cabins on the ship.

[1]

(ii) The table shows information about each type of cabin.

Type of cabin	Number of cabins	Sector angle in a pie chart
Ocean-view	120	90°
Balcony	192	144°
Interior	68	
Suite	100	

(a) Complete the table.

[2]

(b) Complete the pie chart. [1]

10. Nov/2020/Paper_33/No.5

The table shows the maximum power, kW, and the time taken, in seconds, to accelerate from 0 to 100 km/h for each of 10 cars.

Maximum power (kW)	77	52	103	55	44	51	85	135	90	110
Time (seconds)	12.5	14.9	9.0	12.1	14.4	12.9	10.0	7.1	11.0	9.4

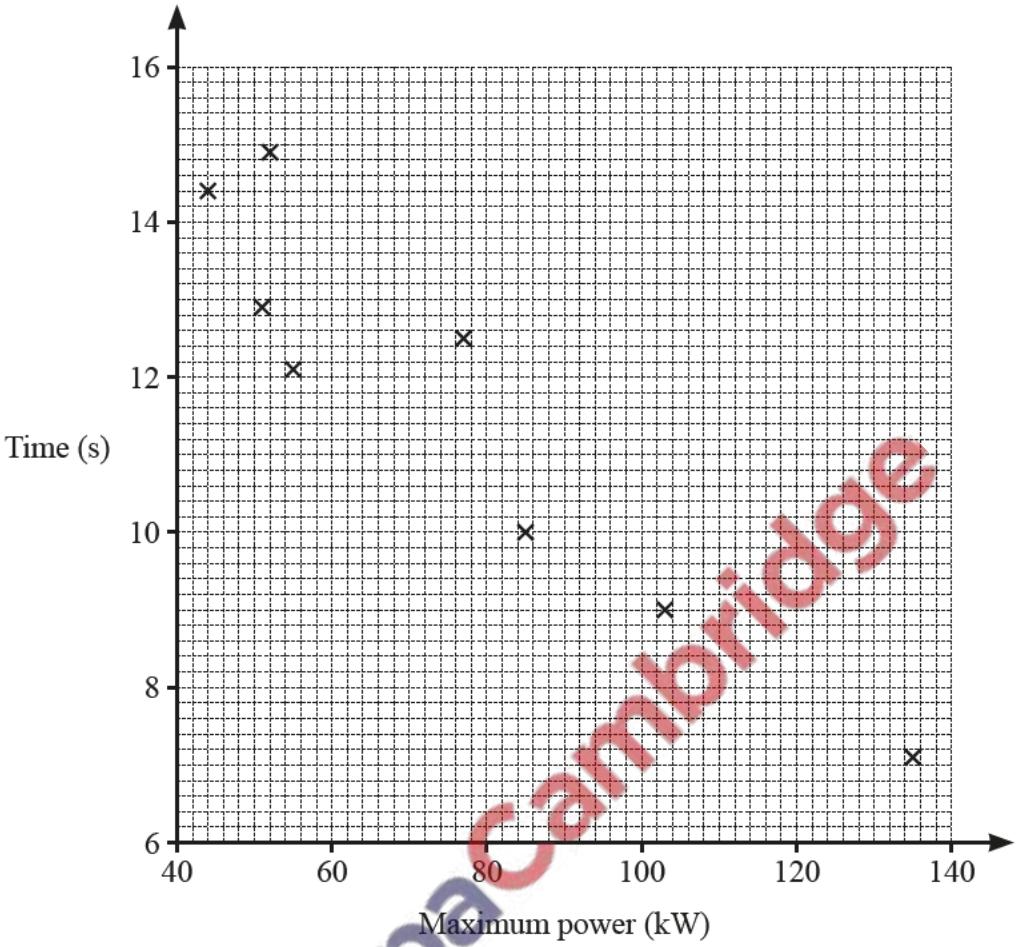
(a) (i) Find the range of the times.

..... s [1]

(ii) Find the median maximum power.

..... kW [2]

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



[1]

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

..... [1]

(iii) Describe the relationship between the maximum power of a car and the time taken to accelerate from 0 to 100 km/h.

.....

..... [1]

(iv) Draw a line of best fit on the scatter diagram. [1]

(v) Another car has a maximum power of 63 kW.

Use your line of best fit to estimate the time taken for this car to accelerate from 0 to 100 km/h.

..... s [1]

(c) Robert buys a car for $18 160.

He pays a deposit of $6460.
He pays the rest of the money in 24 equal monthly payments.

Work out the amount of each monthly payment.

$ ..... [3]

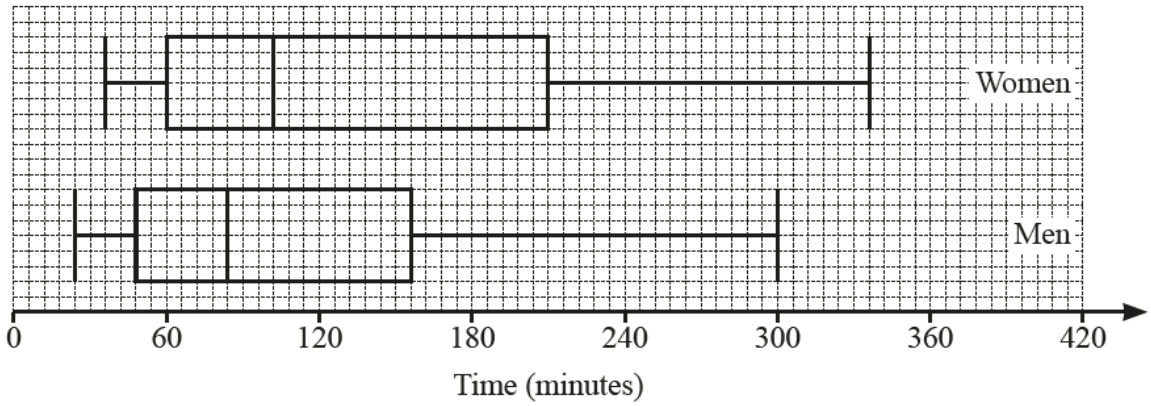
(d) A fuel tank holds 52 litres when full.
The tank is a quarter full.
Jim fills the tank with fuel that costs $2.18 per litre.

Work out how much Jim pays.

$ ..... [3]

11. Nov/2020/Paper_41/No.3

(a)



The box-and-whisker plots show the times spent exercising in one week by a group of women and a group of men.

Below are two statements comparing these times.
For each one, write down whether you agree or disagree, giving a reason for your answer.

Statement	Agree or disagree	Reason
On average, the women spent less time exercising than the men.		
The times for the women show less variation than the times for the men.		

