IGCSE · Cambridge (CIE) · Maths

58 mins 16 questions

Exam Questions

Scatter Graphs & Correlation

Scatter Graphs & Correlation / Lines of Best Fit

Easy (6 questions)	/12
Medium (5 questions)	/20
Hard (5 questions)	/26
Total Marks	**/58**

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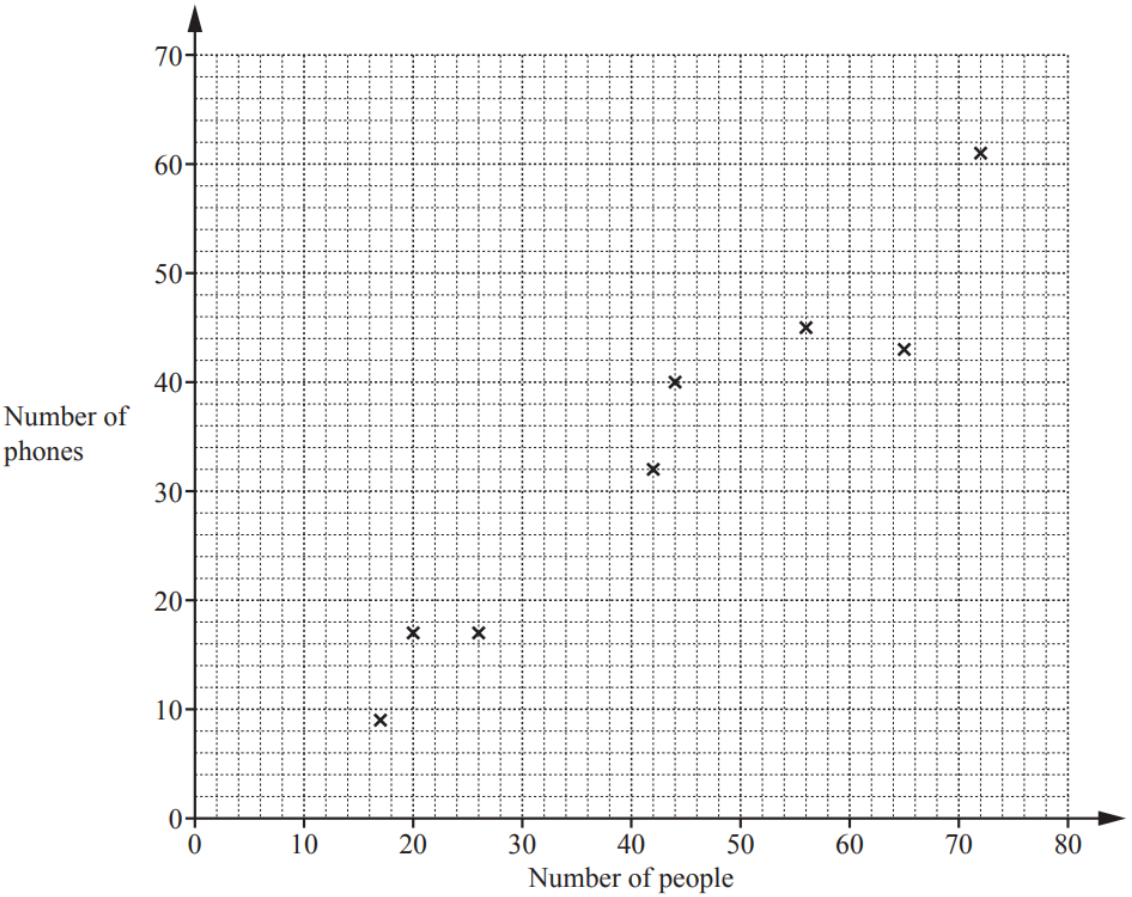
Easy Questions

1 (a) The scatter diagram shows the number of people and the number of phones in each of 8 buildings.



One of the buildings contains 42 people.

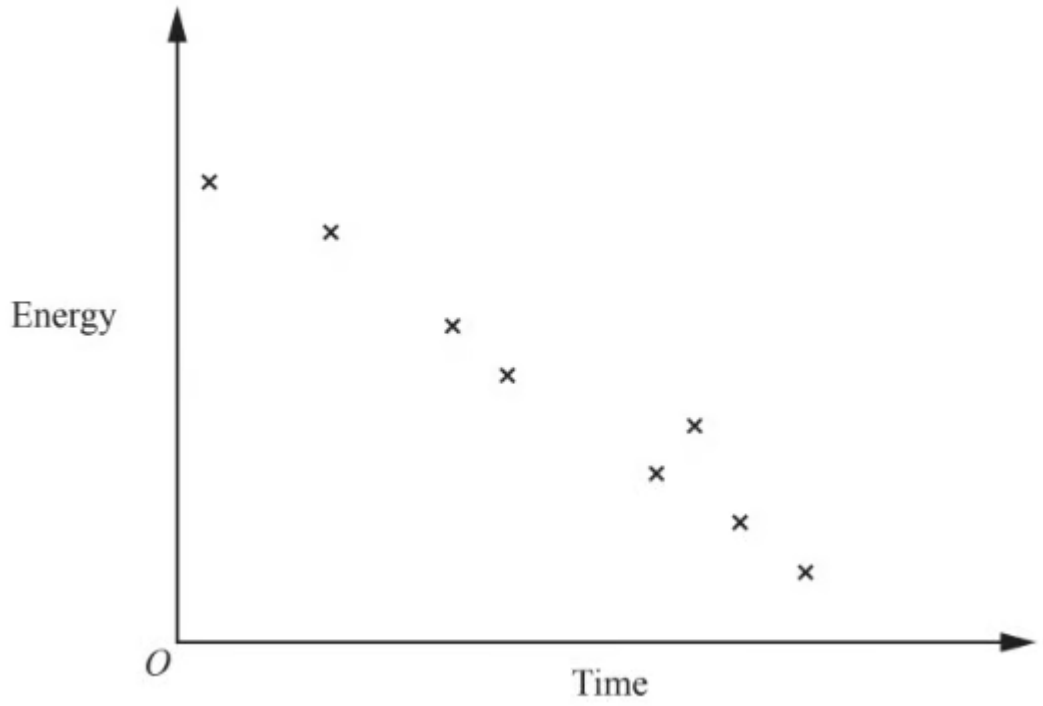
Write down the number of phones in this building.

