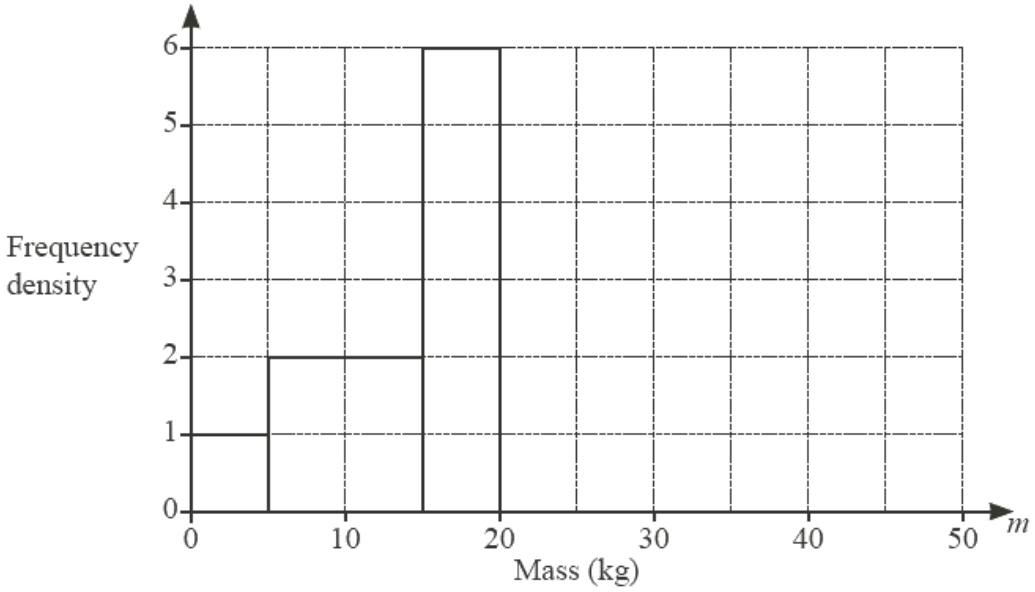
Statistics – 2022 O Level Math D 4024

1. Nov/2022/Paper_4024/11/No.20

A farmer records the mass of each of his sheep.
Some of the results are summarised in the table and illustrated in the histogram.

Mass (m kg)	$0 < m \leqslant 5$	$5 < m \leqslant 15$	$15 < m \leqslant 20$	$20 < m \leqslant 30$	$30 < m \leqslant 50$
Frequency	5	20	a	40	20



(a) Use the histogram to find the value of a.

$a =$ ..... [1]

(b) Complete the histogram. [2]

