

Name:

Exam Style Questions

## Scatter Graphs



Corbettmaths

Equipment needed: Pencil, Ruler, Pen, Calculator

### Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

### Video Tutorial

[www.corbettmaths.com/contents](http://www.corbettmaths.com/contents)

Videos 165 to 168



### Answers and Video Solutions



1. Eight students sat a music test.



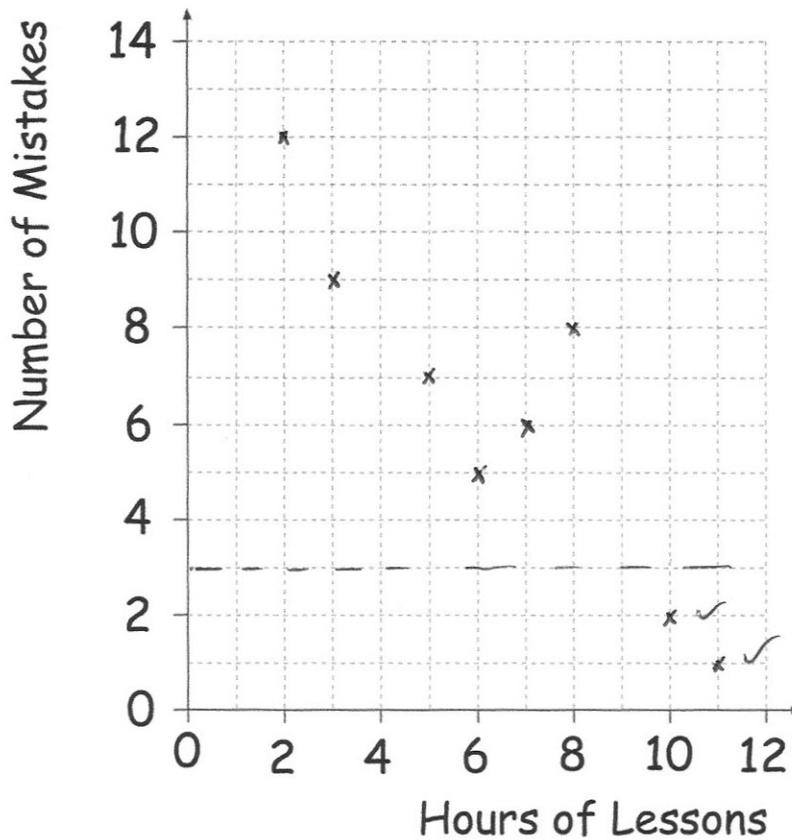
The table shows information about how many hours of lessons they had and the number of mistakes made in the test.

Hours of lessons	8	2	5	3	10	7	11	6
Number of mistakes	8	12	7	9	2	6	1	5

✓
✓
✓
✓
✓
✓
✓
✓
✓

(a) Show this information on the scatter graph below.

(2)



A student is awarded a prize if they make less than 3 mistakes.

(b) How many students are awarded a prize?

2

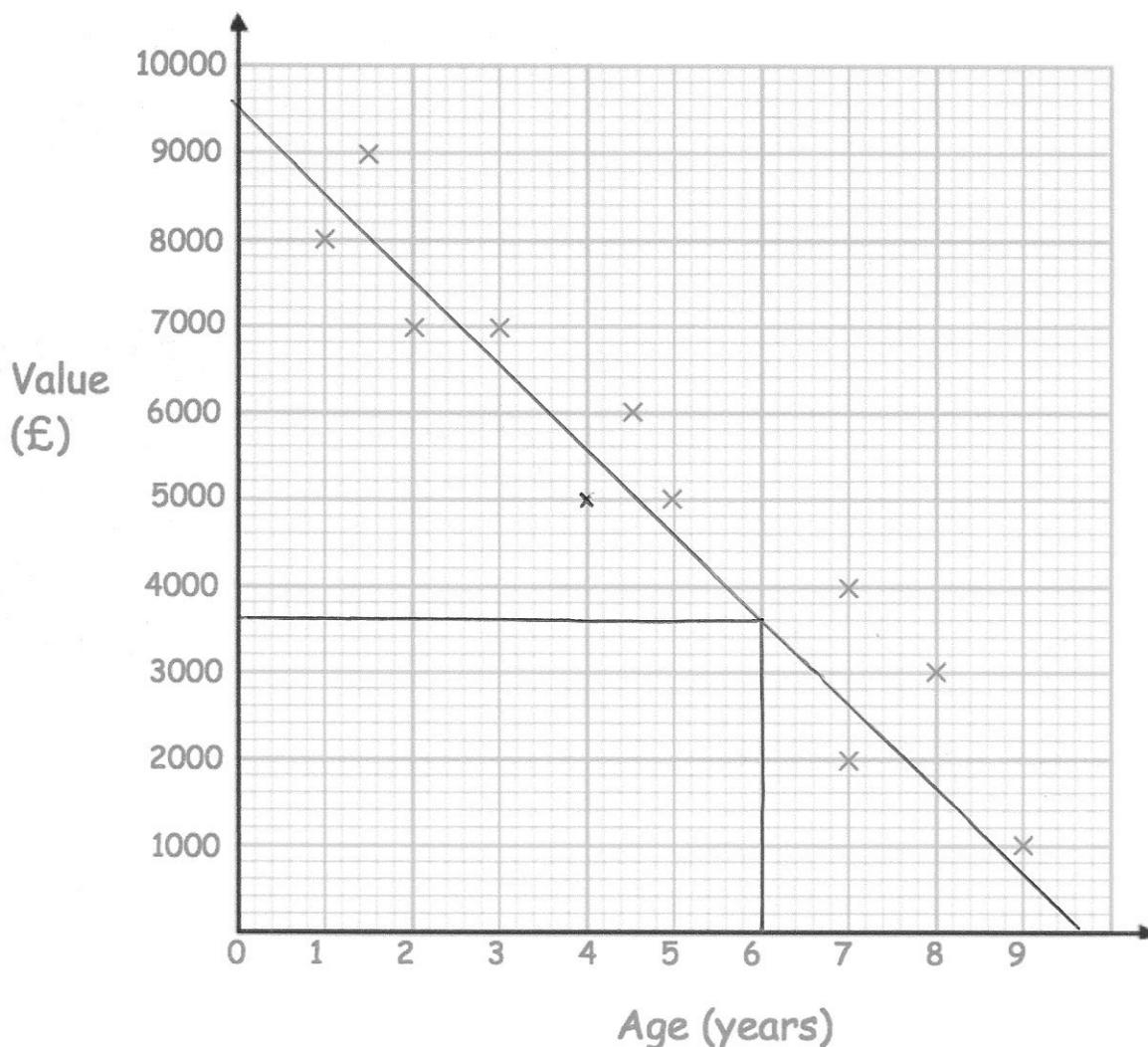
(1)