(1 mark)

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

(1 mark)

2



What type of correlation does the scatter diagram show?

(1 mark)

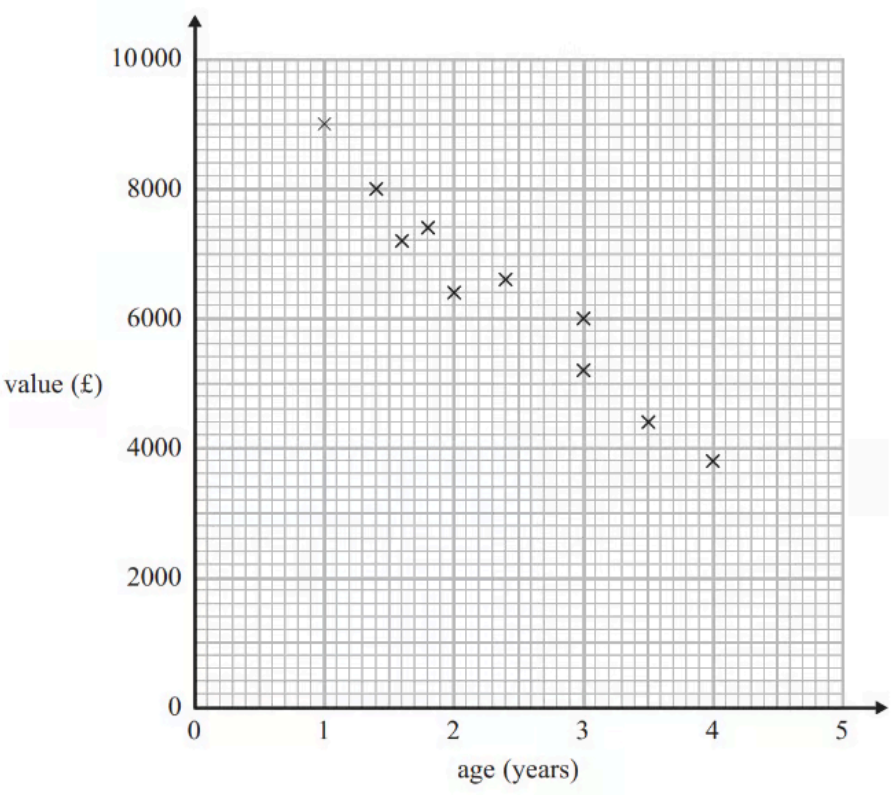
3 "We eat more ice cream as the temperature rises."

What type of correlation is this?

(1 mark)

4 (a) The scatter graph shows some information about 10 cars, of the same type and make.

The graph shows the age (years) and the value (£) of each car.



The table shows the age and the value of two other cars of the same type and make.

age(years)	1	3.5
value(£)	8200	5000

On the scatter graph, plot the information from the table.

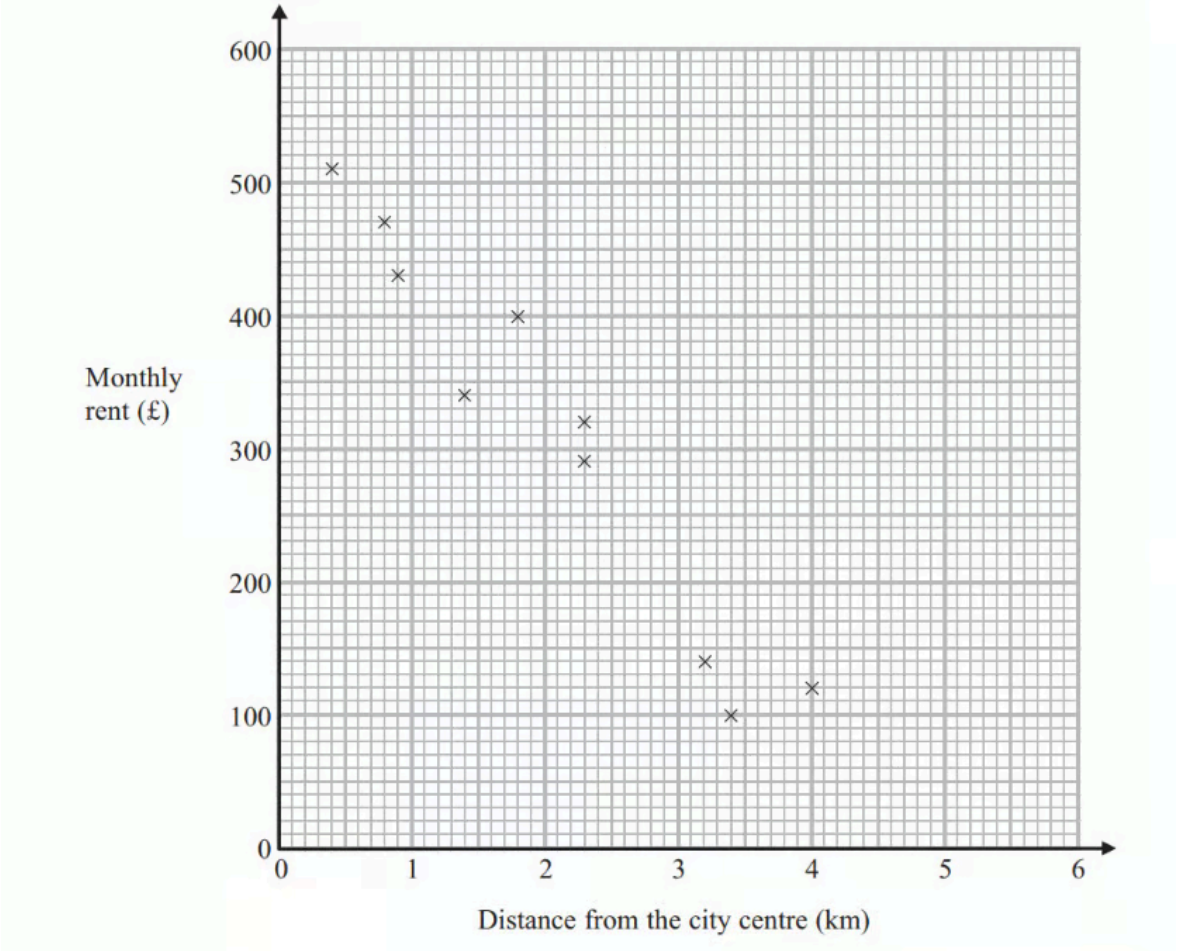
(1 mark)

(b) Describe the relationship between the age and the value of the cars.