2. Nov/2022/Paper_4024/12/No.20

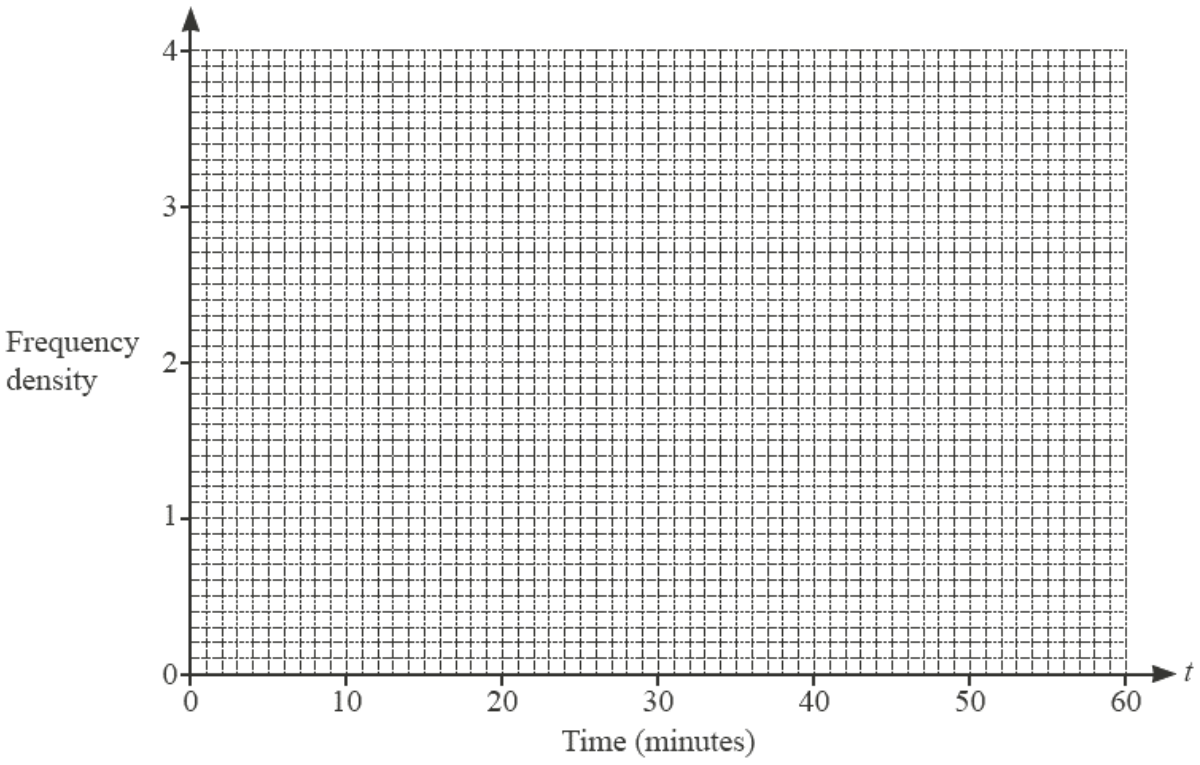
The table shows some information about the times each of 100 children spent reading in one day.

Time (t mins)	$x < t \leqslant 30$	$30 < t \leqslant 40$	$40 < t \leqslant 45$	$45 < t \leqslant 60$
Frequency	32	23	15	30
Frequency density	1.6	2.3		

(a) Find the value of x in the interval $x < t \leqslant 30$.

$x =$ ..... [1]

(b) On the grid, draw a histogram to represent the data for the 100 children.