(c) Complete the sentence below.

Generally the more hours of lessons, the *less* mistakes are made.

(1)

2. The value of cars in a used car garage are recorded below.  
The scatter graph shows this information.



Another car arrives at the garage.  
It is 4 years old and worth £5000.

- (a) Show this information on the scatter graph. (1)

- (b) Describe the correlation between the value of the car and the age of the car.

*negative correlation*..... (1)

The next car that arrives is 6 years old.

- (c) Estimate the value of the car.

*\* This may vary based on your line of best fit.*

£ *3600*..... (2)

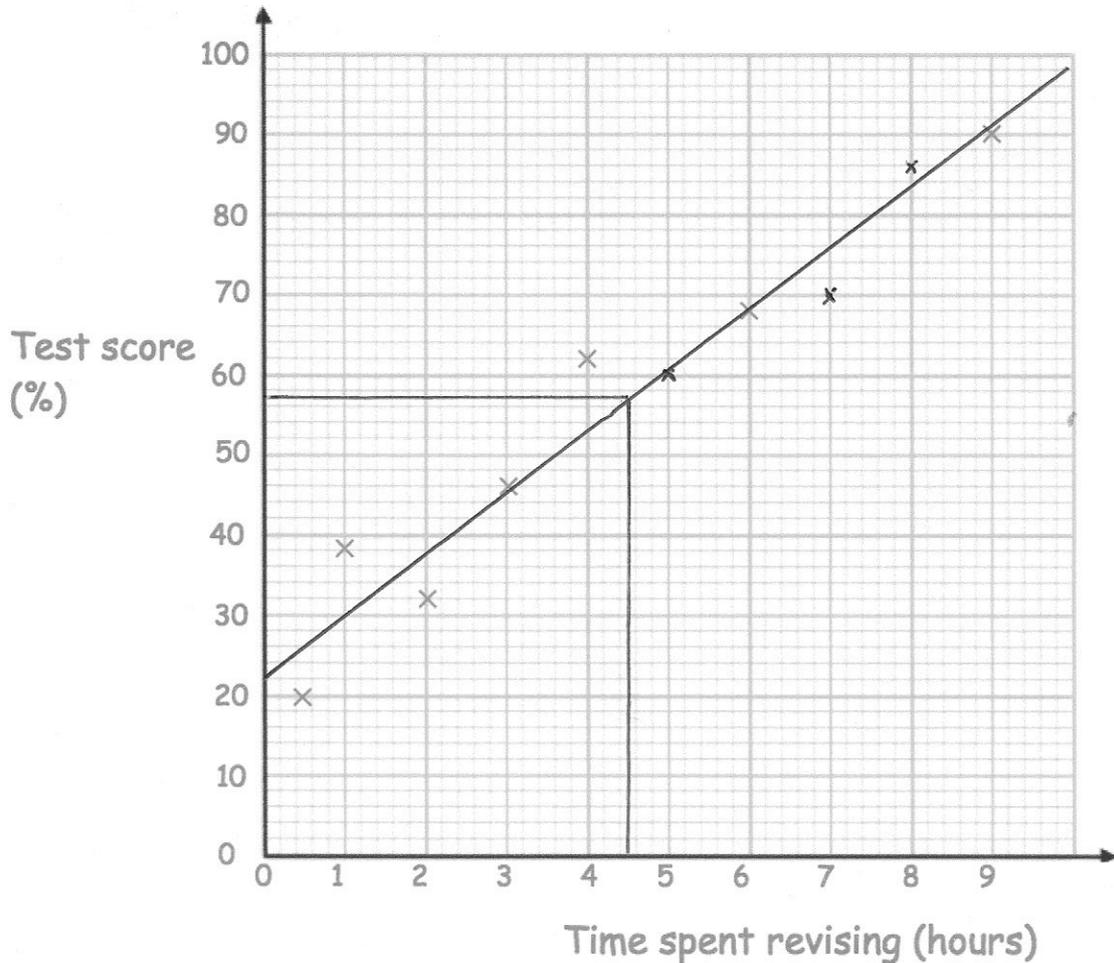
3. The table shows the time spent revising and the test scores of ten students.