(1 mark)

5 (a) The scatter graph shows information about 10 apartments in a city.

The graph shows the distance from the city centre and the monthly rent of each apartment.



The table shows the distance from the city centre and the monthly rent for two other apartments.

Distance from the city centre(km)	2	3.1
Monthly rent(£)	250	190

On the scatter graph, plot the information from the table.

(1 mark)

(b) Describe the relationship between the distance from the city centre and the monthly rent.

(1 mark)

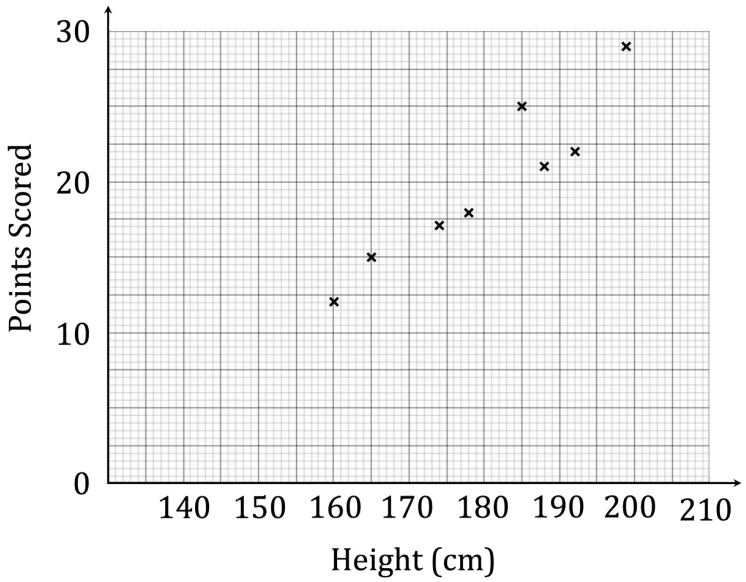
6 (a) 13 high school basketball players recorded their scores in a game.

The table shows each player's height (in cm) and the number of points they scored in the game.

Height	160	165	192	178	185	174	188	199	170	182	176	190	167
Score	12	15	22	18	25	17	21	29	14	24	19	27	13

Complete the scatter diagram using the points in the table.

The first eight points have already been plotted.



(2 marks)

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

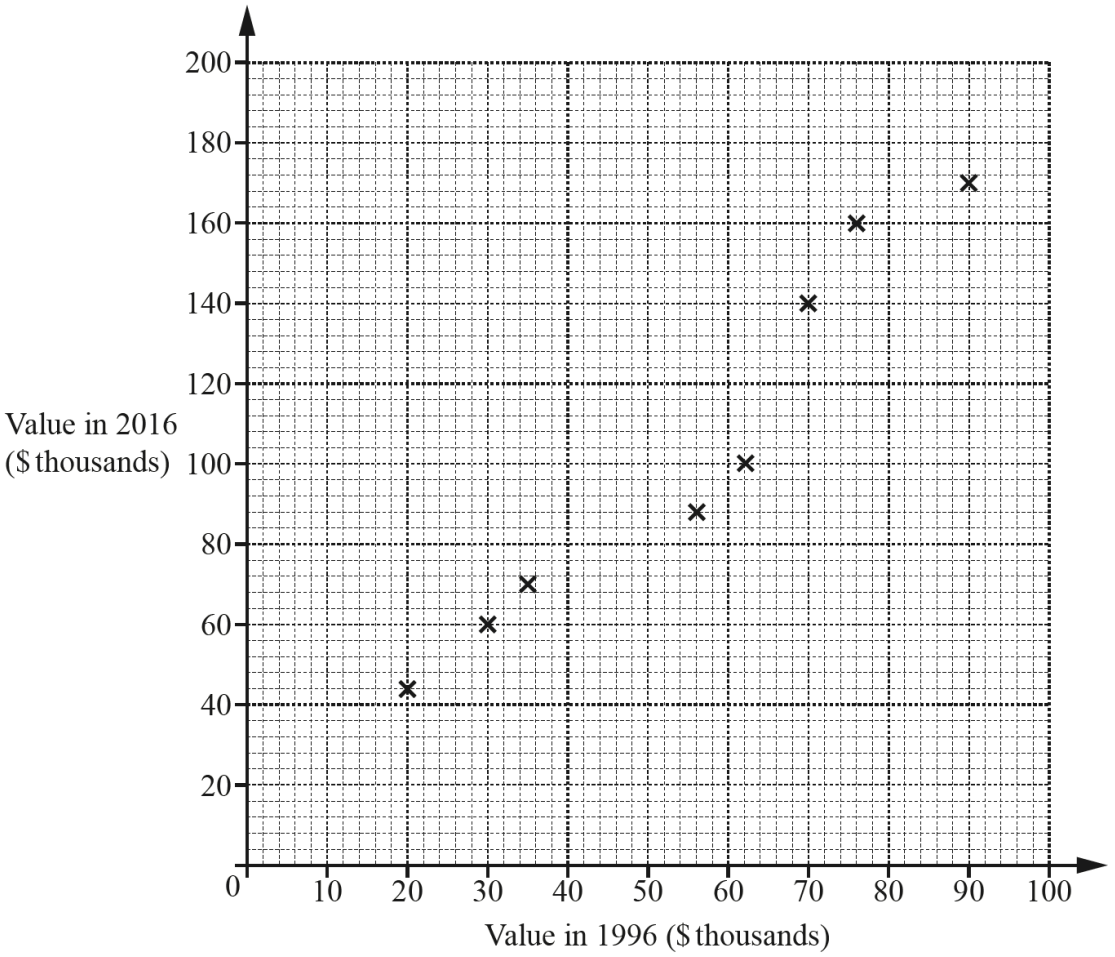
(1 mark)

(c) Draw the line of best fit on the scatter diagram.

(1 mark)

Medium Questions

1 (a) The scatter diagram shows the value, in thousands of dollars, of eight houses in 1996 and the value of the same houses in 2016.



One of these eight houses had a value of $70 000 in 1996.

Write down the value of this house in 2016.

$ .....