[2]

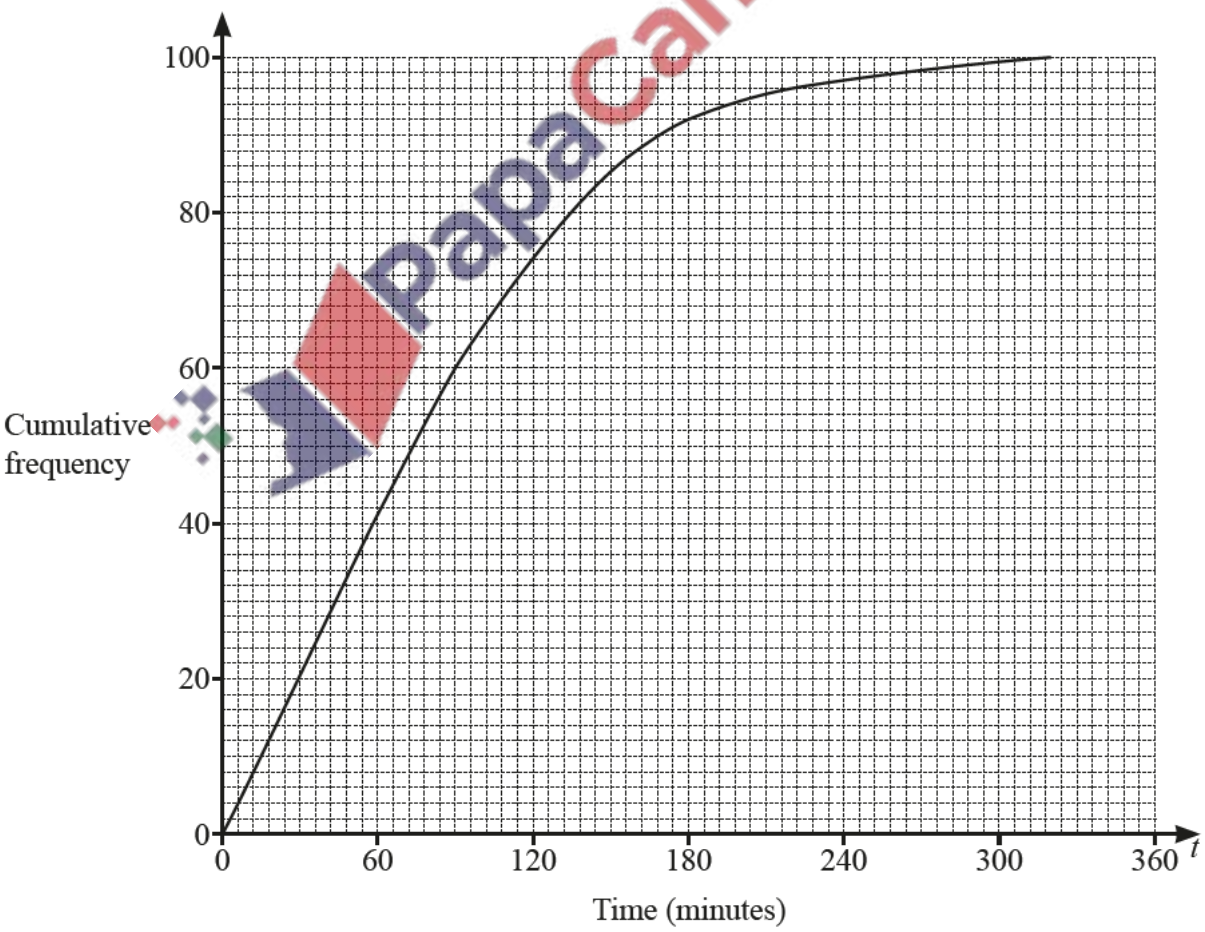
(b) The frequency table shows the times, t minutes, each of 100 children spent exercising in one week.

Time (t minutes)	$0 < t \leqslant 60$	$60 < t \leqslant 100$	$100 < t \leqslant 160$	$160 < t \leqslant 220$	$220 < t \leqslant 320$
Frequency	41	24	23	8	4

(i) Calculate an estimate of the mean time.

..... min [4]

(ii) The information in the frequency table is shown in this cumulative frequency diagram.



Use the cumulative frequency diagram to find an estimate of

(a) the 60th percentile,

..... min [1]

(b) the number of children who spent more than 3 hours exercising.

..... [2]

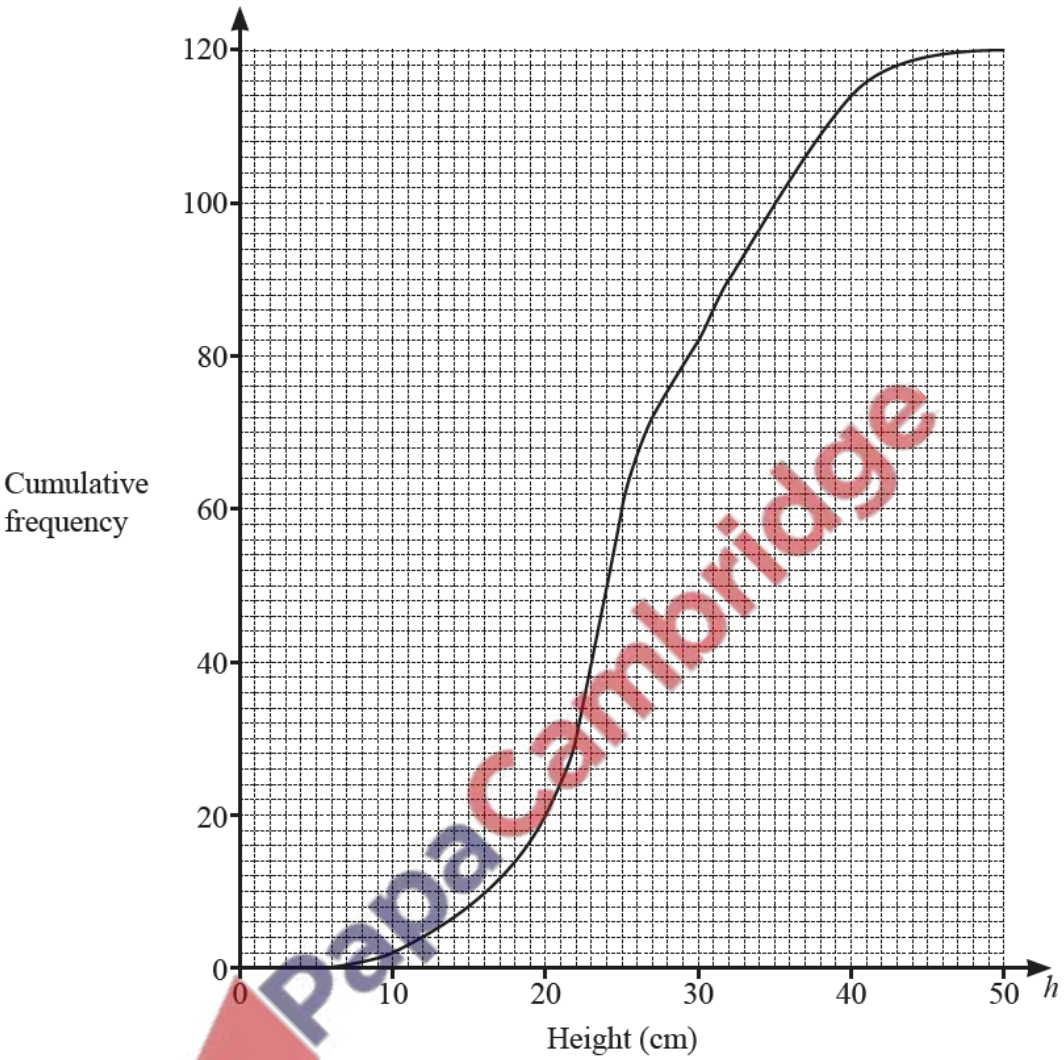
(iii) A histogram is drawn to show the information in the frequency table.
The height of the bar for the interval $60 < t \leqslant 100$ is 10.8 cm.

Calculate the height of the bar for the interval $160 < t \leqslant 220$.

..... cm [2]

12. Nov/2020/Paper_42/No.4

The height, h cm, of each of 120 plants is measured.
The cumulative frequency diagram shows this information.



