Statistics – 2023 O Level Math D 4024
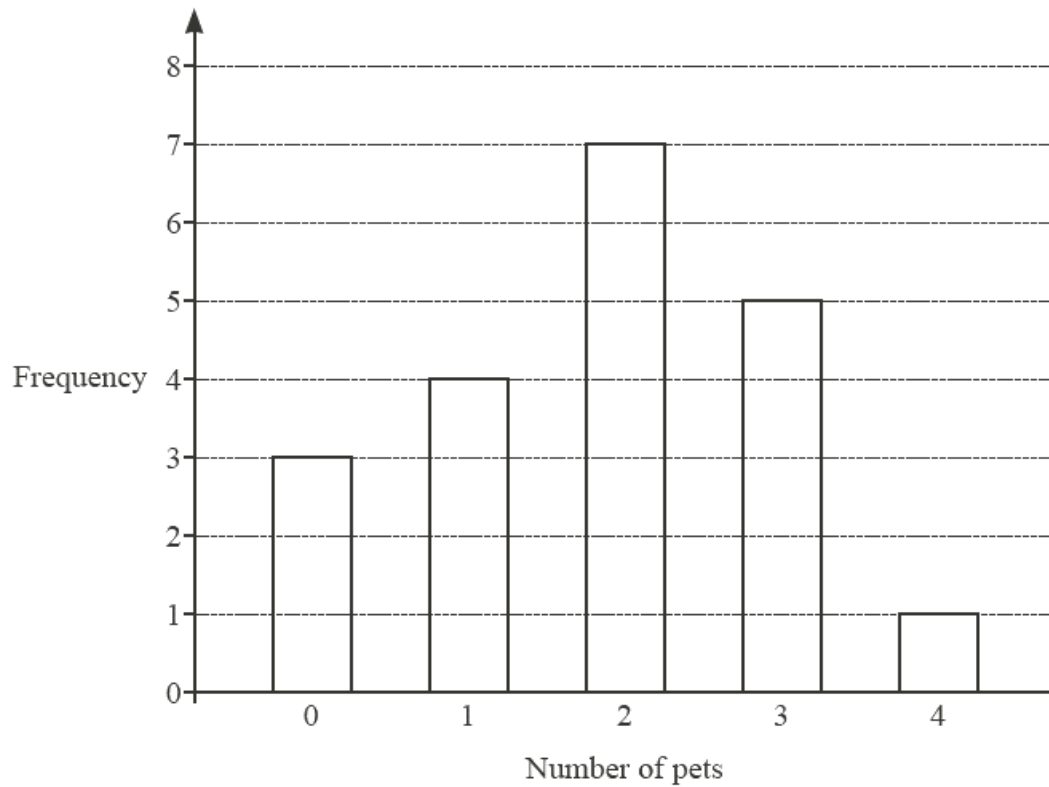
1. Nov/2023/Paper_ 4024/11/No.5

Yasmin asks 20 people how many pets they own.
The results are shown in the bar chart.

(a) Find the range.
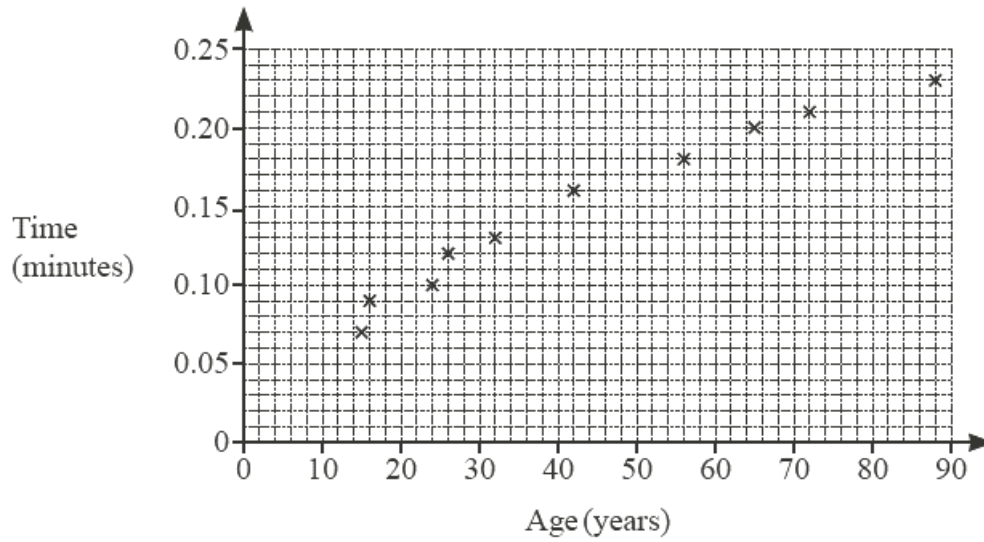
.... [1]