(1 mark)

(b) The values of two more houses are shown in the table.

Value in 1996 ($ thousands)	40	80
Value in 2016 ($ thousands)	80	150

On the scatter diagram, plot these values.

(1 mark)

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

(1 mark)

(d) Another house had a value of $50 000 in 1996.

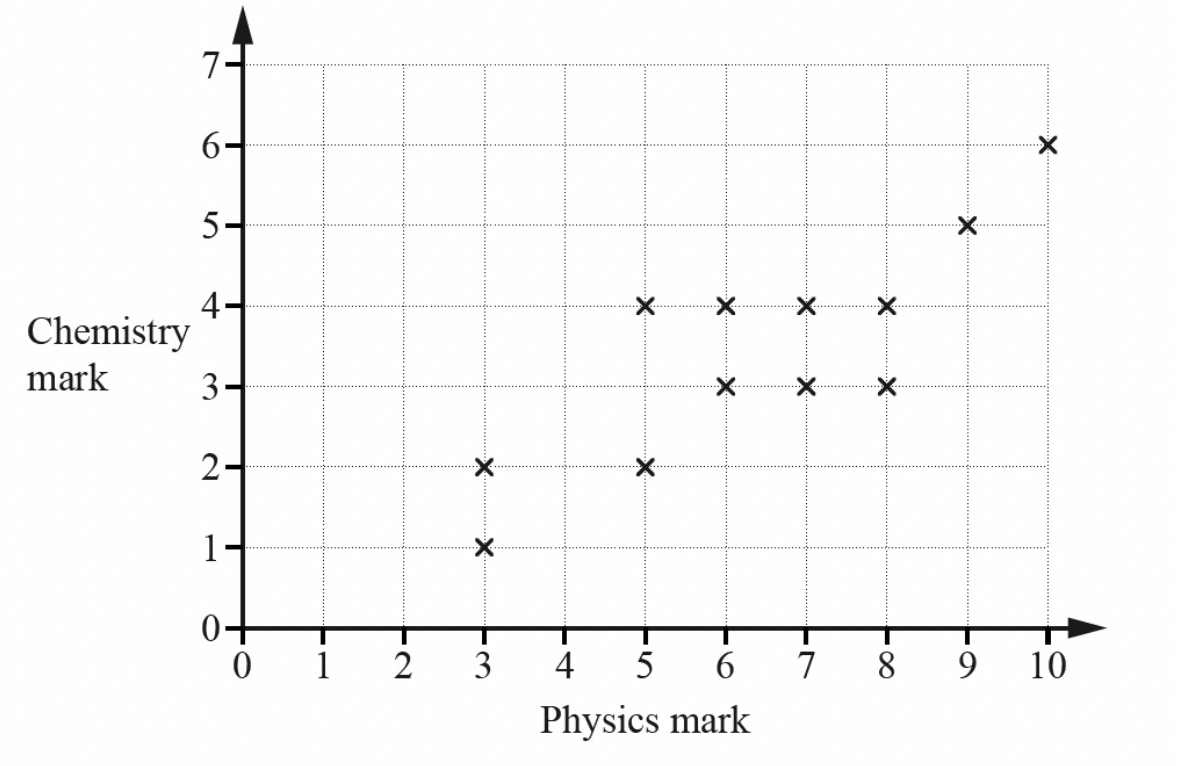
Find an estimate of the value of this house in 2016.

$ .....

(1 mark)

2 The scatter diagram shows the physics mark and the chemistry mark for each of 12

students.



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

[1]

ii)On the scatter diagram, draw a line of best fit.

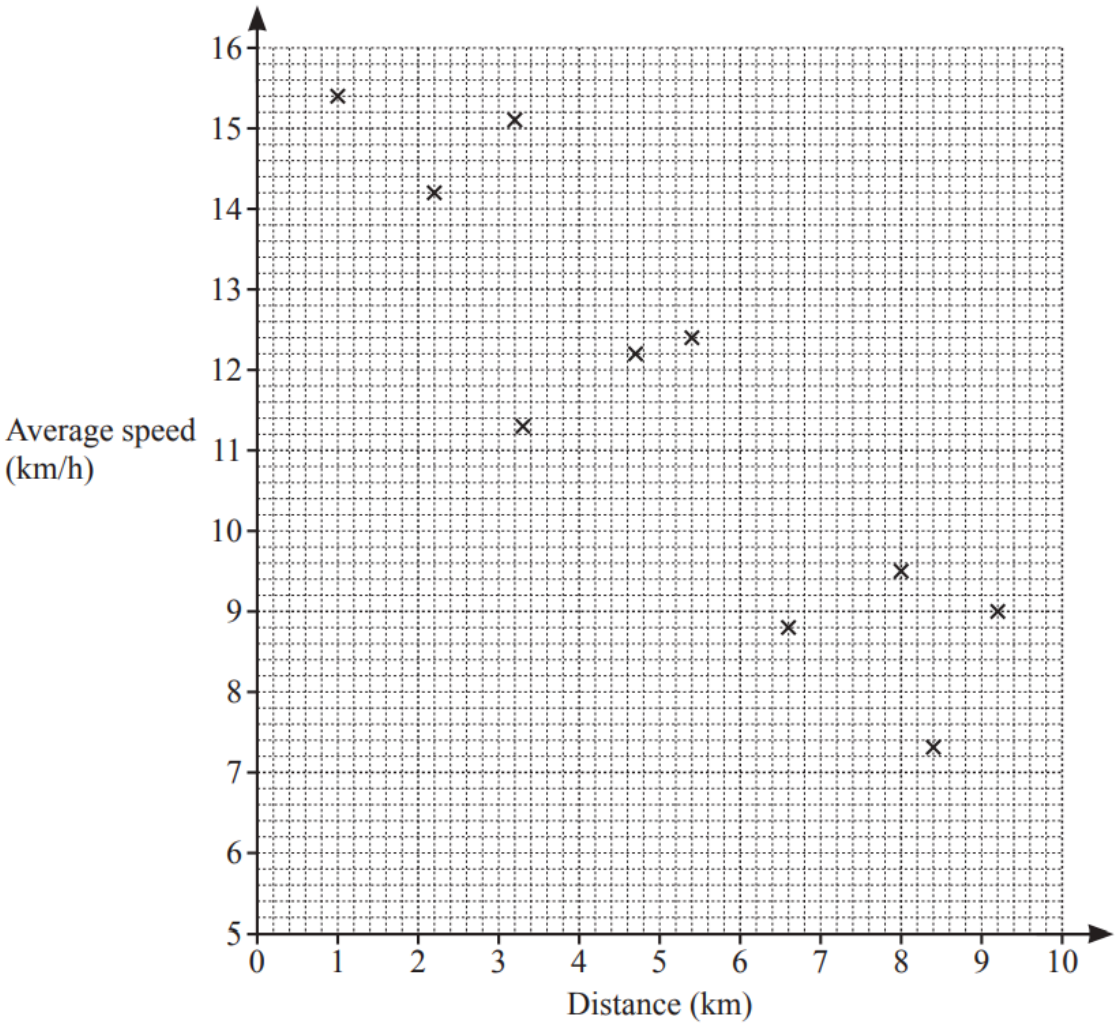
[1]