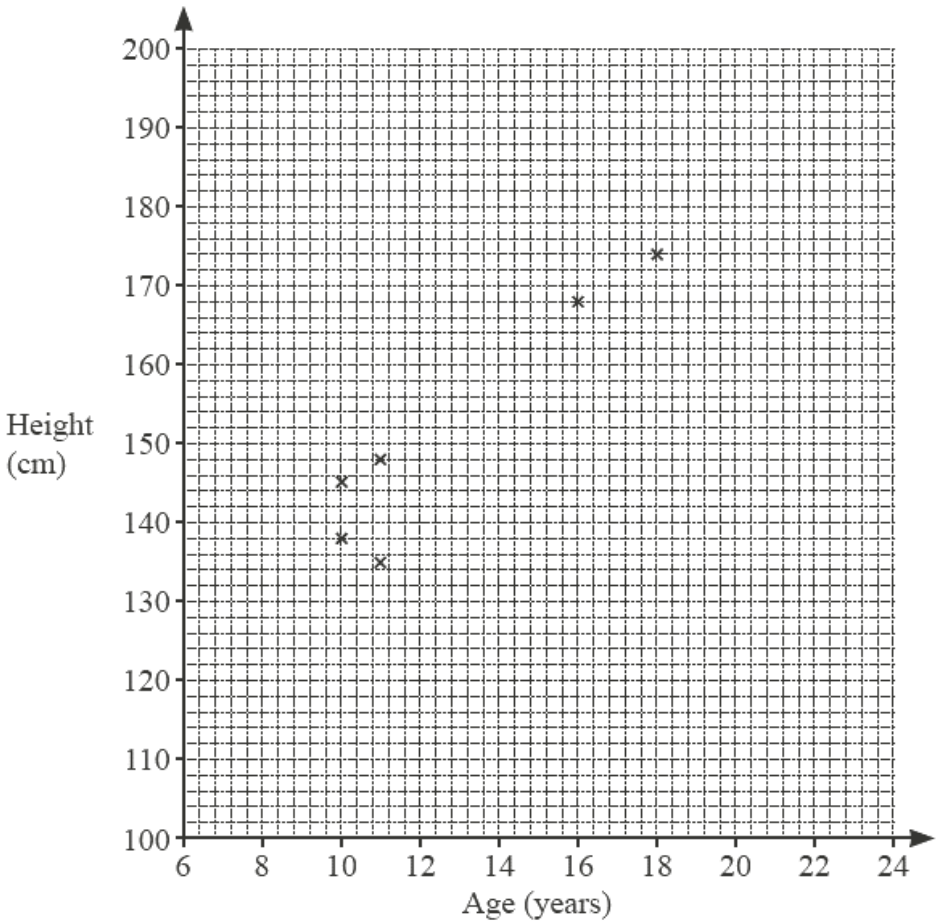


[3]

3. Nov/2022/Paper_4024/21/No.2

(a) The table shows the ages and heights of 10 boys.

Age (years)	10	16	11	18	10	11	13	17	13	16
Height (cm)	138	168	135	174	145	148	158	175	150	160



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

(ii) Draw a line of best fit. [1]

(iii) Use your line of best fit to estimate the height of a 14-year-old boy.

..... cm [1]

(iv) Simon is 22 years old.

Explain why your line of best fit should not be used to estimate his height.

.....

..... [1]

(b) The table summarises the heights of 180 girls in Year 7 of a school.

Height (h cm)	$125 < h \leqslant 135$	$135 < h \leqslant 140$	$140 < h \leqslant 145$	$145 < h \leqslant 150$	$150 < h \leqslant 160$
Frequency	8	31	55	62	24

(i) Work out the percentage of girls who are taller than 145 cm.

..... % [2]

(ii) Calculate an estimate of the mean height.

..... cm [3]

4. Nov/2022/Paper_4024/22/No.2

(a) Marco grows two types of tomato plants, type A and type B.
He counts the number of tomatoes growing on each tomato plant.

The results for type A plants are shown in the table.

Number of tomatoes on plant	17	18	19	20	21	22
Frequency	5	2	7	3	2	1

(i) Calculate the mean number of tomatoes per plant.

..... [2]

(ii) Calculate the range.

..... [1]

(iii) The mean number of tomatoes per plant for type B plants is 17.1 and the range is 8.

Make two comments comparing the number of tomatoes growing on type A and type B plants.

1 .....

.....