(b) Find the fraction of the 20 people who own 3 pets.

.... [1]

2. Nov/2023/Paper_ 4024/11/No.9

The scatter diagram shows the ages of ten people and the time they each take to complete a task.

(a) Write down the type of correlation shown on the scatter diagram.

.... [1]

(b) By drawing a line of best fit, estimate the time taken by a person aged 50 to complete the task.

.... minutes [2]

2

3. Nov/2023/Paper_ 4024/12/No.4

Sonu records the temperature, in °C, at midnight every day for 12 days.
Here are the results in order, starting with the coldest.

$$-6 \qquad -5 \qquad -3 \qquad -2 \qquad -1 \qquad -1 \qquad T \qquad 5 \qquad 5 \qquad 6 \qquad 6 \qquad 7$$

(a) Find the range of the temperatures.

.... °C [1]

(b) The median temperature is 1°C.

Find the value of T.

$T =$ .... [1]

4. Nov/2023/Paper_ 4024/12/No.13

A list of eight numbers has a mean of 12.
The first five numbers have a mean of 9.

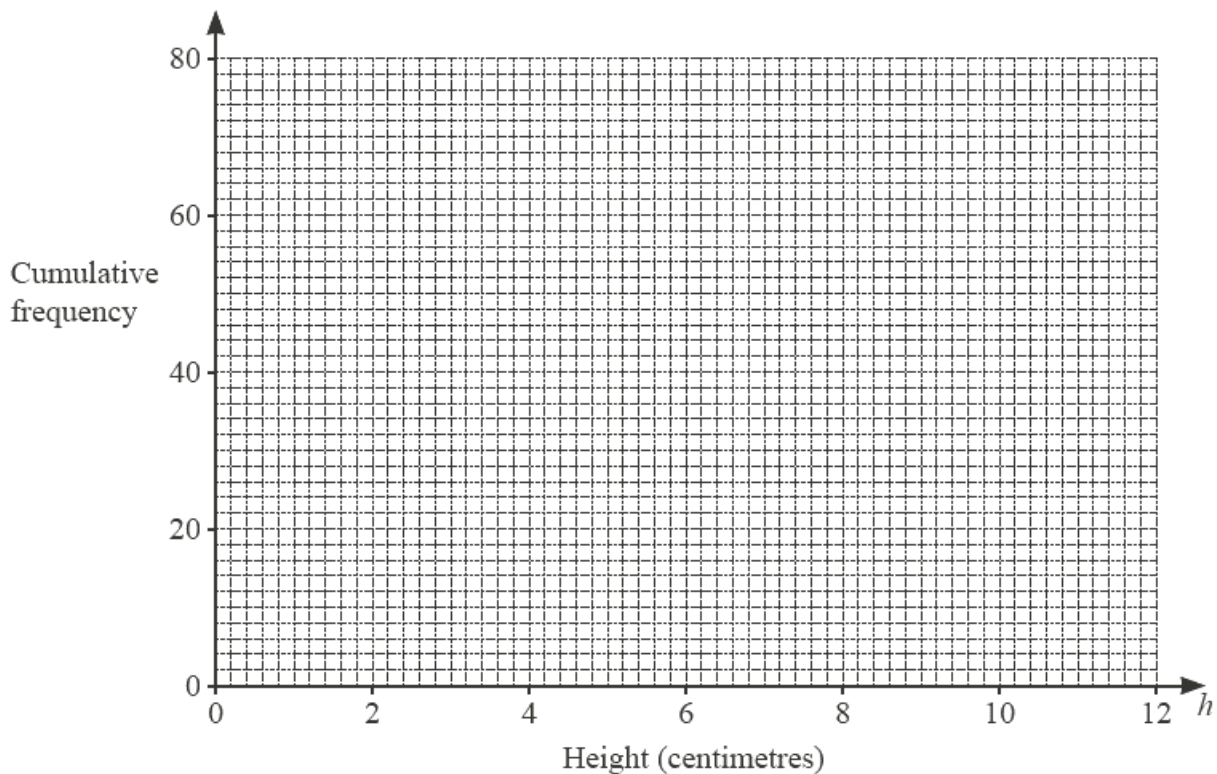Find the sum of the three remaining numbers.