(a) Use the cumulative frequency diagram to find an estimate of

(i) the median,

..... cm [1]

(ii) the interquartile range,

..... cm [2]

(iii) the 60th percentile,

..... cm [1]

(iv) the number of plants with a height greater than 40 cm.

..... [2]

(b) The information in the cumulative frequency diagram is shown in this frequency table.

Height, h cm	$0 < h \leqslant 10$	$10 < h \leqslant 20$	$20 < h \leqslant 30$	$30 < h \leqslant 50$
Frequency	2	18	62	38

(i) Calculate an estimate of the mean height.

..... cm [4]

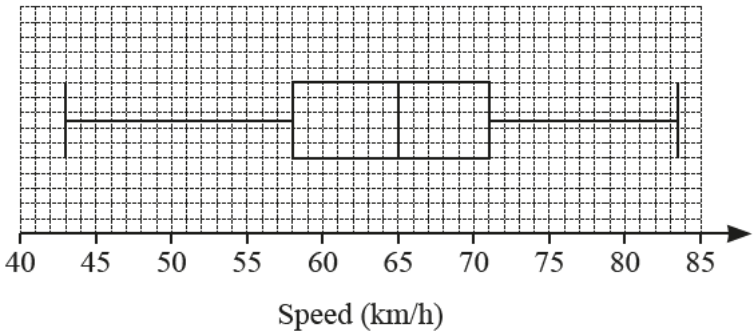
(ii) A histogram is drawn to show the information in the frequency table.
The height of the bar representing the interval $10 < h \leqslant 20$ is 7.2 cm.

Calculate the height of the bar representing the interval $30 < h \leqslant 50$.

..... cm [2]

13. Nov/2020/Paper_43/No.3

(a) The average speeds, in km/h, of cars travelling along a road are recorded.
The box-and-whisker plot shows this information.



Find

(i) the lowest speed recorded,

..... km/h [1]

(ii) the median,

..... km/h [1]

(iii) the interquartile range.

..... km/h [1]

(b) Another car takes 18 seconds to travel 400 m along this road.

Calculate the average speed of this car in km/h.

..... km/h [3]

14. March/2020/Paper_12/No.11

The number of people swimming in a pool is recorded each day for 12 days.

24	28	13	38	15	26
45	21	48	36	18	38

(a) Complete the stem-and-leaf diagram.

1	
2	
3	
4	

Key: 1|3 represents 13 swimmers

[2]

(b) Find the median number of swimmers.

..... [1]

15. March/2020/Paper_22/No.2

The number of people swimming in a pool is recorded each day for 12 days.

24	28	13	38	15	26
45	21	48	36	18	38

(a) Complete the stem-and-leaf diagram.

1	
2	
3	
4	

Key: 1|3 represents 13 swimmers

[2]

(b) Find the median number of swimmers.

..... [1]

16. March/2020/Paper_22/No.6

The table shows the marks scored by 40 students in a test.

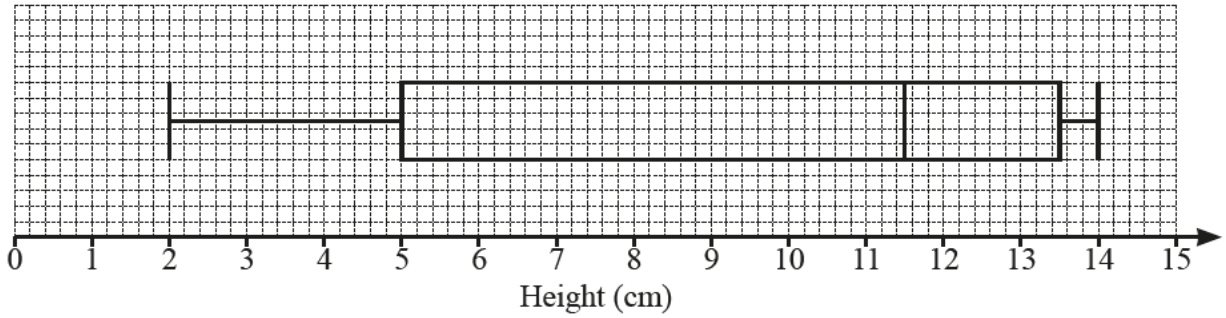
Mark	5	6	7	8	9	10
Frequency	8	5	11	7	5	4

Calculate the mean mark.

..... [3]

17. March/2020/Paper_22/No.14

The box-and-whisker plot gives information about the heights, in centimetres, of some plants.



(a) Write down the median.

..... cm [1]

(b) Find

(i) the range,

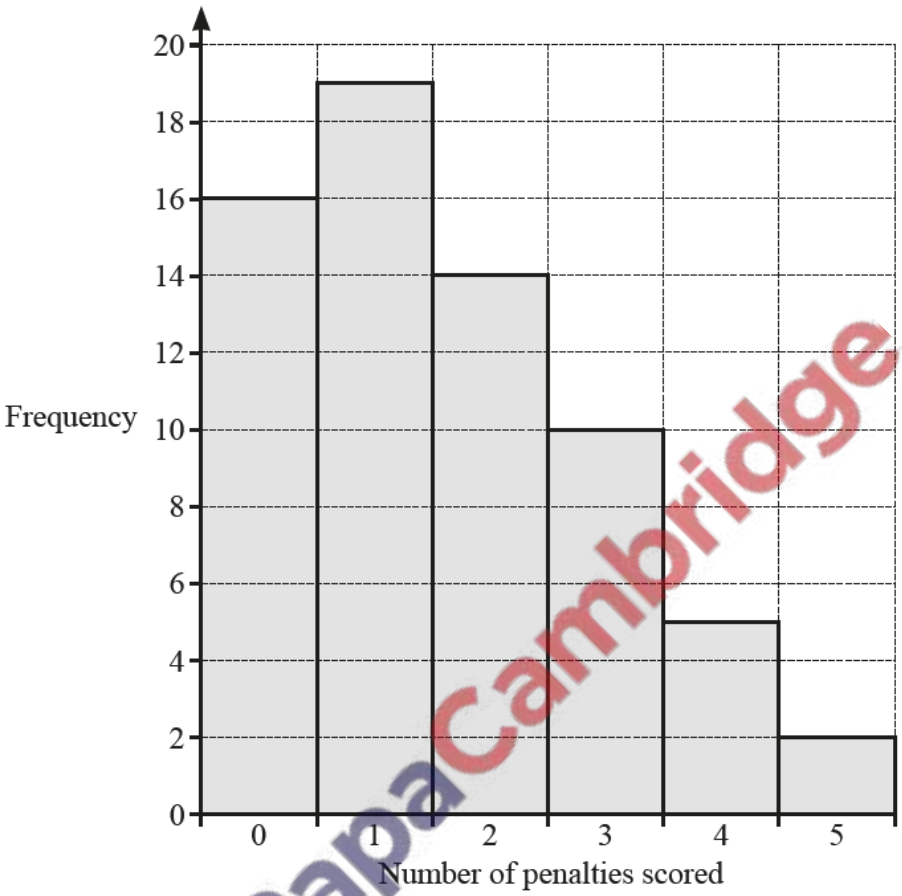
..... cm [1]

(ii) the interquartile range.

..... cm [1]

18. March/2020/Paper_32/No.2

(a) 66 football players each take five penalties.
The number of penalties that each player scores is recorded.
The results are shown in the bar chart.



(i) Write down the mode.

..... [1]

(ii) Write down the range.

..... [1]

(iii) Calculate the mean.

..... [3]

(b) The attendance at a football match is 11 678.

(i) Write 11 678 in words.