Time spent revising (hours)	9	0.5	1	4	6	2	3	7	5	8
Test result (%)	90	20	38	62	68	32	46	70	60	86

✓ ✓

The first seven points have been plotted on this scatter diagram.



(a) Complete the scatter diagram.

(1)

(b) Describe the relationship shown in the scatter diagram.

As the time spent revising increases, so does the test score. (Positive correlation)

(1)

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

(1)

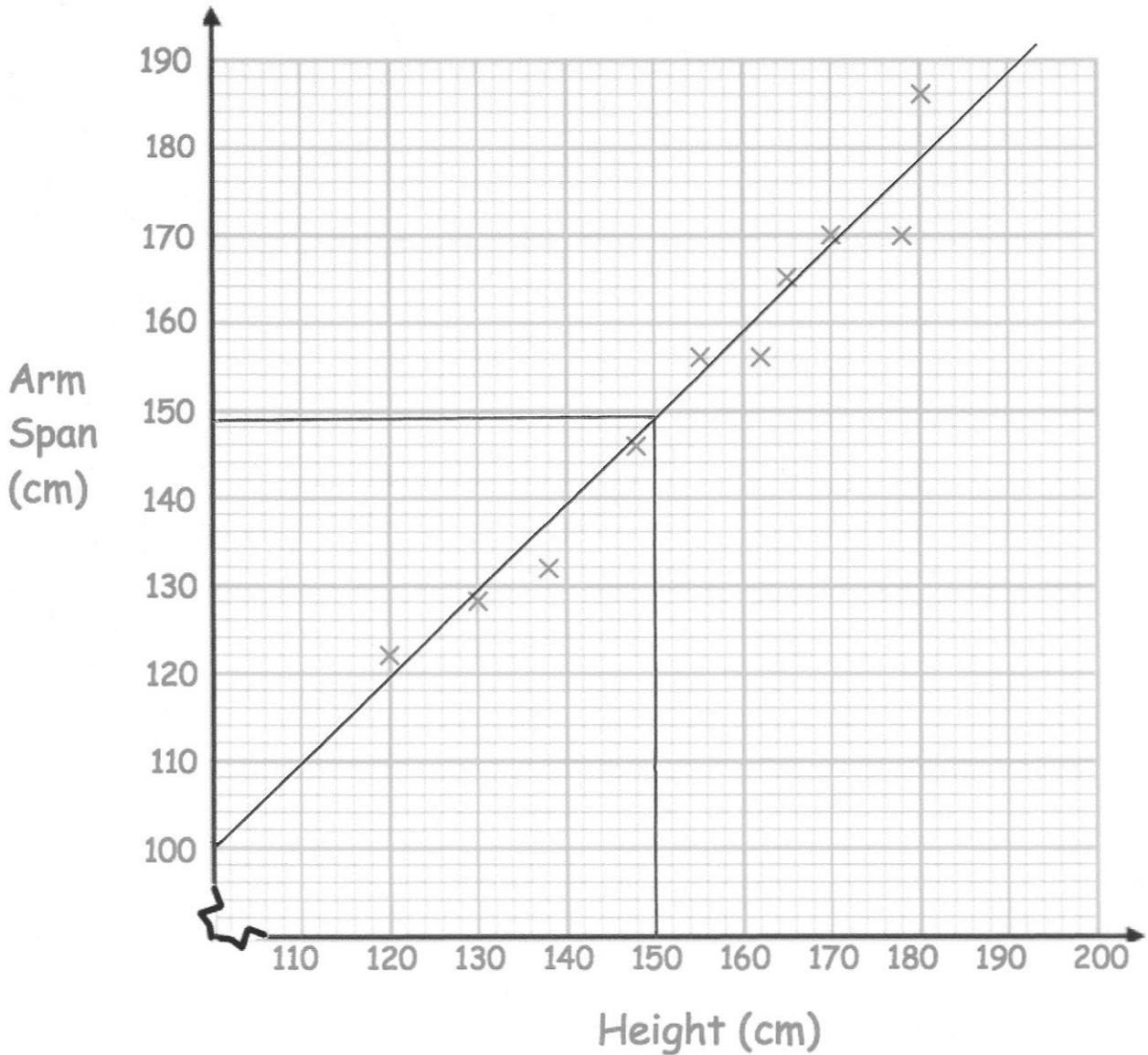
(d) Another student has spent 4.5 hours revising.