.... [2]

5. Nov/2023/Paper_ 4024/12/No.17

The heights of 80 plants are measured.
The table shows the results.

Height (h centimetres)	$h \leqslant 2$	$h \leqslant 4$	$h \leqslant 6$	$h \leqslant 8$	$h \leqslant 10$	$h \leqslant 12$
Cumulative frequency	4	18	42	60	72	80

(a) Draw a cumulative frequency diagram to show this information.

[2]

(b) Use your diagram to find an estimate for the interquartile range.

.... cm [2]

(c) Plants are sold when they are taller than H centimetres.
28 of these plants are sold.

Find the value of H.

$H =$ .... [2]

4

6. Nov/2023/Paper_ 4024/21/No.5(b)

This is part of a bus timetable.

Town square	06 30	06 50	07 10	07 35	07 45
Railway station	06 48	07 08	07 28	07 53	08 03
Business park	07 16	07 36	07 56	08 21	08 31
Airport	07 35	07 55	08 15	08 40	08 50

(b) 160 workers at the business park are asked the time taken, in minutes, for their journey to work. The results are shown in the cumulative frequency diagram.
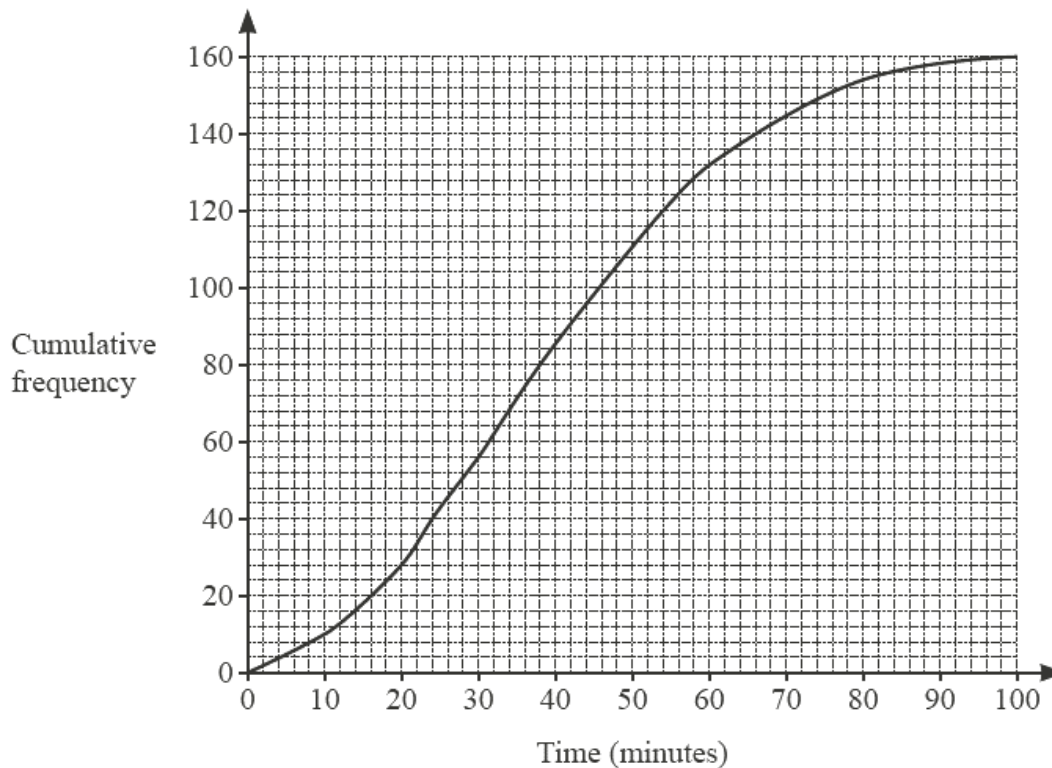
Use the diagram to estimate

(i) the number of workers whose journey took less than 30 minutes

.... [1]

(ii) the interquartile range

.... minutes [2]

(iii) the percentage of workers whose journey took longer than 1 hour.