..... [1]

(ii) Write 11 678 correct to the nearest 100.

..... [1]

(c) In a football stadium there are 15 000 seats.
10 650 of these seats are occupied.

Find the percentage of the 15 000 seats that are occupied.

..... % [1]

(d) A ticket to a football match costs \$20.

Calculate the cost of the ticket in rupees when the exchange rate is 1 rupee = \$0.016 .

..... rupees [2]

19. June/2020/Paper_11/No.2

The table shows the temperature, in °C, at midday on the first day of each month during one year in a city.

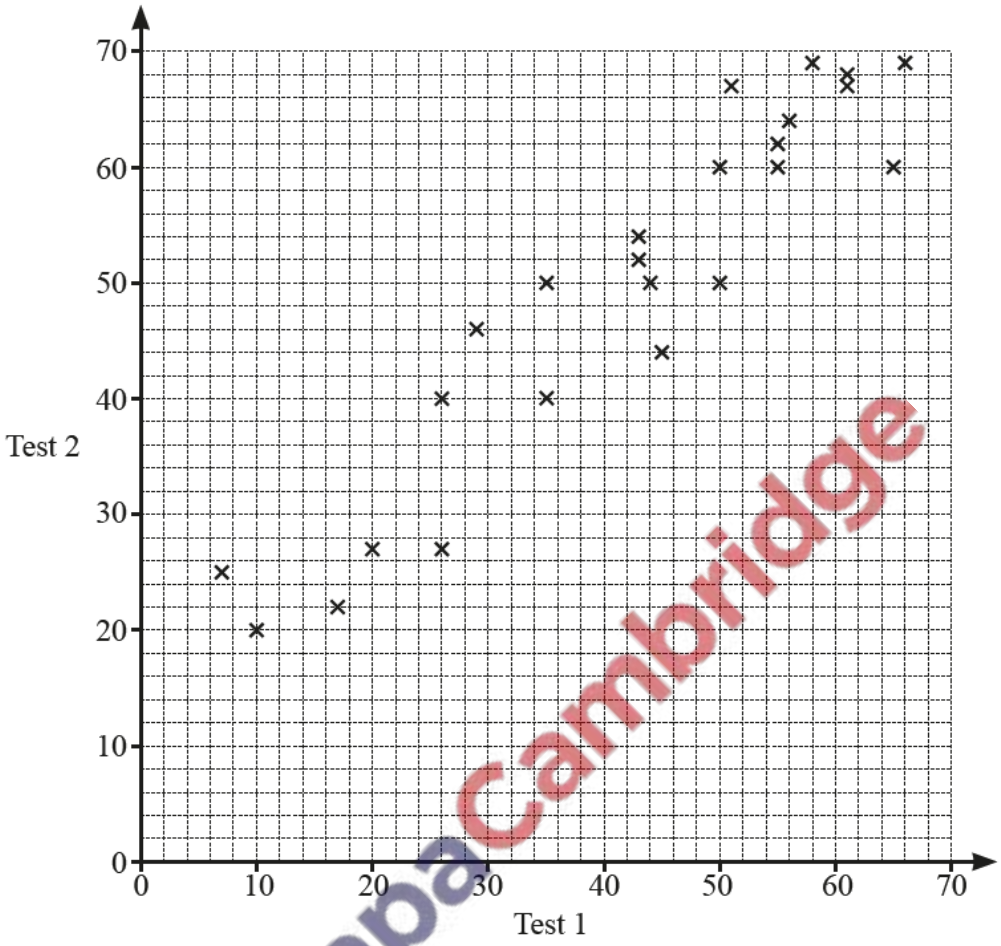
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
9	11	15	19	23.5	27.5	29	28	25	19.5	14.5	10

Calculate the mean of these temperatures.

..... °C [2]

20. June/2020/Paper_11/No.18

Mrs Salaman gives her class two mathematics tests.
The scatter diagram shows information about the marks each student scored.



(a) Write down the highest mark scored on test 1.

..... [1]

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

..... [1]

(c) Draw a line of best fit on the scatter diagram. [1]

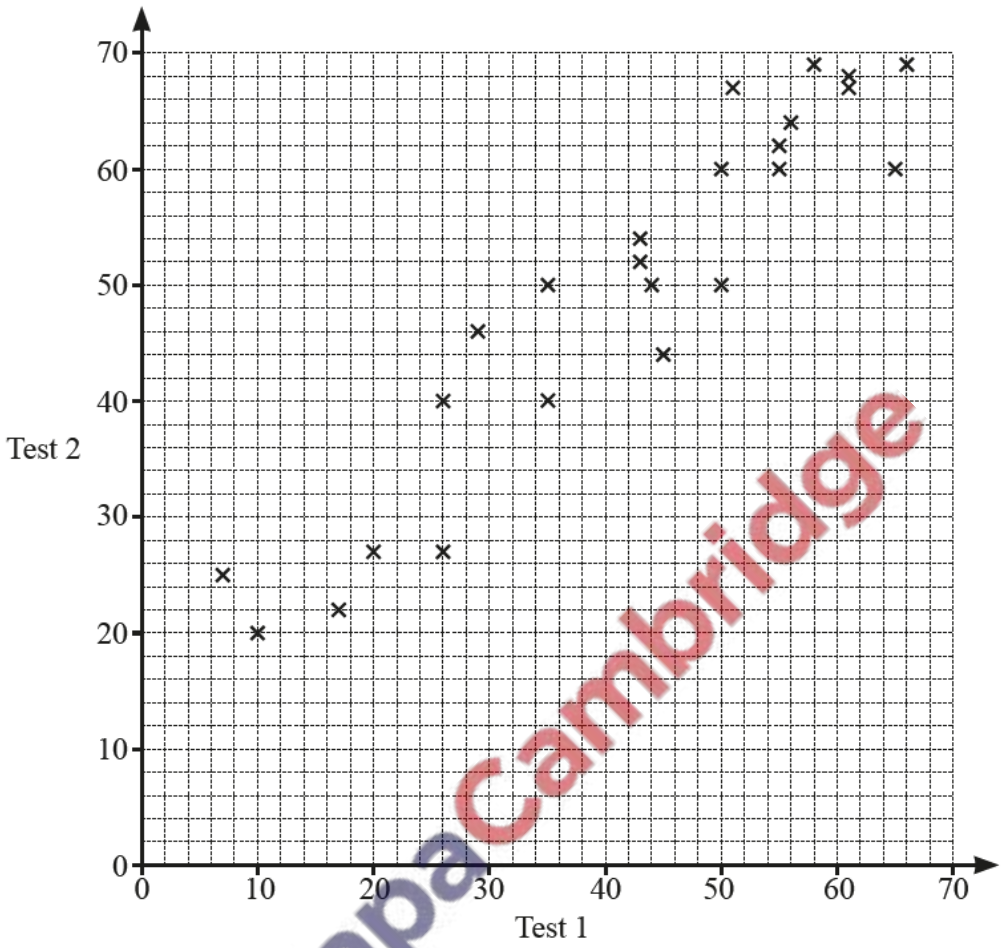
(d) Hamish scored a mark of 40 on test 1.
He was absent for test 2.

Use your line of best fit to find an estimate for his mark on test 2.

..... [1]

21. June/2020/Paper_21/No.3

Mrs Salaman gives her class two mathematics tests.
The scatter diagram shows information about the marks each student scored.



(a) Write down the highest mark scored on test 1.

..... [1]

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

..... [1]

(c) Draw a line of best fit on the scatter diagram. [1]

(d) Hamish scored a mark of 40 on test 1.
He was absent for test 2.