Use your line of best fit to estimate their test result.

this may vary slightly based on your line of best fit. 57%

(1)

4. The scatter graph shows information about the heights and arm spans of ten students in a school.



- (a) What type of correlation does this scatter graph show?

*positive*  
.....  
(1)

Another student has a height of 150cm.

- (b) Estimate the arm span of this student.

*149*  
.....cm  
(2)

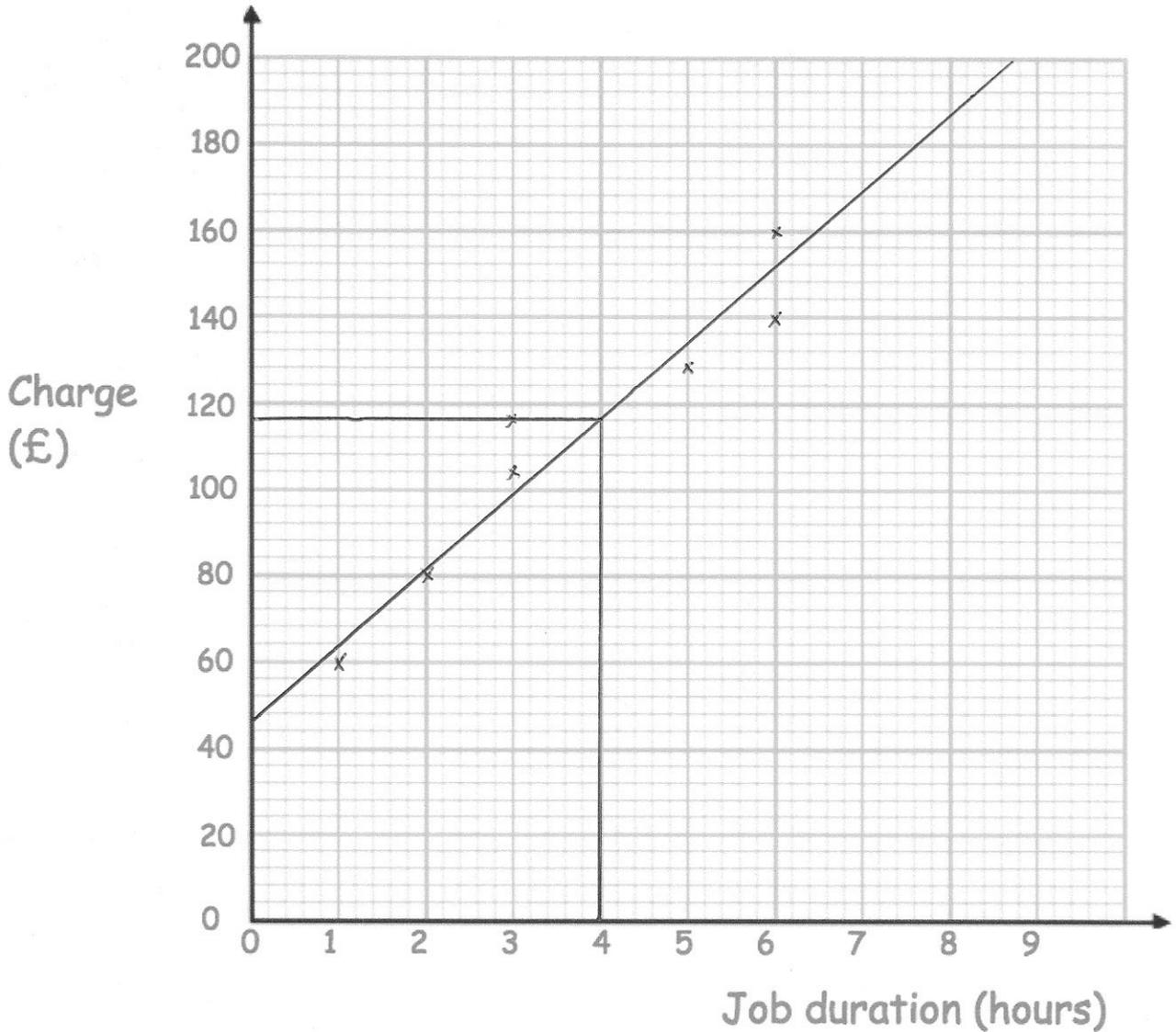
5. The table shows the charge (£) by plumbers for jobs of different duration (hours).



Job duration (hours)	1	2	3	3	5	6	6
Charge (£)	60	80	104	116	128	140	160

(a) Plot the data on the scatter graph below.

(2)



(b) Describe the correlation.

There is a positive correlation, which means as the job duration increases, so does the charge.