.... % [3]

7. Nov/2023/Paper_ 4024/21/No.8

(a) A group of 40 children are each asked how many books they read last month.
The table shows the results.

Number of books	0	1	2	3	4	5
Frequency	7	11	9	5	6	2

(i) Write down the mode.

.... [1]

(ii) Find the median.

.... [1]

(iii) Calculate the mean.

.... [2]

(iv) One of the 40 children is chosen at random.

Find the probability that this child read 4 or more books.
Give your answer as a fraction in its simplest form.

.... [2]

(b) There are 10 books on a shelf.
7 of the books are fiction and 3 are non-fiction.

    (i) Sanjay takes a book from the shelf at random, looks at it and replaces it.
He then takes another book from the shelf at random, looks at it and replaces it.

    Find the probability that one book is fiction and the other book is non-fiction.

.... [2]

    (ii) Mona takes 3 books from the 10 books on the shelf at random without replacement.

    Find the probability that only one of the books she takes is fiction.

.... [3]

8. Nov/2023/Paper_ 4024/22/No.3

(a) Laila asks a group of people what type of exercise they prefer.
The results are shown in the pie chart.

(i) 90 people prefer running.
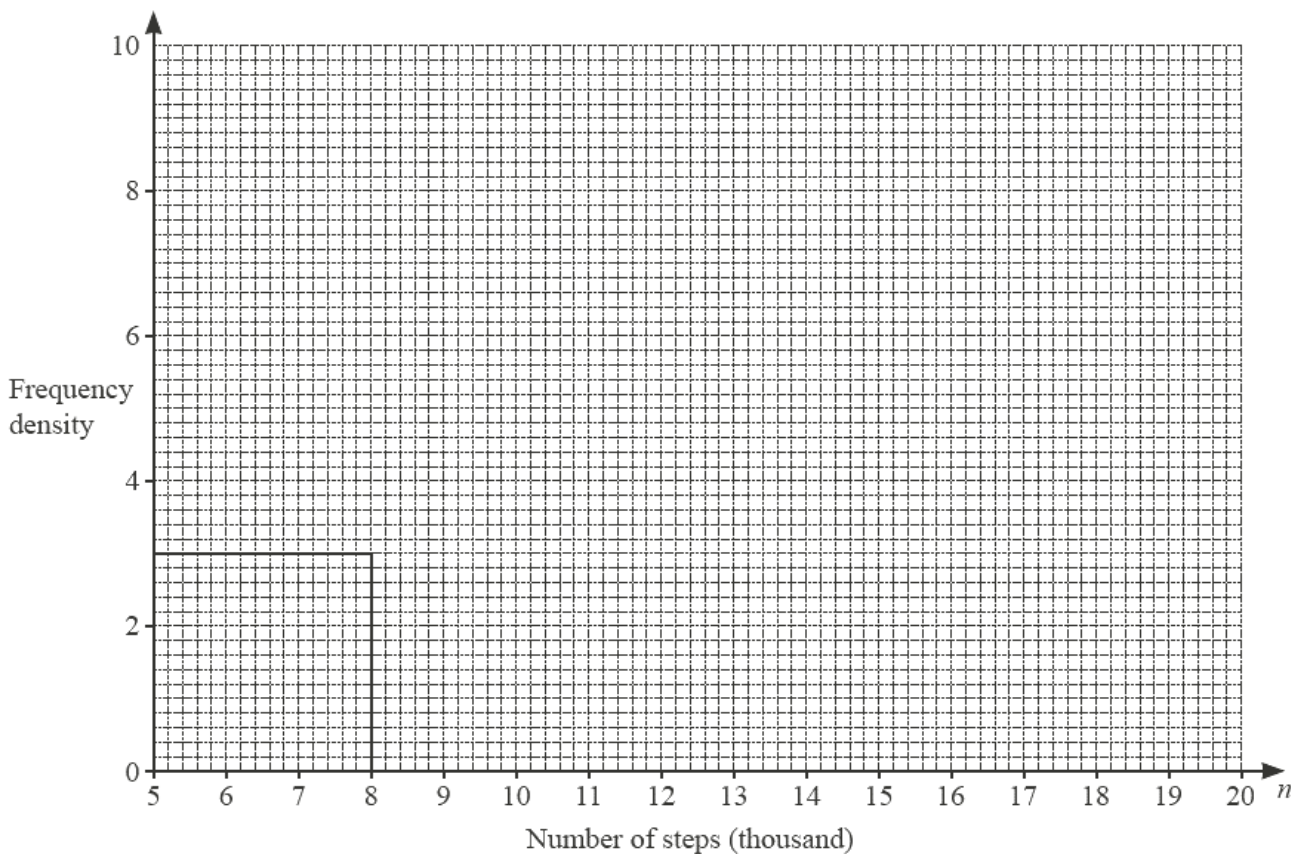
Calculate the total number of people Laila asks.