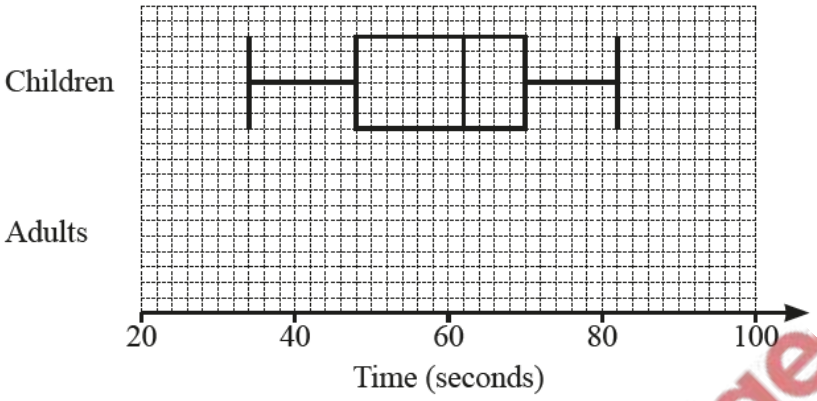
Use your line of best fit to find an estimate for his mark on test 2.

..... [1]

22. June/2020/Paper_21/No.12

Gemma records the times, in seconds, taken for a group of children and a group of adults to complete a puzzle.

The box-and-whisker plot shows information about the times taken for the children to complete the puzzle.



(a) Find the interquartile range of the times taken for the children to complete the puzzle.

..... seconds [2]

(b) The table shows some information about the times, in seconds, taken for the adults to complete the puzzle.

Minimum	Lower quartile	Median	Upper quartile	Maximum
28	42	58	70	75

On the grid above, draw the box-and-whisker plot for the adults. [2]

23. June/2020/Paper_23/No.15

The table shows the amount of money, $\$x$, given to a charity by each of 60 people.

Amount ($\$x$)	$0 < x \leqslant 20$	$20 < x \leqslant 25$	$25 < x \leqslant 35$	$35 < x \leqslant 50$	$50 < x \leqslant 100$
Frequency	21	16	6	10	7

Calculate an estimate of the mean.

$ ..... [4]

24. June/2020/Paper_31/No.7

(a) 20 students from College A each run 5 km.
The times, correct to the nearest minute, are recorded.

32	51	25	40	47	21	37	32	48	36
46	39	30	29	44	39	53	35	40	31

(i) Complete the stem-and-leaf diagram.

2	
3	
4	
5	

Key: 3 | 4 represents 34 minutes [2]

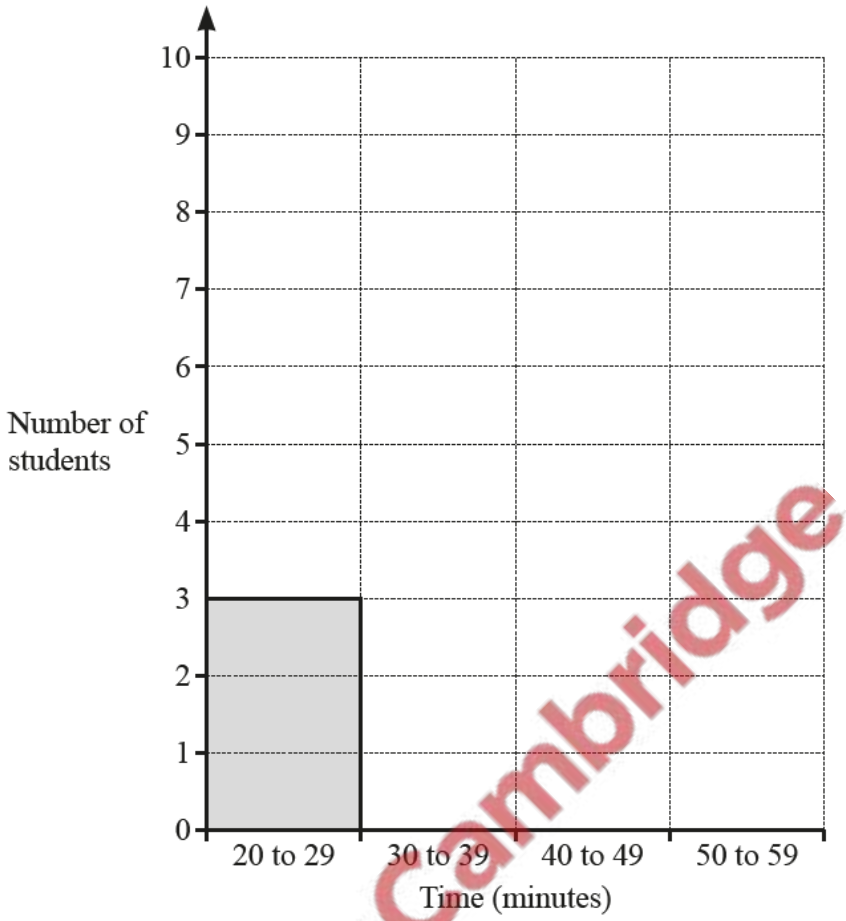
(ii) Find the range of the times.

..... min [1]

(iii) Find the median of the times.

..... min [1]

(iv) Complete the bar chart for the times of the students.

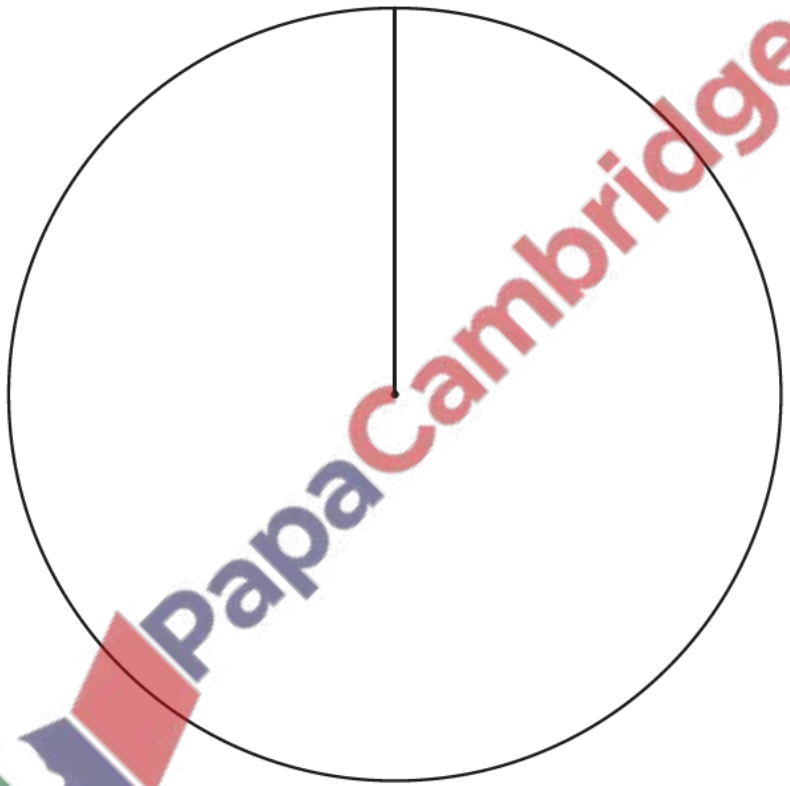


[2]

(b) 20 students from College B each run 5 km.
Their times, correct to the nearest minute, are recorded and the results are shown in the table.