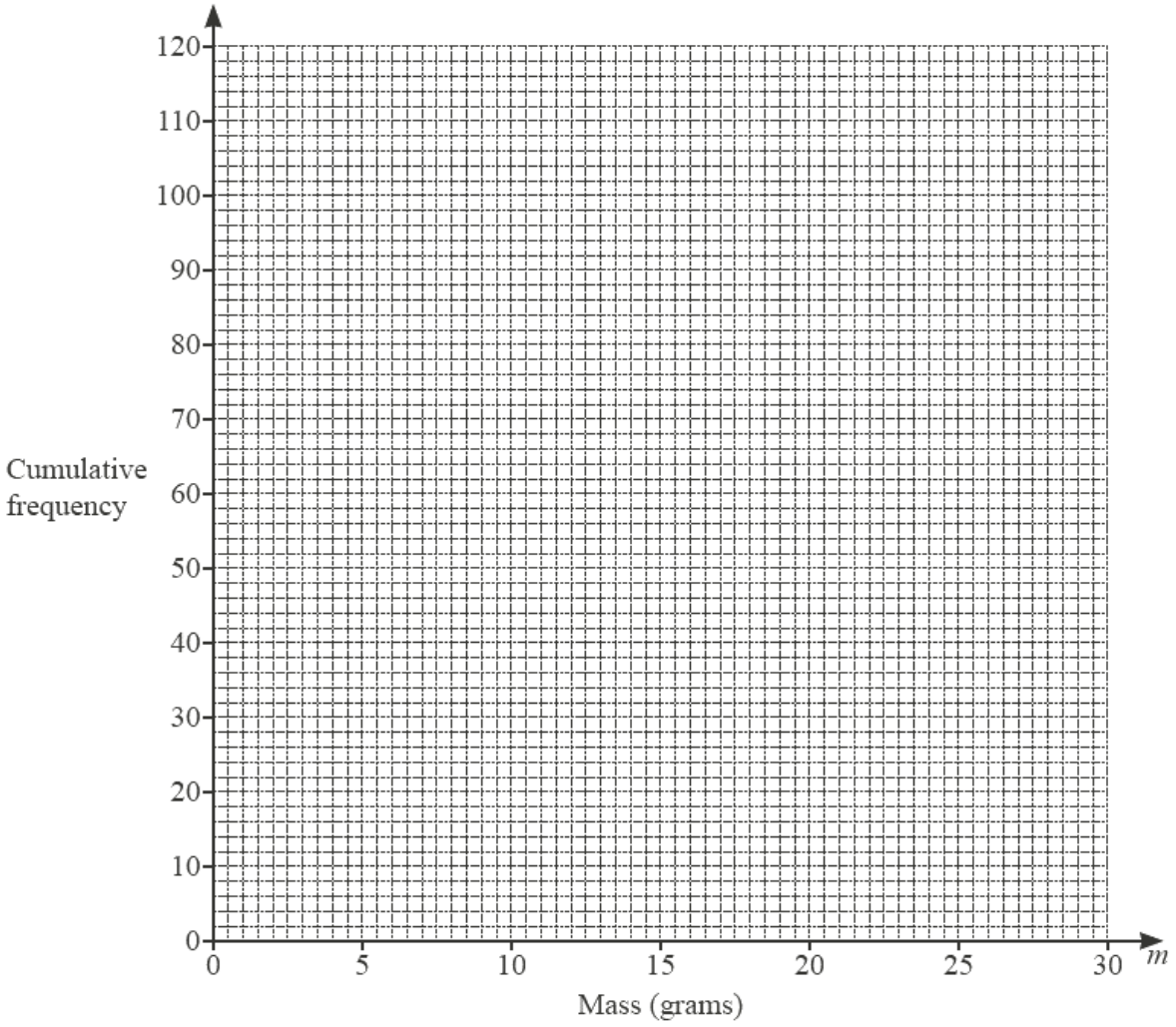
2 .....

..... [2]

(b) Marco also grows strawberries.
He records the masses, m grams, of 120 of his strawberries.
The frequency table shows the results.

Mass (m grams)	$5 < m \leqslant 10$	$10 < m \leqslant 15$	$15 < m \leqslant 20$	$20 < m \leqslant 25$	$25 < m \leqslant 30$
Frequency	15	38	45	17	5

(i) Draw a cumulative frequency diagram to represent these results.



[3]

(ii) Marco uses strawberries with a mass greater than 21 grams to make jam.

Use your diagram to find an estimate for the percentage of strawberries he uses to make jam.

..... % [3]

5. June/2022/Paper_4024/11/No.7

20 students were asked how many pets they owned.
The responses are shown in the table.

Number of pets	0	1	2	3	4	5
Frequency	3	8	3	4	0	2

(a) Find the median number of pets.

..... [1]