.... [2]

(ii) Work out the fraction of the group who prefer yoga.
Write your answer in its simplest form.

.... [2]

(b) Laila records the number of steps she walks each day for 60 days.
The table shows the results.

Number of steps (n thousand)	$5 < n \leqslant 8$	$8 < n \leqslant 10$	$10 < n \leqslant 12$	$12 < n \leqslant 15$	$15 < n \leqslant 20$
Frequency	9	16	14	15	6

(i) Complete the histogram to represent the data.

[3]

(ii) Laila has a target of 11 000 steps every day.

Find an estimate for the percentage of these 60 days that Laila met her target.

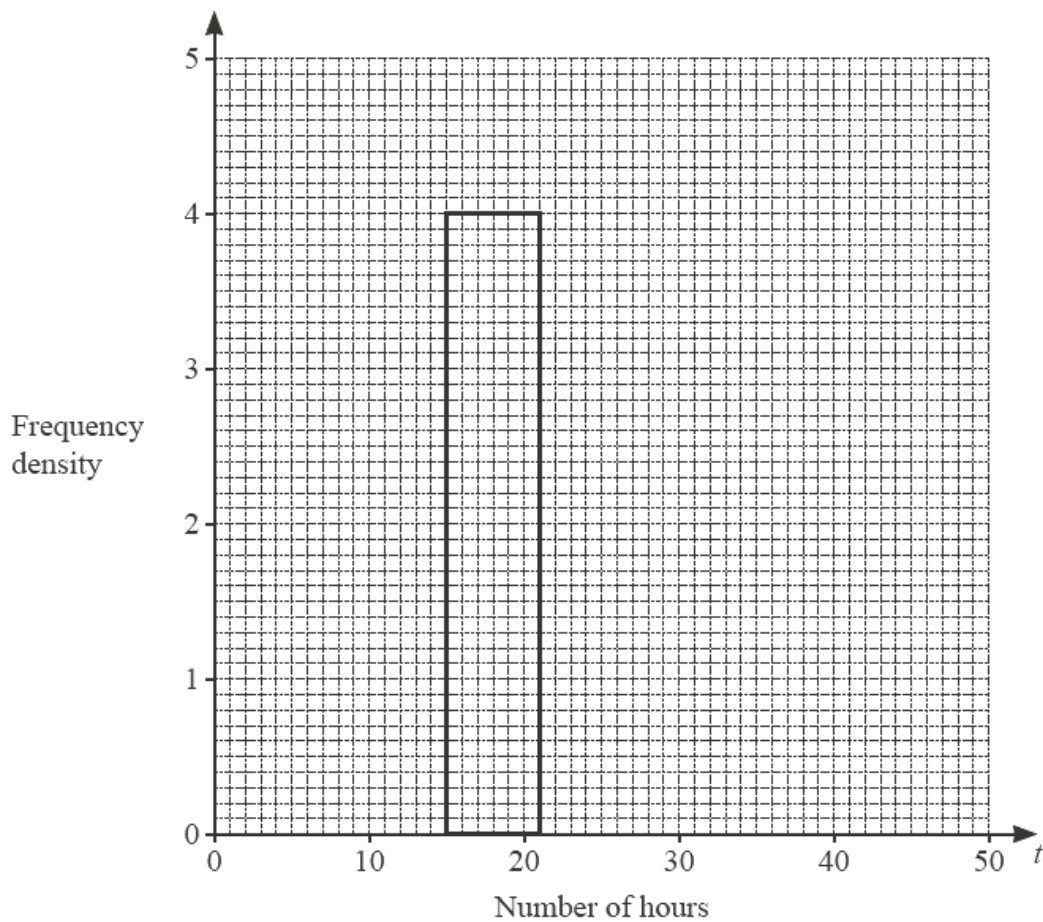.. % [2]