Time (minutes)	Number of students	Pie chart sector angle
30 to 39	5	90°
40 to 49	8	
50 to 59	7	

(i) Complete the table. [2]



(ii) Complete the pie chart. [2]

(c) Write down two comments comparing the times of students from College A with the times of students from College B.

1 .....

.....

2 .....

..... [2]

25. June/2020/Paper_32/No.1b,1c

(b) Dina has a set of 12 cards.
These are the numbers on the cards.

3 4 1 3 2 1 3 4 2 2 1 3

Work out

(i) the median,

..... [2]

(ii) the mode,

..... [1]

(iii) the mean,

..... [2]

(iv) the range.

..... [1]

(c) Helena has a different set of cards.
She takes one card at random and records the number shown.
She does this 50 times.
The results are shown in the table.

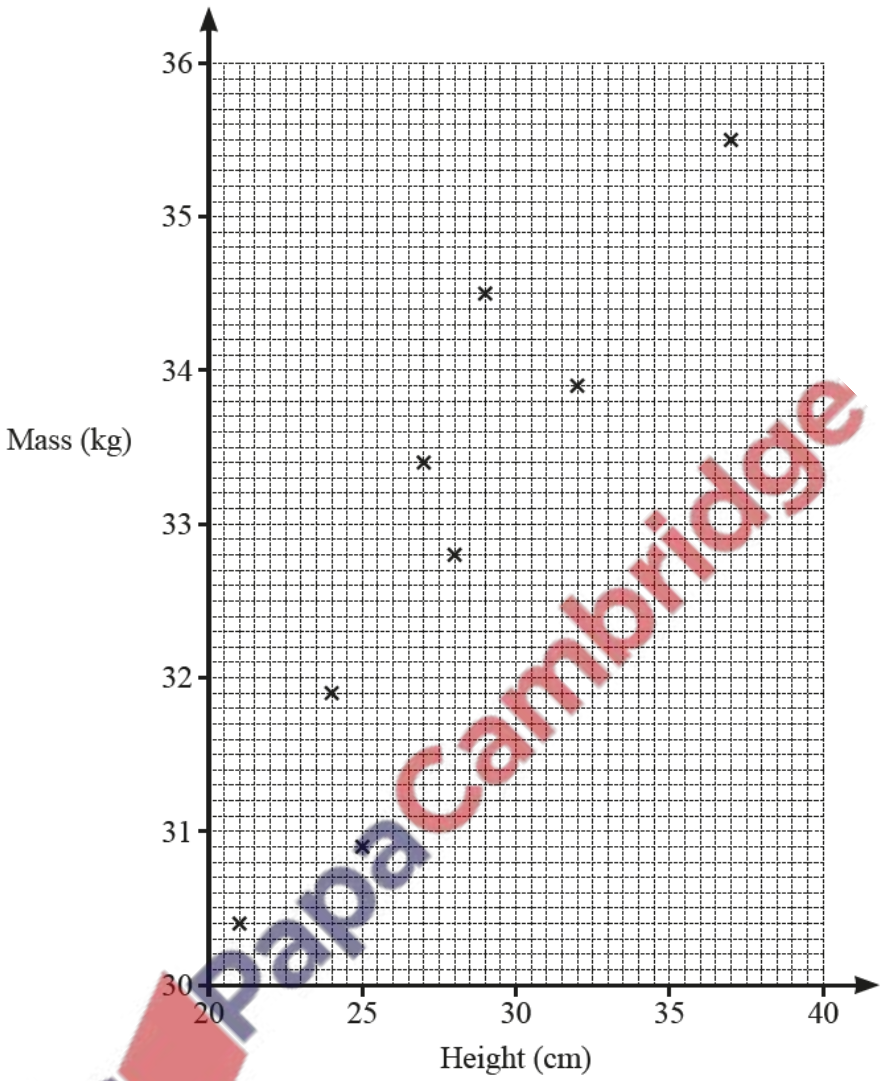
Number on card	Frequency
1	8
2	11
3	10
4	9
5	12

Calculate the mean of her results.

..... [3]

26. June/2020/Paper_32/No.3

Belle records the height, in centimetres, and the mass, in kilograms, of some goats.
Some of her results are shown in the scatter diagram.



(a) The table shows four more results.

Height (cm)	23	30	36	38
Mass (kg)	31.2	33.5	34.6	34.8

Plot these points on the scatter diagram. [2]

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

..... [1]

(c) **(i)** Draw a line of best fit on the scatter diagram. [1]

(ii) Use your line of best fit to estimate the height of a goat with mass 32.5 kg.

..... cm [1]

(d) Work out the percentage of the 12 goats that have a height between 26 cm and 35 cm.

..... % [3]

27. June/2020/Paper_33/No.5c

(c) Six of the students bring an apple to school one day.
The list shows the mass of each apple, correct to the nearest gram.

82 94 78 103 88 82

(i) Find

(a) the mode,

..... g [1]

(b) the range,

..... g [1]

(c) the median.

..... g [2]

(ii) Another student, Toni, also brings an apple to school.
The mean mass of the 7 apples is 89 g.

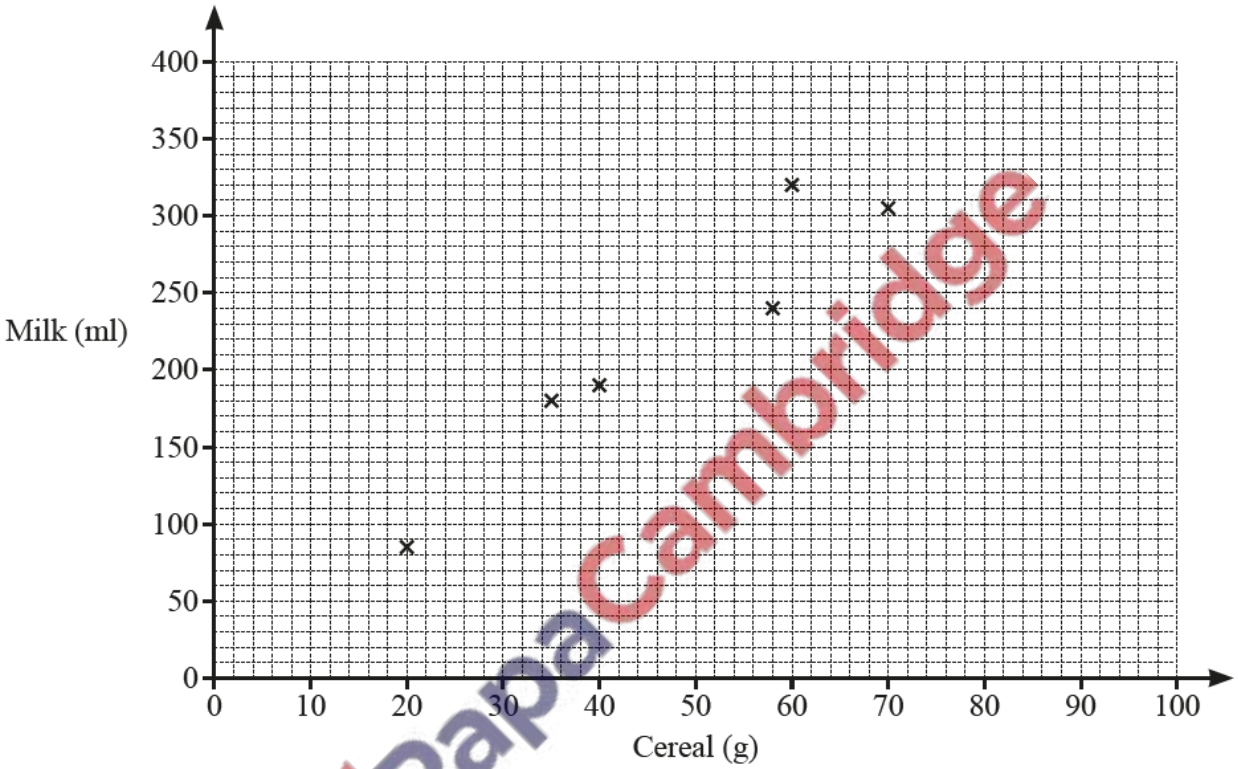
Work out the mass of Toni's apple.