(1)

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

(1)

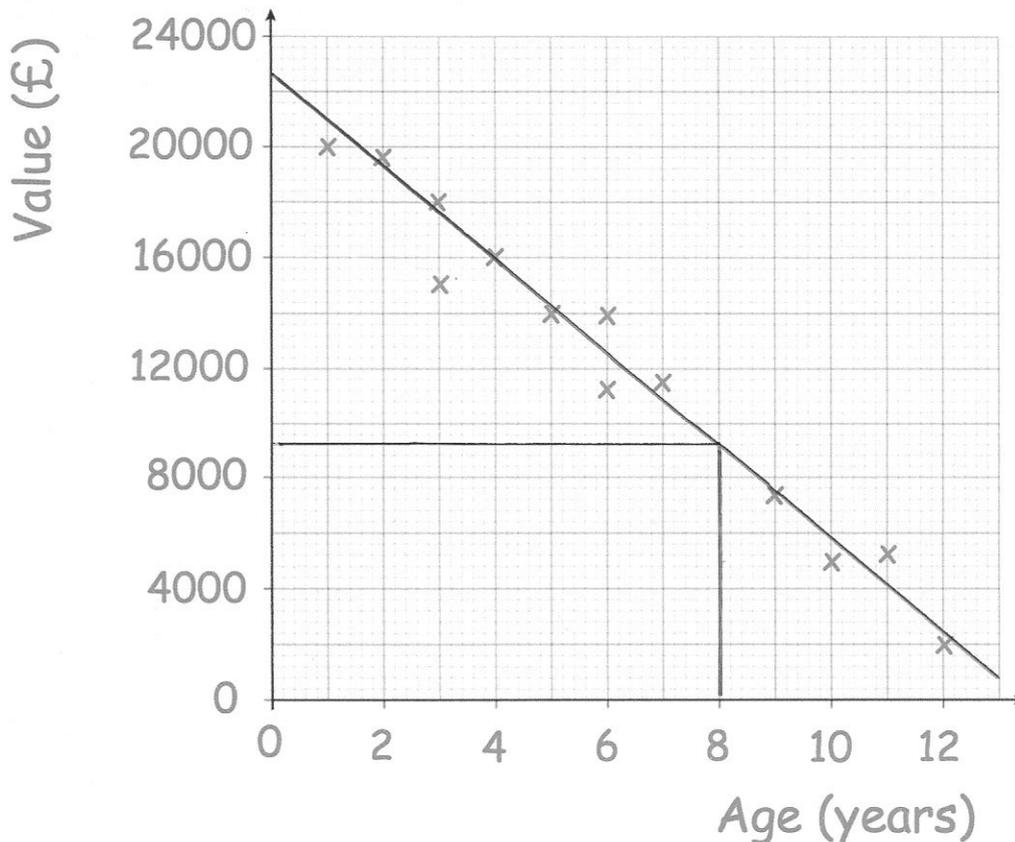
(d) Use your line of best fit to estimate the charge for a 4 hour job.

£..... 116 .....  
(1)

(e) Explain why it may **not** be appropriate to use your line of best fit to estimate the charge for a job lasting 12 hours.

It is beyond the range of the data.  
It is extrapolation, therefore unpredictable.  
(1)