9. June/2023/Paper_ 4024/11/No.24

100 batteries are tested to see how long they last.
The table shows the results.

Number of hours (t)	$10 < t \leqslant 15$	$15 < t \leqslant 21$	$21 < t \leqslant 30$	$30 < t \leqslant 50$
Frequency	10	24	36	30

Complete the histogram to show this information.

Frequency density

Number of hours

[3]

10. June/2023/Paper_ 4024/12/No.4(b)

(b) Shazia records the temperature, in °C, at 6 am every day for one week.

<div align="center">

5   2   −1   −7   −2   5   −5

</div>

(i) Find the median.

....°C [1]

(ii) Find the range.

.... °C [1]

11. June/2023/Paper_ 4024/12/No.7

Ben walks for exercise.
The scatter diagram shows the distance for 10 walks and the time each walk takes.
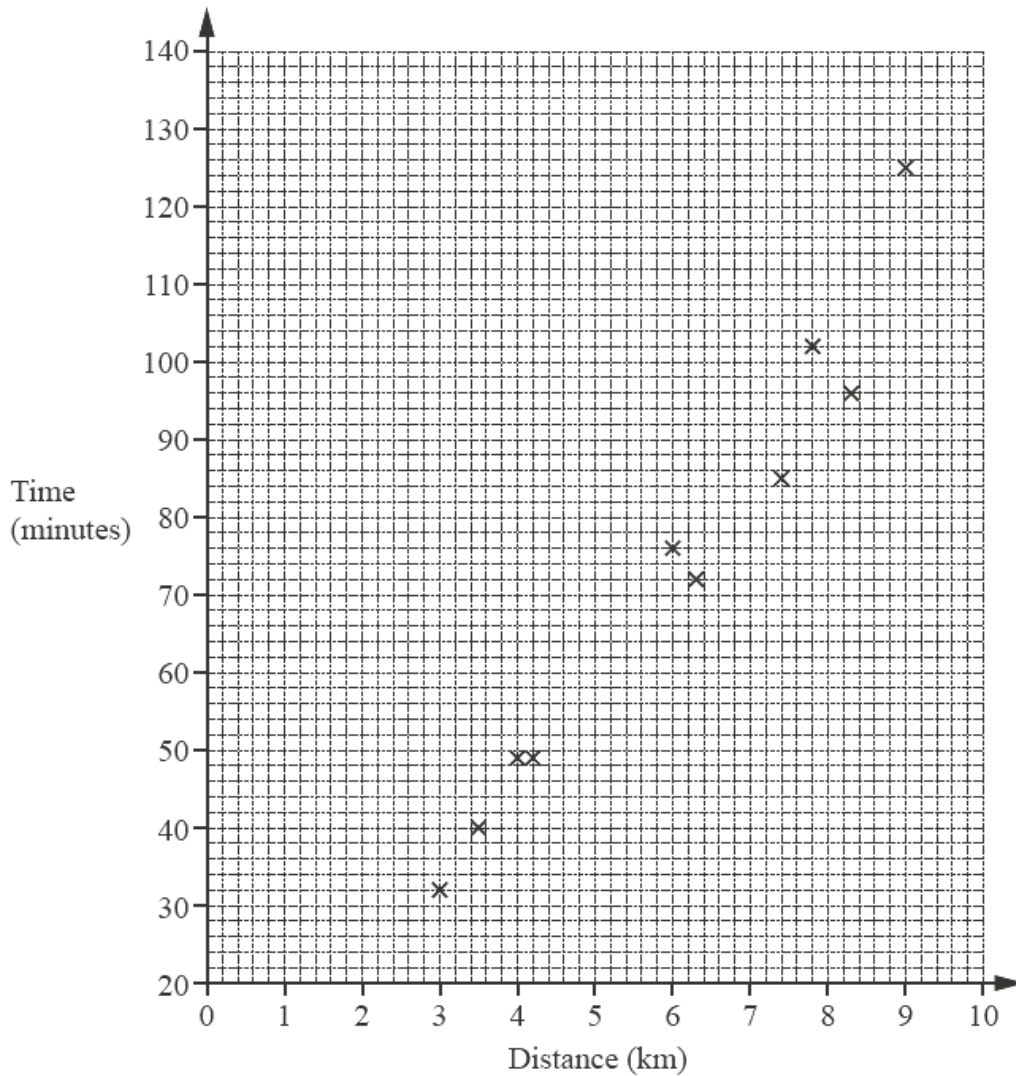
(a) Write down the type of correlation that the scatter diagram shows.