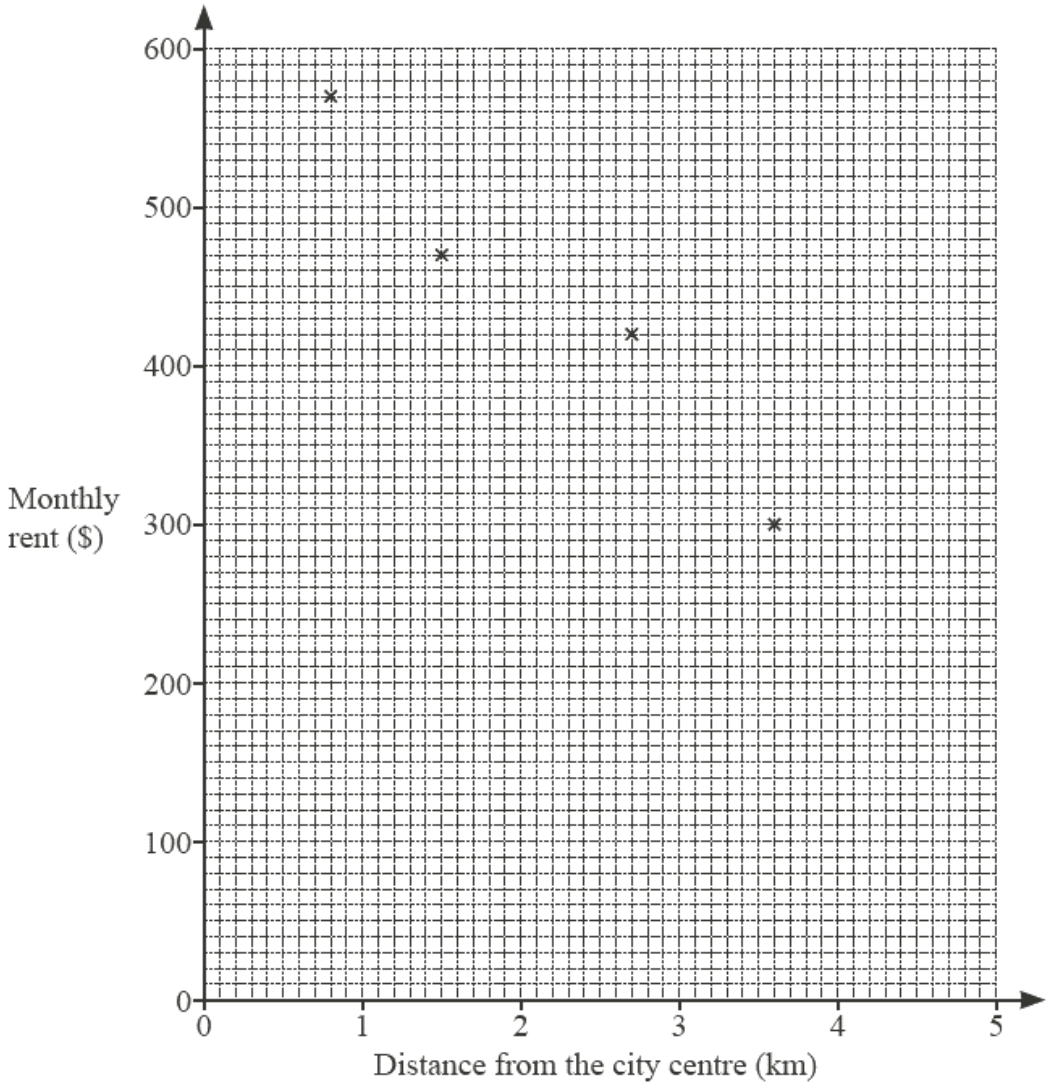
(b) Calculate the mean number of pets.

..... [2]

6. June/2022/Paper_4024/11/No.10

The table below shows the monthly rent for nine apartments and the distance of these apartments from the city centre.

Distance from the city centre (km)	0.8	1.5	2.7	3.6	2.0	4.3	2.3	3.0	1.0
Monthly rent ($)	570	470	420	300	480	270	390	360	530



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

(b) What type of correlation is shown on 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 the monthly rent for an apartment which is 4 km from the city centre.

$ ..... [1]

7. June/2022/Paper_4024/12/No.2

Asha asks a group of students about their favourite fruit.
The table and pictogram show some of the results.

Fruit	Apple	Banana	Orange	Melon
Frequency	8		5	

Apple	
Banana	
Orange	
Melon	

Key:  represents 4 people

(a) Complete the table and pictogram. [3]

(b) Write down the mode.