6. The scatter graph shows the age and value of some cars.

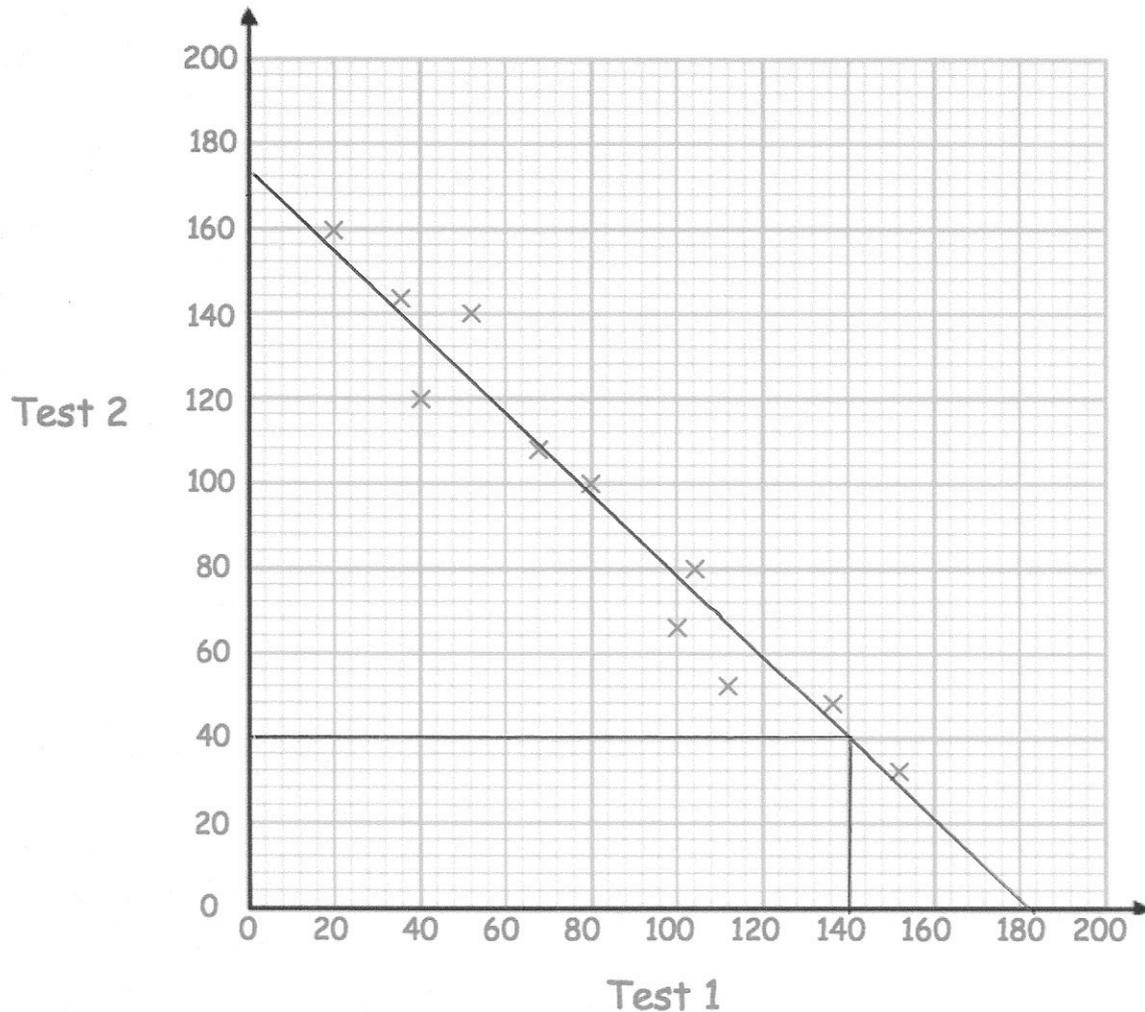


Using the scatter graph, find an estimate for the value of an 8 year old car.

£..... 9200 .....  
(2)

7.  Some rugby players take two tests, one measuring speed and the other measuring strength. Each test is marked out of 200.

The scatter graph compares the results.



- (a) What type of coordinate does this scatter graph show?

*Negative*  
.....  
(1)

- (b) Draw a line of best fit on the scatter graph.

(1)

Brian scores 40 in Test 2.

- (c) Estimate his score in Test 1.

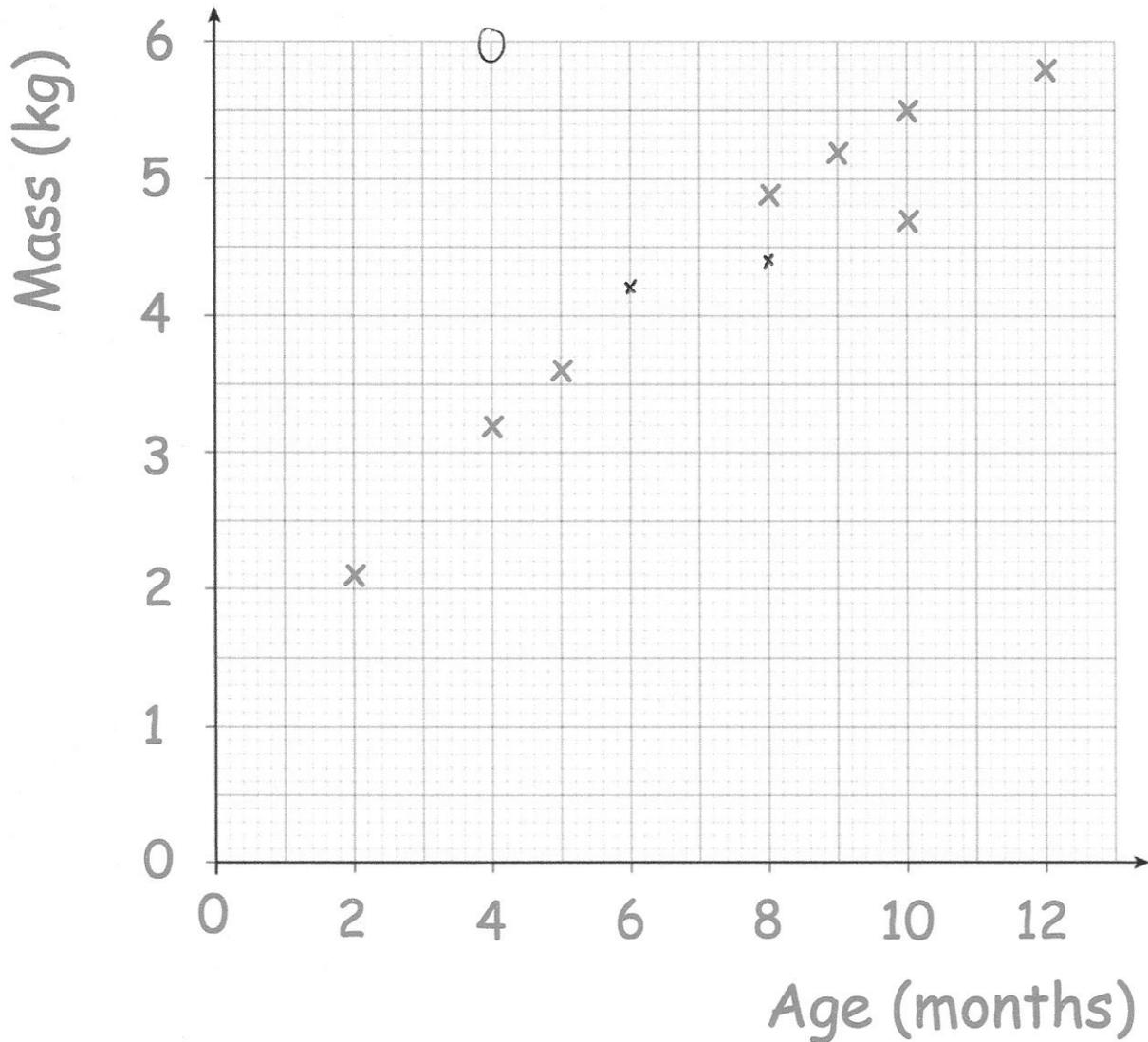
*140*  
£.....  
(1)