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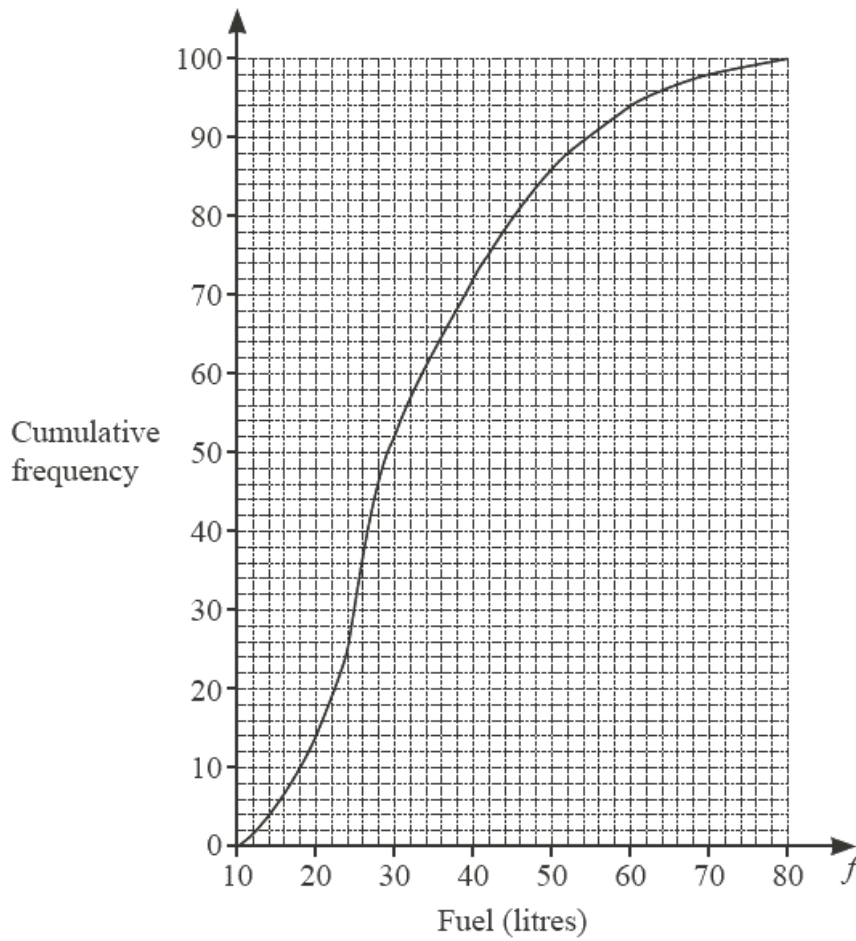
(b) Draw a line of best fit. [1]

(c) Use your line of best fit to estimate the time Ben takes for a 5 km walk.

.... minutes [1]

12. June/2023/Paper_ 4024/21/No.4

The cumulative frequency diagram shows the amount of fuel, f litres, bought by 100 customers at a service station one day.