iii) Find an estimate of the chemistry mark for another student who has a physics mark of 4.

[1]
(3 marks)

3 (a) Aisha records the distance she runs and her average speed.

The results are shown in the scatter diagram.



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 marks)

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

(1 mark)

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

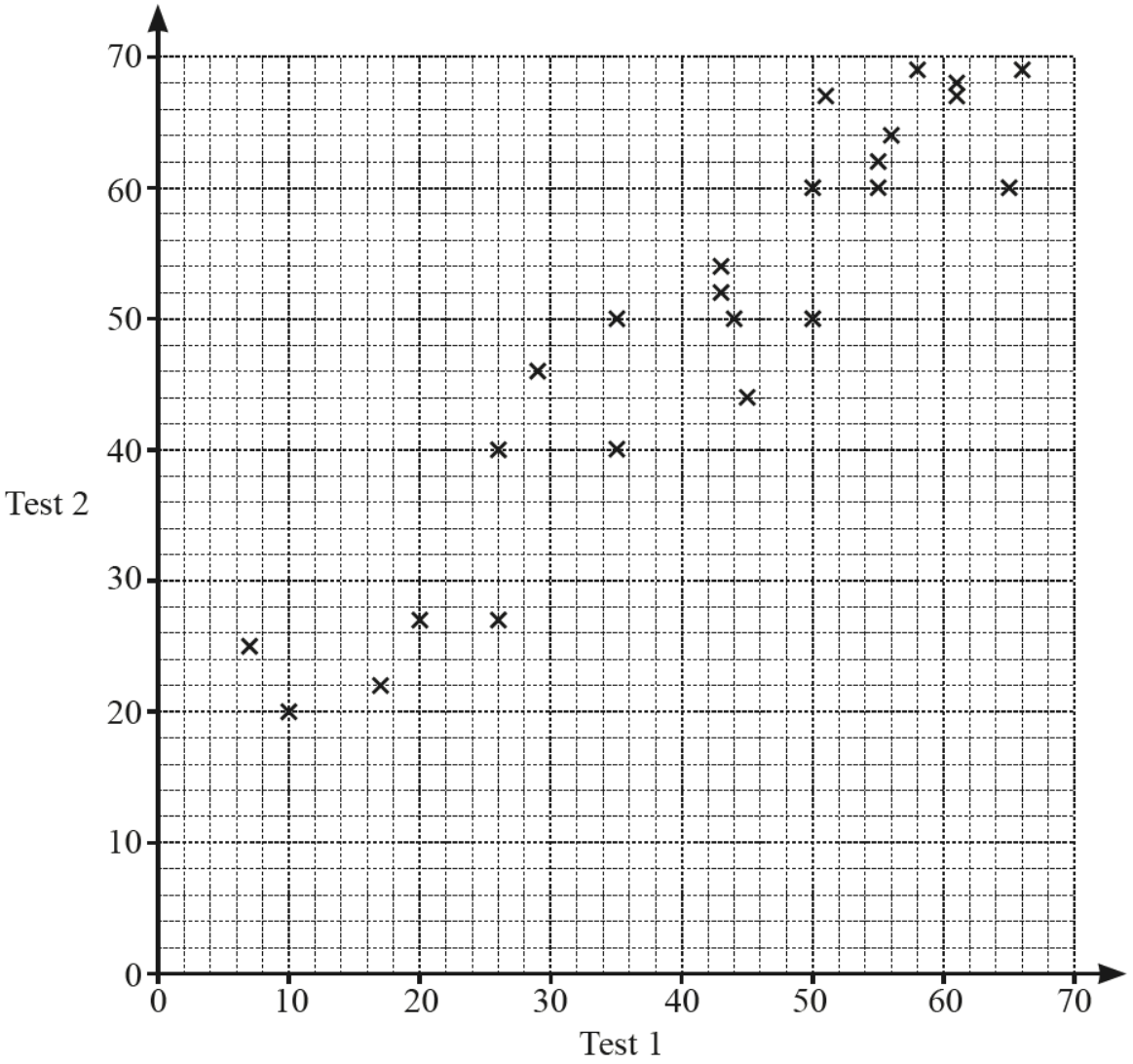
(1 mark)

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

..... km/h

(1 mark)

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



Write down the highest mark scored on test 1.

(1 mark)

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

(1 mark)