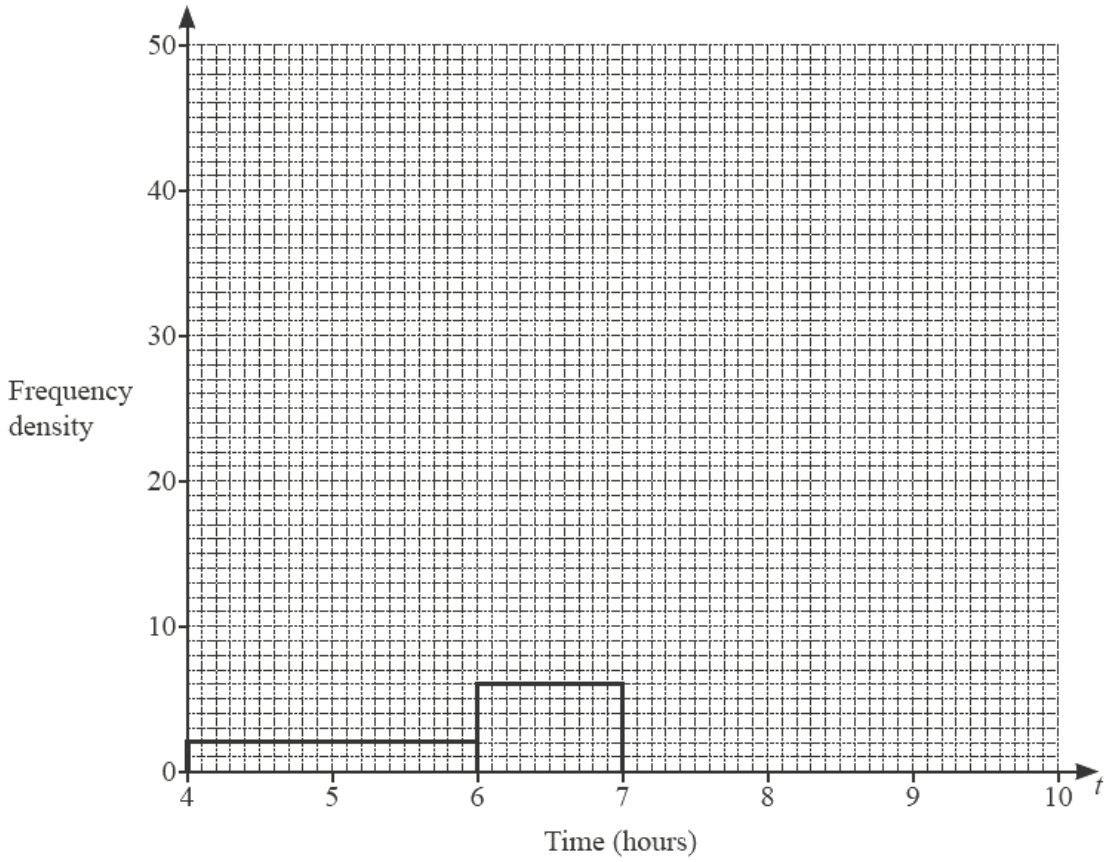
..... [1]

8. June/2022/Paper_4024/21/No.7(b)

(b) Yasir records the length of time he spends at work on each of 70 work days.
The table shows the results.

Time (t hours)	$4 < t \leqslant 6$	$6 < t \leqslant 7$	$7 < t \leqslant 7\frac{1}{2}$	$7\frac{1}{2} < t \leqslant 8$	$8 < t \leqslant 8\frac{3}{4}$	$8\frac{3}{4} < t \leqslant 10$
Frequency	4	6	9	23	18	10

(i) Complete the histogram to represent the data.



[3]

(ii) Yasir starts work each day at 9.00 a.m.
He is paid overtime if he works later than 5.15 p.m.

Estimate the number of days he is paid overtime during these 70 work days.

..... [2]

9. June/2022/Paper_4024/22/No.3(a)

A 5-sided spinner is numbered 1, 2, 3, 4 and 5.
The table shows the results from spinning the spinner 200 times.

Number	Frequency
1	51
2	19
3	28
4	35
5	67

(a) A pie chart is drawn to show this information.

Calculate the angle of the sector representing the number 4.

..... [2]

10. June/2022/Paper_4024/22/No.5

(a) A group of students each complete a puzzle.
The table shows the time, t seconds, each student took to complete the puzzle.