Cumulative frequency / Fuel (litres)

(a) Use the diagram to estimate

    (i) the median

                                        .... litres [1]

    (ii) the interquartile range.

                                          .... litres [2]

(b) That day the price of a litre of fuel at the service station was $1.75 .

Use the diagram to find the fraction of customers who spent more than $91.00 on fuel.

.... [3]

(c) Complete the frequency table for the amount of fuel bought by these 100 customers.

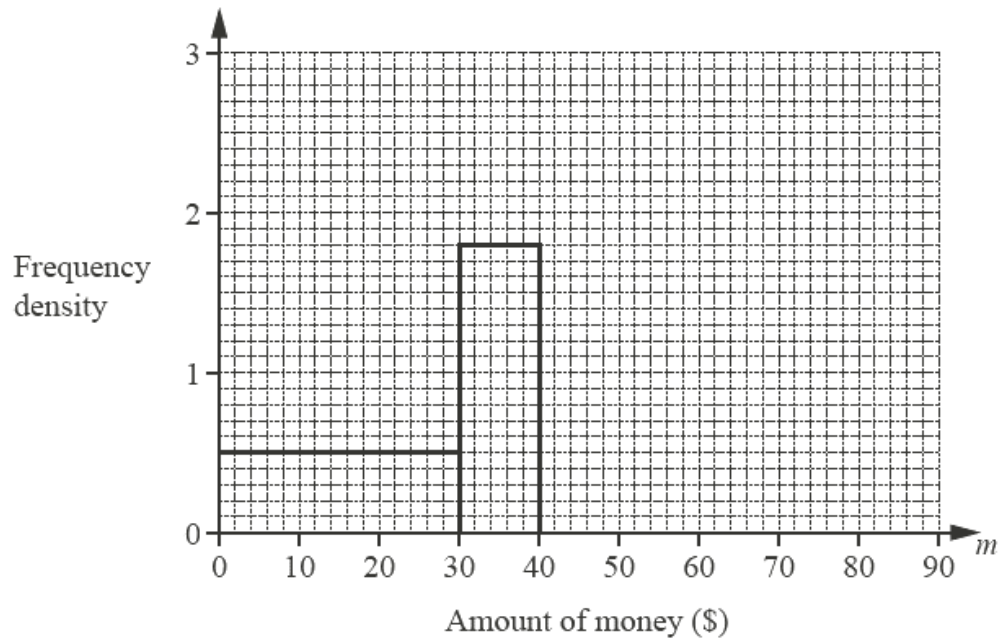| Amount of fuel (f litres)	$10 < f \leqslant 20$	$20 < f \leqslant 30$	$30 < f \leqslant 40$	$40 < f \leqslant 50$	$50 < f \leqslant 60$	$60 < f \leqslant 70$	$70 < f \leqslant 80$
Frequency	14	38	20				

[2]

13. June/2023/Paper_ 4024/22/No.7

(a) On Monday, the amount of money spent on a website by each customer was recorded.
The table shows the results.

Amount of money (m)	$0 < m \leqslant 30$	$30 < m \leqslant 40$	$40 < m \leqslant 50$	$50 < m \leqslant 60$	$60 < m \leqslant 90$
Frequency	p	18	24	19	24

The histogram shows some of the results.

Frequency density

Amount of money ($)

(i) Find the value of p.

$p =$ .... [1]

(ii) Complete the histogram. [3]

(iii) One of these customers is selected at random to receive a discount voucher.

Calculate the probability that this customer spent more than $50 on Monday.

.... [1]

(b) The table shows the amount of money spent on a website by each customer on Tuesday.

Amount of money (m)	$0 < m \leqslant 30$	$30 < m \leqslant 40$	$40 < m \leqslant 50$	$50 < m \leqslant 60$	$60 < m \leqslant 90$
Frequency	22	16	24	19	14

(i) Calculate an estimate of the mean.

$ .... [3]

(ii) An error was made and one of the sales on Tuesday was not included in the table.
That customer spent $41.
Tristan says:

> If that value had been included in the table, then the **estimated** mean would have been higher.

Without calculation, explain why he is correct.

....

.... [1]