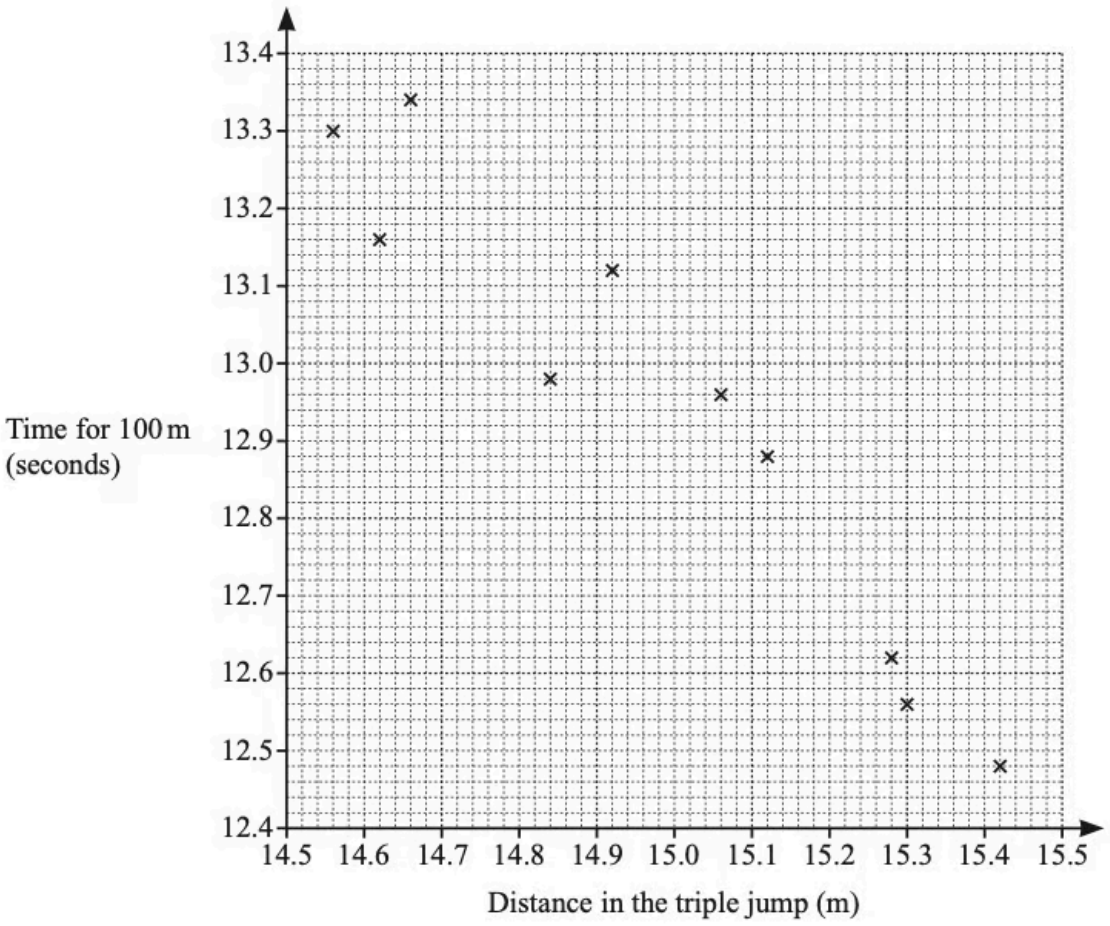
(c) Draw a line of best fit on the scatter diagram.

(1 mark)

(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 mark)

5 (a) Ten athletes compete in both the 100 metre race and the triple jump.
Their results are shown in the scatter diagram.



One of these athletes jumps 15.12 m in the triple jump.

Write down his time for the 100 metre race.

..... s

(1 mark)

(b) The values for two other athletes are shown in the table.

Distance in the triple jump (m)	14.74	15.2
Time for 100 m (seconds)	13.2	12.76

On the scatter diagram, plot these points.

(1 mark)

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

(1 mark)

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

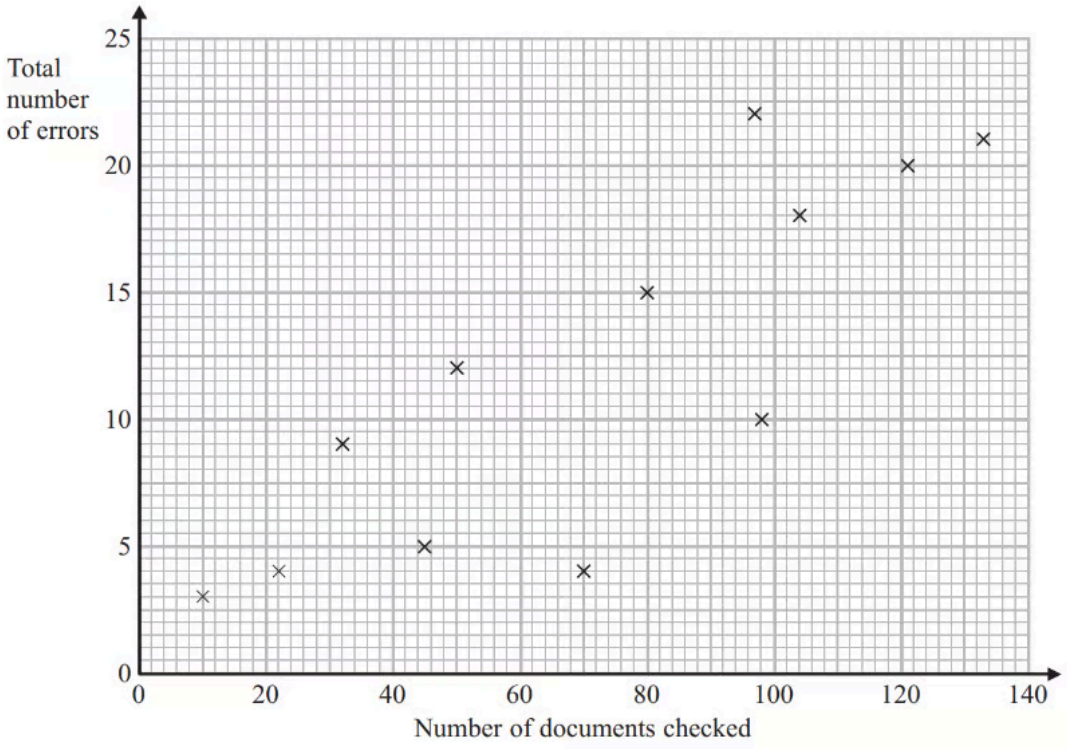
(1 mark)

Hard Questions

1 (a) A publisher checks documents for errors.

He records the number of documents that are checked each day.
He also records the total number of errors in the documents each day.

The scatter graph shows this information.



On another day 90 documents are checked.

There is a total of 17 errors.

Show this information on the scatter graph.

(1 mark)

(b) Describe the correlation between the number of documents checked and the total number of errors.