Time (t seconds)	$80 < t \leqslant 120$	$120 < t \leqslant 140$	$140 < t \leqslant 150$	$150 < t \leqslant 240$
Frequency	13	26	27	24

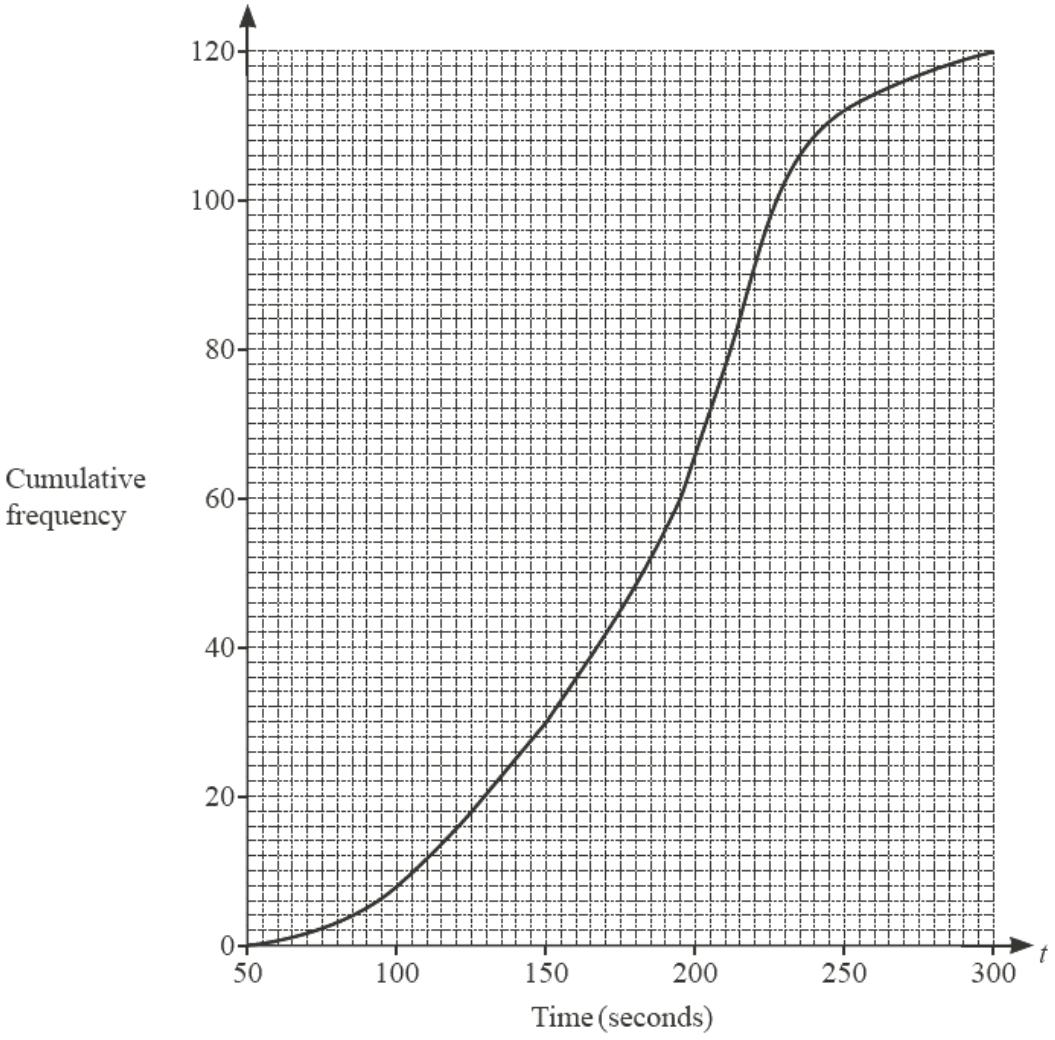
(i) Find the number of students who took 2 minutes 20 seconds or less to complete the puzzle.

..... [1]

(ii) Calculate an estimate of the mean time taken, in seconds, to complete the puzzle.

..... s [3]

(b) A group of adults also completed this puzzle.
A cumulative frequency diagram for their times is shown.



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

Time (t seconds)	$50 < t \leqslant 100$	$100 < t \leqslant 150$	$150 < t \leqslant 200$	$200 < t \leqslant 250$	$250 < t \leqslant 300$
Frequency	8				

[2]

(ii) Use the cumulative frequency diagram to find an estimate of the median.

..... s [1]

(iii) 55% of the adults took between 125 seconds and k seconds to complete the puzzle.

Use the cumulative frequency diagram to find the value of k.

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