..... g [3]

28. June/2020/Paper_33/No.6

(a) Ten students eat cereal with milk for breakfast.
The amounts are shown in the table.

Cereal (g)	40	20	58	70	60	35	28	40	55	46
Milk (ml)	190	85	240	305	320	180	150	230	340	220



(i) Complete the scatter diagram.
The first six points have been plotted for you. [2]

(ii) For these students, describe the relationship between the amount of cereal and the amount of milk.

..... [1]

(iii) On the grid, draw a line of best fit. [1]

(iv) Another student has 280 ml of milk with her cereal.

Use your line of best fit to estimate an amount of cereal this student has.

..... g [1]

(v) Explain why this scatter diagram should not be used to estimate the amount of milk for a student who has more than 70 g of cereal.

..... [1]

(b) 100 g of cereal contains 360 kilocalories.
100 ml of milk contains 45 kilocalories.
For breakfast Sasha has 35 g of cereal with 180 ml of milk.

Work out the number of kilocalories Sasha has for breakfast.

..... kcal [3]

(c) A shop sells cereal in boxes A, B and C.

NOT TO SCALE

Work out which box is the best value.
You must show all your working.

Box ..... [3]

29. June/2020/Paper_41/No.2

The heights, h metres, of the 120 boys in an athletics club are recorded.
The table shows information about the heights of the boys.

Height (h metres)	$1.3 < h \leqslant 1.4$	$1.4 < h \leqslant 1.5$	$1.5 < h \leqslant 1.6$	$1.6 < h \leqslant 1.7$	$1.7 < h \leqslant 1.8$	$1.8 < h \leqslant 1.9$
Frequency	7	18	30	24	27	14

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

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

(ii) Calculate an estimate of the mean height.

..... m [4]

(b) (i) One boy is chosen at random from the club.

Find the probability that this boy has a height greater than 1.8 m.

..... [1]

(ii) Three boys are chosen at random from the club.

Calculate the probability that one of the boys has a height greater than 1.8 m and the other two boys each have a height of 1.4 m or less.

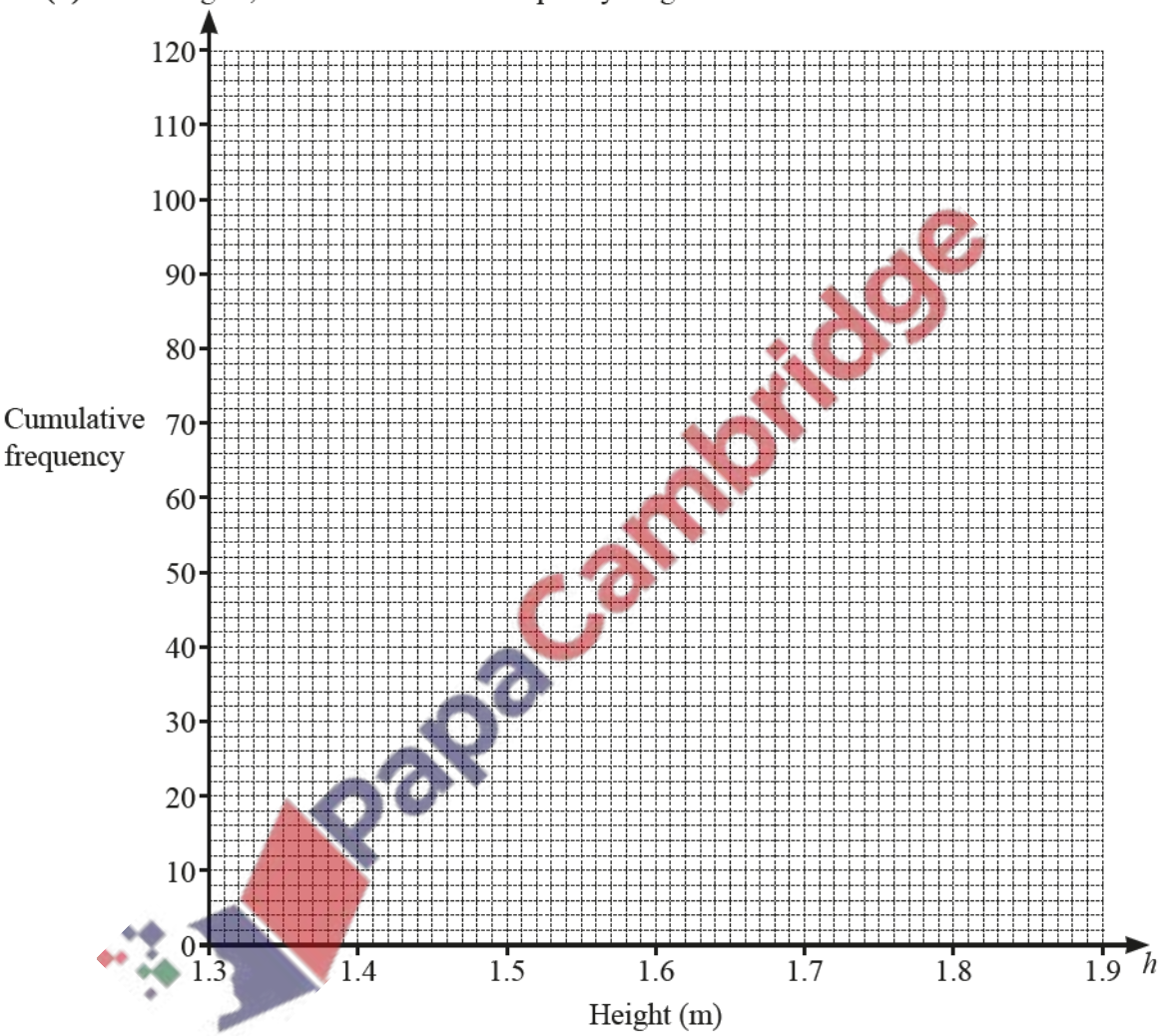
..... [4]

(c) (i) Use the frequency table on page 4 to complete the cumulative frequency table.

Height (h metres)	$h \leqslant 1.4$	$h \leqslant 1.5$	$h \leqslant 1.6$	$h \leqslant 1.7$	$h \leqslant 1.8$	$h \leqslant 1.9$
Cumulative frequency	7	25				

[2]

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



[3]

(d) Use your diagram to find an estimate for

(i) the median height,

..... m [1]

(ii) the 40th percentile.

..... m [2]

30. June/2020/Paper_42/No.3

The speed, $v$km/h, of each of 200 cars passing a building is measured.
The table shows the results.

Speed ($v$km/h)	$0 < v \leqslant 20$	$20 < v \leqslant 40$	$40 < v \leqslant 45$	$45 < v \leqslant 50$	$50 < v \leqslant 60$	$60 < v \leqslant 80$
Frequency	16	34	62	58	26	4

(a) Calculate an estimate of the mean.