(1 mark)

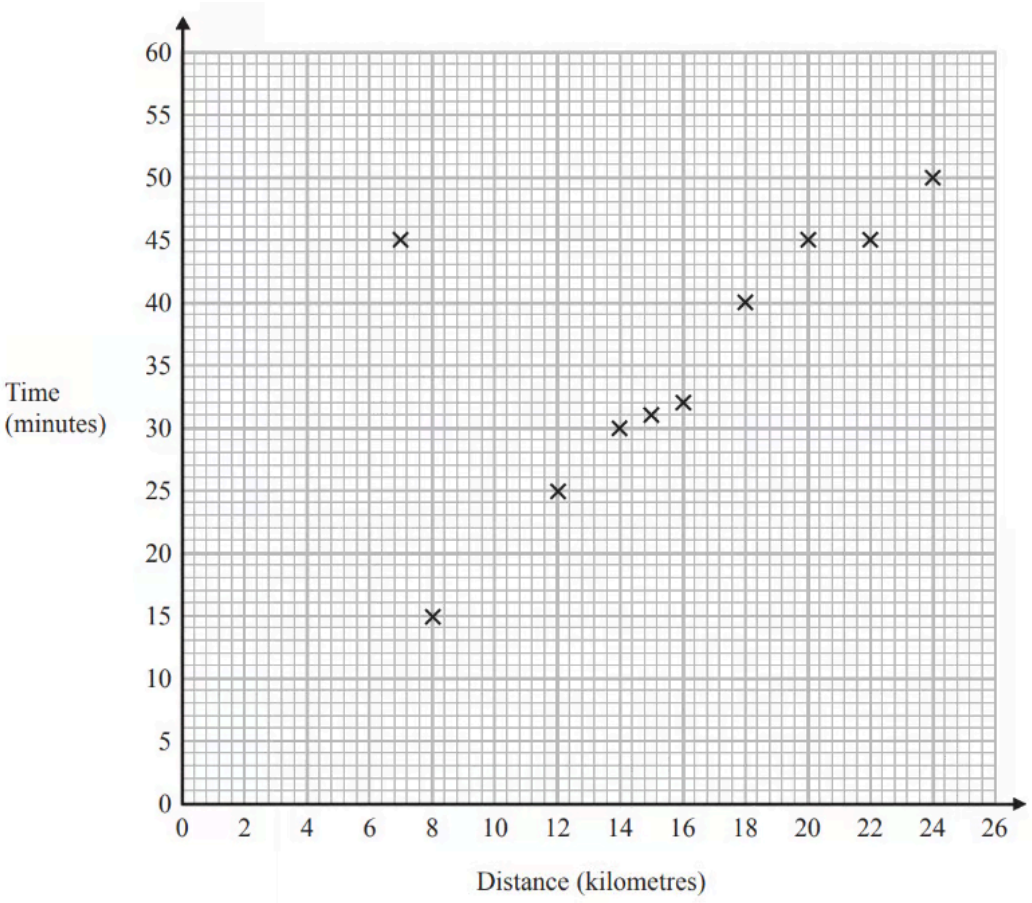
(c) One day 110 documents are checked.

Estimate the total number of errors in these documents.

(2 marks)

2 (a) A delivery driver records for each delivery the distance he drives and the time taken.

The scatter graph shows this information.



For another delivery he drives 22 kilometres and takes 50 minutes.

Show this information on the scatter graph.

(1 mark)

(b) What type of correlation does the scatter graph show?

(1 mark)

(c) The driver has to drive a distance of 10 km for his next delivery.

Estimate the time taken for this delivery.

(2 marks)

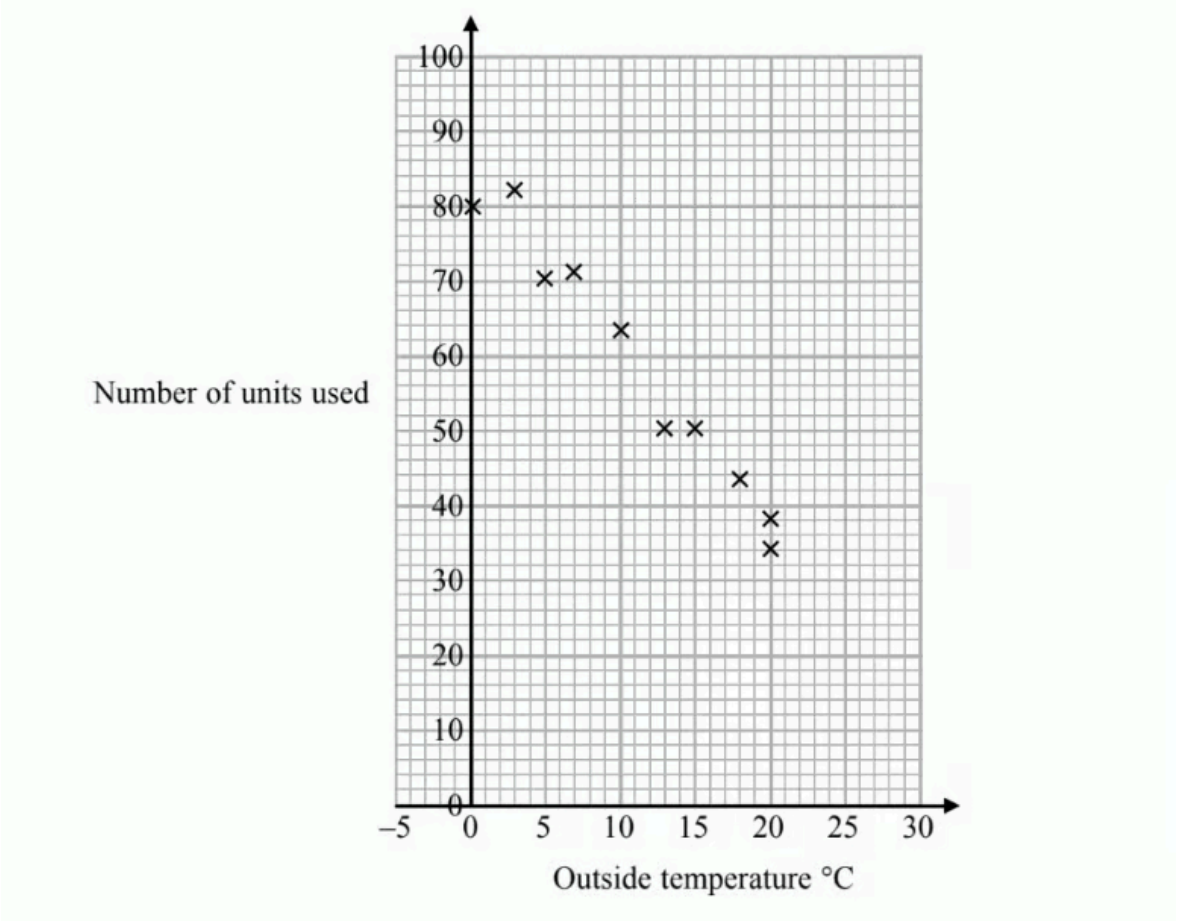
(d) During one of the deliveries, the driver was delayed by road works.