8. Samia records the ages and masses of 10 Jack Russell dogs.



Dog	A	B	C	D	E	F	G	H	I	J
Age (months)	4	10	12	5	8	10	2	9	6	8
Mass (kg)	3.2	4.7	5.8	3.6	4.9	5.5	2.1	5.2	4.2	4.4

The points for the first eight dogs have been plotted on the scatter graph below.



(a) Plot the points for the remaining two dogs.

(1)

An owner claims his Jack Russell is 4 months old and weighs 6kg

(b) Does the scatter graph support his statement?

Explain your answer.

No, it would be an outlier.

(1)

(c) Explain why the scatter graph should not be used to estimate the mass of a 8 month old Poodle.

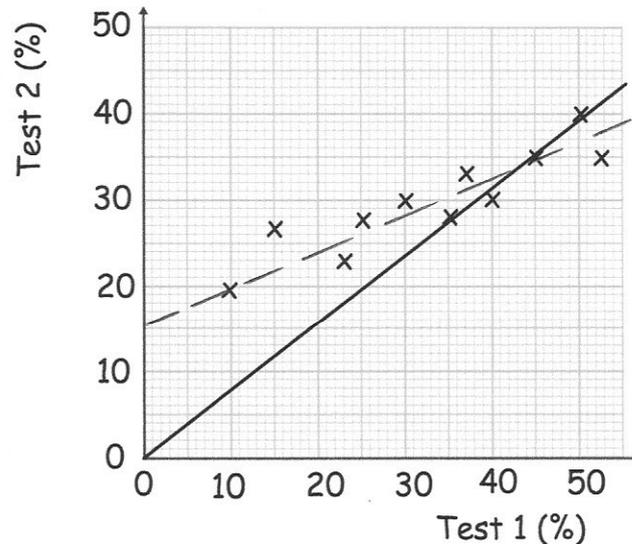
The scatter graph is for Jack Russells and not Poodles.

(1)

9. A class sits test 1 and test 2.



Arthur plots a scatter graph and draws a line of best fit.



Give a criticism of Arthur's line of best fit.

It does not need to go through (0,0).