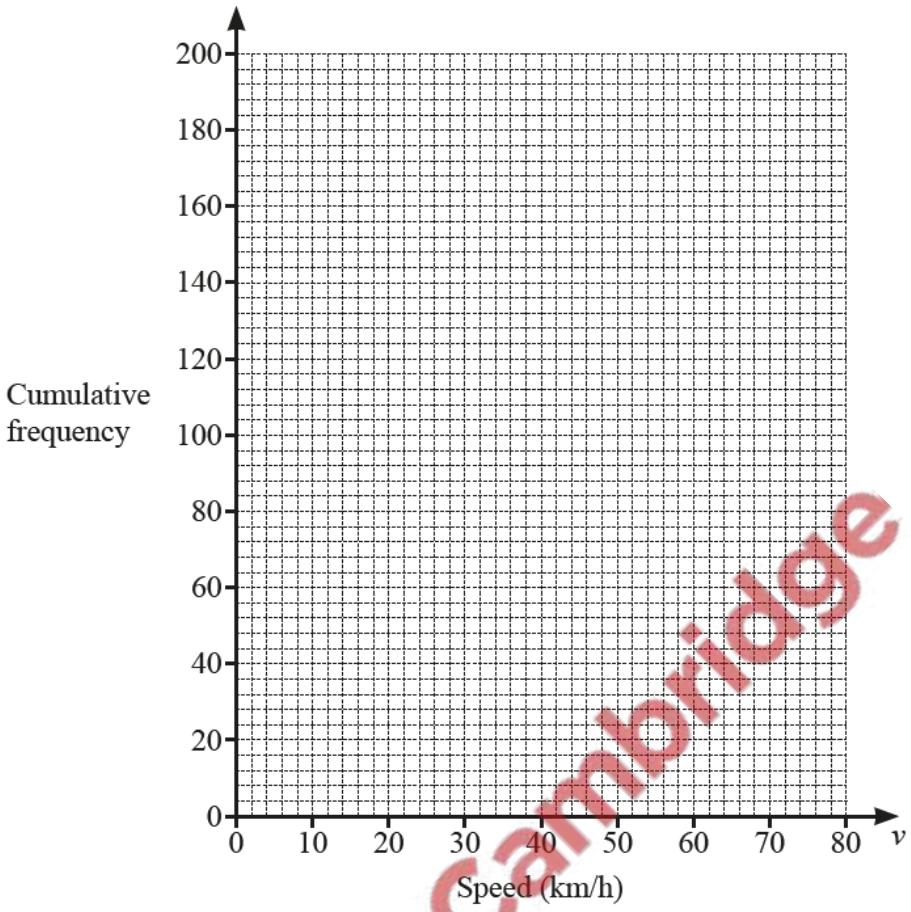
..... km/h [4]

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

Speed ($v$km/h)	$v \leqslant 20$	$v \leqslant 40$	$v \leqslant 45$	$v \leqslant 50$	$v \leqslant 60$	$v \leqslant 80$
Cumulative frequency	16	50			196	200

[1]

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



[3]

(iii) Use your diagram to find an estimate of

(a) the upper quartile,

..... km/h [1]

(b) the number of cars with a speed greater than 35 km/h.

..... [2]

(c) Two of the 200 cars are chosen at random.

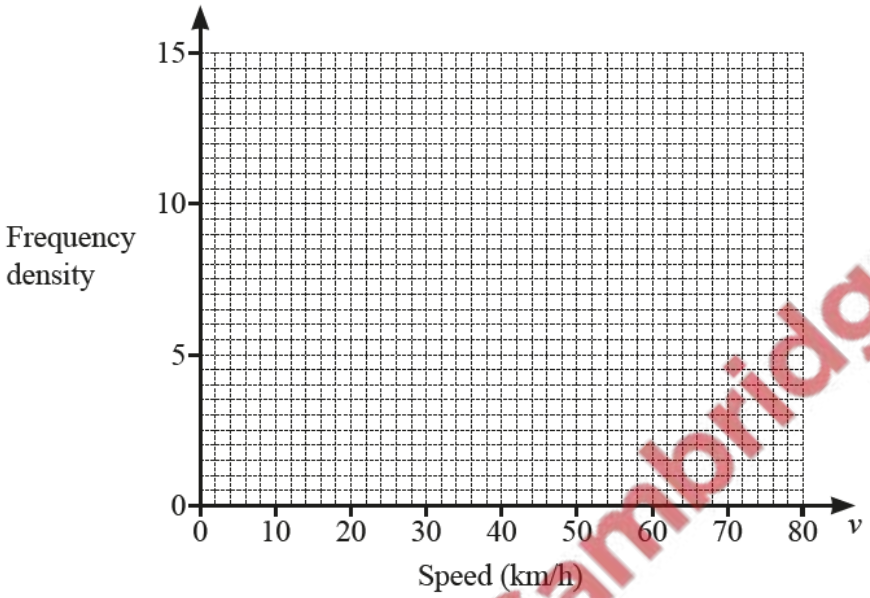
Find the probability that they both have a speed greater than 50 km/h.

..... [2]

(d) A new frequency table is made by combining intervals.

Speed (v km/h)	$0 < v \leqslant 40$	$40 < v \leqslant 50$	$50 < v \leqslant 80$
Frequency	50	120	30

On the grid, draw a histogram to show the information in this table.



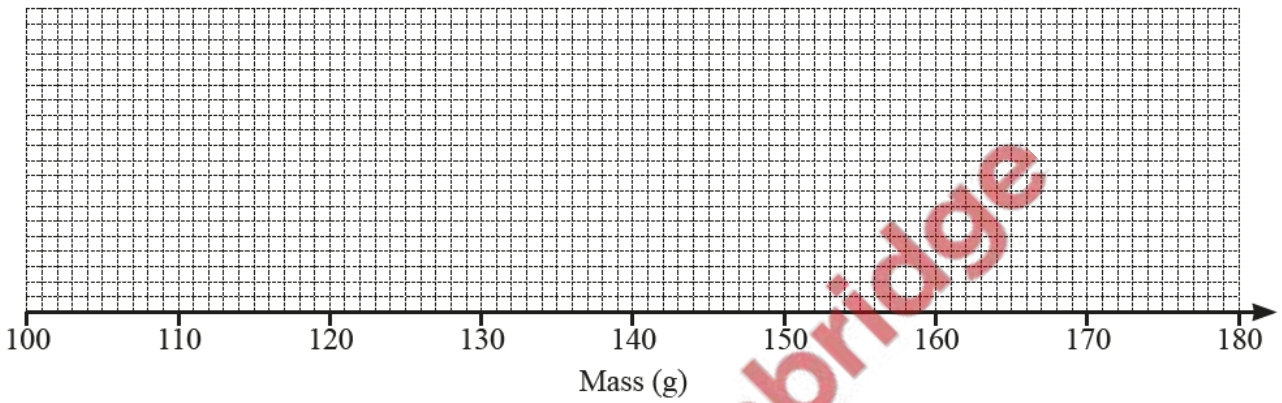
[3]

31. June/2020/Paper_43/No.3

(a) Here is some information about the masses of potatoes in a sack:

- The largest potato has a mass of 174 g.
- The range is 69 g.
- The median is 148 g.
- The lower quartile is 121 g.
- The interquartile range is 38 g.

On the grid below, draw a box-and-whisker plot to show this information.



[4]

(b) The table shows the marks scored by some students in a test.

Mark	5	6	7	8	9	10
Frequency	8	2	12	2	0	1

Calculate the mean mark.

.....

[3]