Using the graph write down the time taken for this delivery.

(1 mark)

3 (a) In a survey, the outside temperature and the number of units of electricity used for heating were recorded for ten homes.

The scatter diagram shows this information.



Molly says,

"On average the number of units of electricity used for heating decreases by 4 units for each °C increase in outside temperature."

Is Molly right?
Show how you get your answer.

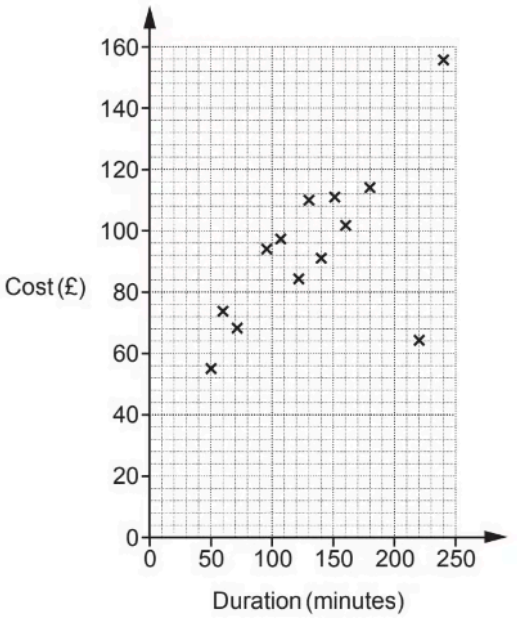
(3 marks)

(b) You should **not** use a line of best fit to predict the number of units of electricity used for heating when the outside temperature is 30 °C.

Give one reason why.

(1 mark)

4 (a) A travel agent records the duration and cost of the 15 flights he sold on one day.
The data for the first 13 flights are plotted on the scatter diagram.



The data for the final two flights is:

Duration	210 minutes	1 hour 40 minutes
Cost	£130	£80

Plot these flights on the scatter diagram.

(2 marks)

(b) The cost of one of the 15 flights had been discounted in a sale.

Circle the most likely flight on the scatter diagram.

(1 mark)

(c) i) Draw a line of best fit on the scatter diagram.

ii) Use your line of best fit to estimate the duration of a flight costing £90.

..... minutes

(1 mark)

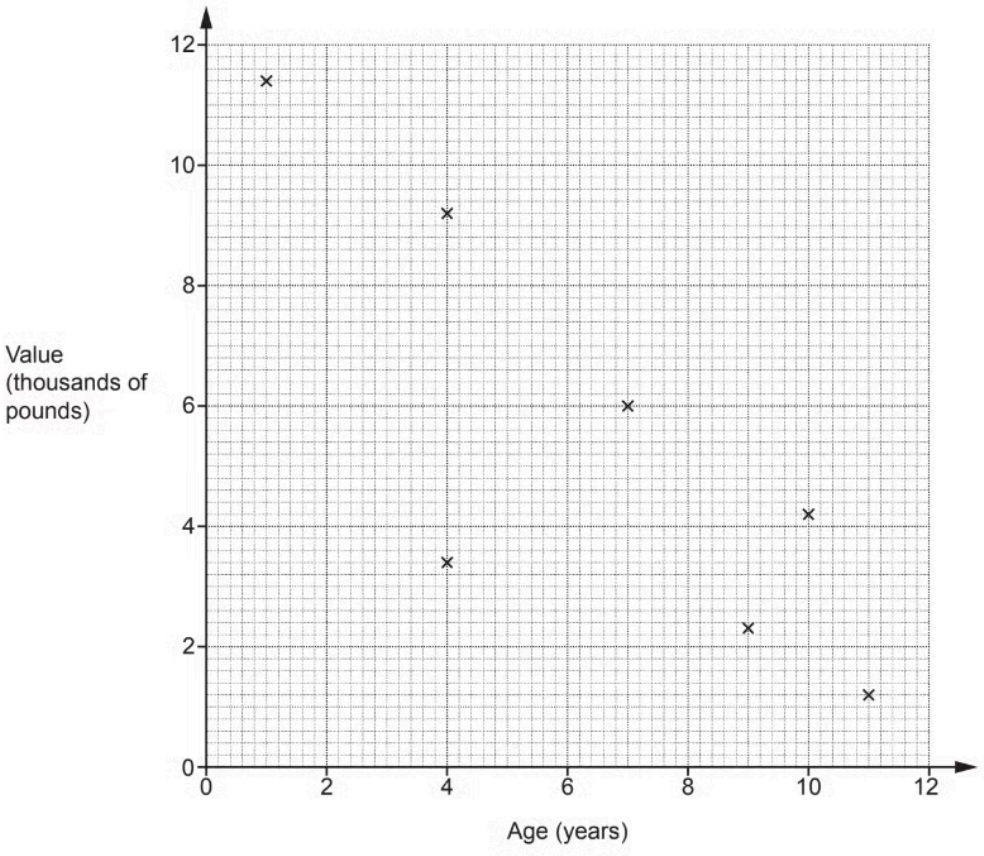
(d) Explain why the travel agent should not use his records to estimate the cost of a 7 hour flight.

(1 mark)

5 (a) The table shows the ages and values of 11 cars of the same model.

Age (years)	4	7	11	1	9	10	4	3	7	8	12
Value (thousands of pounds)	9.2	6.0	1.2	11.4	2.3	4.2	3.4	8.0	5.6	5.0	0.4

The points for the first 7 cars are plotted on the scatter diagram.



Plot the points for the remaining 4 cars.

(2 marks)

(b) Describe the type and strength of the correlation shown in the completed scatter diagram.

(2 marks)

(c) One car lost its value more quickly than the other cars.

On the scatter diagram, draw a circle around the point representing this car.

(1 mark)

(d) By drawing a line of best fit, estimate the value of a car that is 6 years old.

£ .....

(2 marks)

(e) Explain the limitations of using the equation of the line of best fit to estimate the value of a car that is 16 years old.

(1 mark)