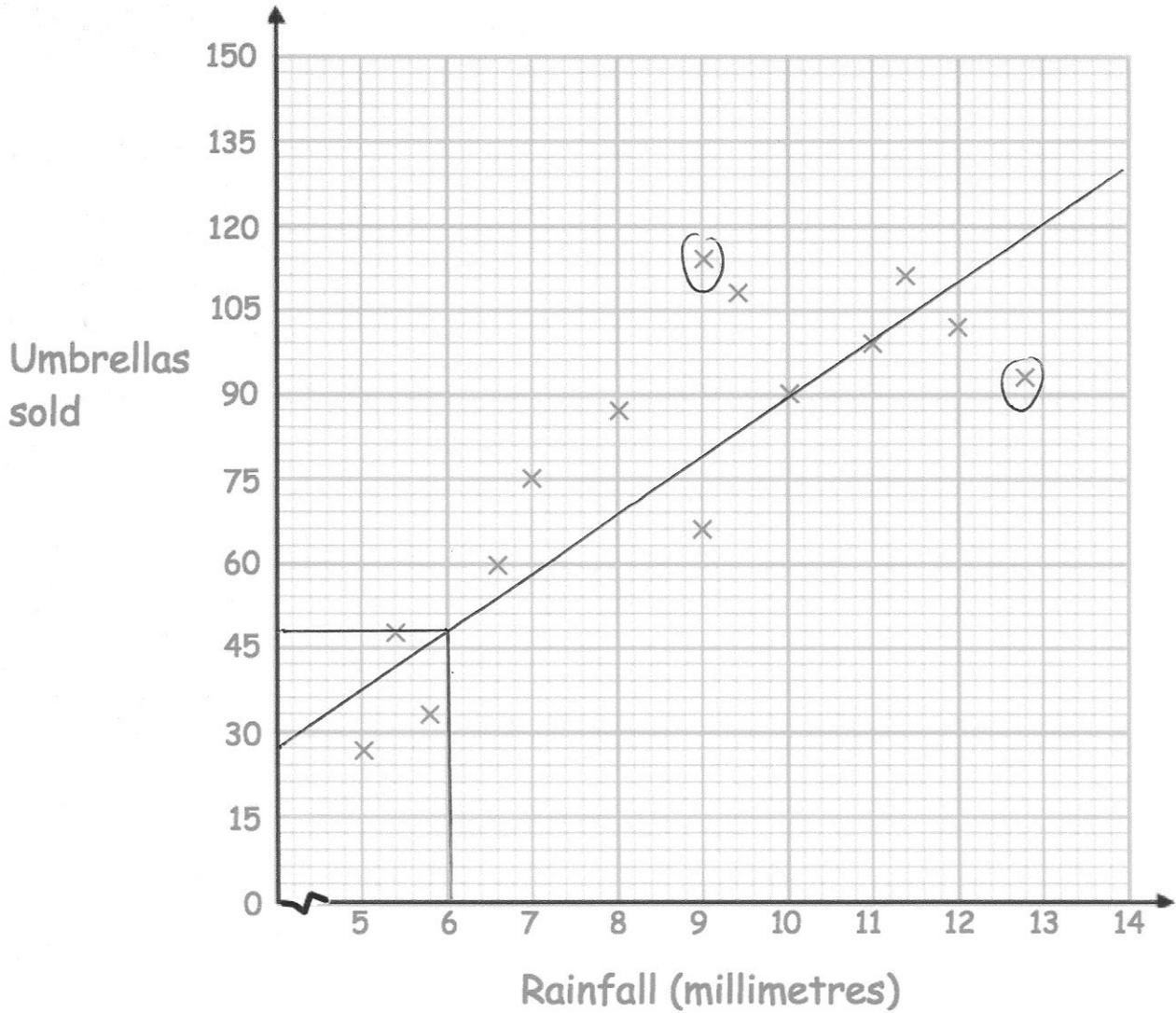
It could be a lot closer to the points.

(1)

10. A shop sells umbrellas.



The scatter graph shows information about the number of umbrellas sold each week and the rainfall that week, in millimetres.



(a) Describe the relationship between the rainfall and umbrellas sold.

As the rainfall increases, the number of umbrellas sold increase.

(1)

(b) What is the most number of umbrellas sold in one week?

114

(1)

(c) What is the greatest amount of rainfall in one week?

12.8mm  
.....  
(1)

(d) In how many weeks did the shop sell over 105 umbrellas?

3  
.....  
(1)

In another week, there was 6mm of rain.

(e) Estimate the number of umbrellas sold.

this may vary based on your line of best fit. 48  
.....  
(2)

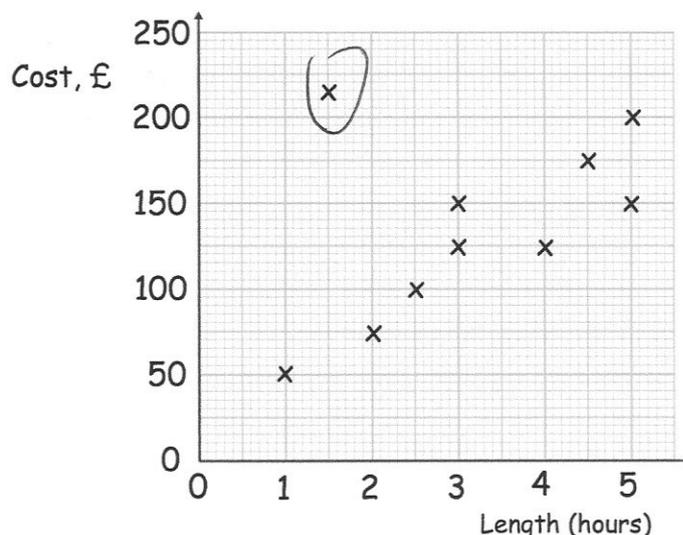
(f) Explain why it may **not** be appropriate to use your line of best fit to estimate the number of umbrellas sold in a week with 25mm of rainfall.

It is beyond the range of the data.  
It is extrapolation, therefore unreliable.  
.....  
(1)

11. Mr Hamill is a plumber.



The scatter graph shows the cost and length of his last 10 jobs.



Circle the outlier.

(1)

12. The table below shows information about the monthly rent of an apartment and the distance of the apartment from a city centre, in miles.

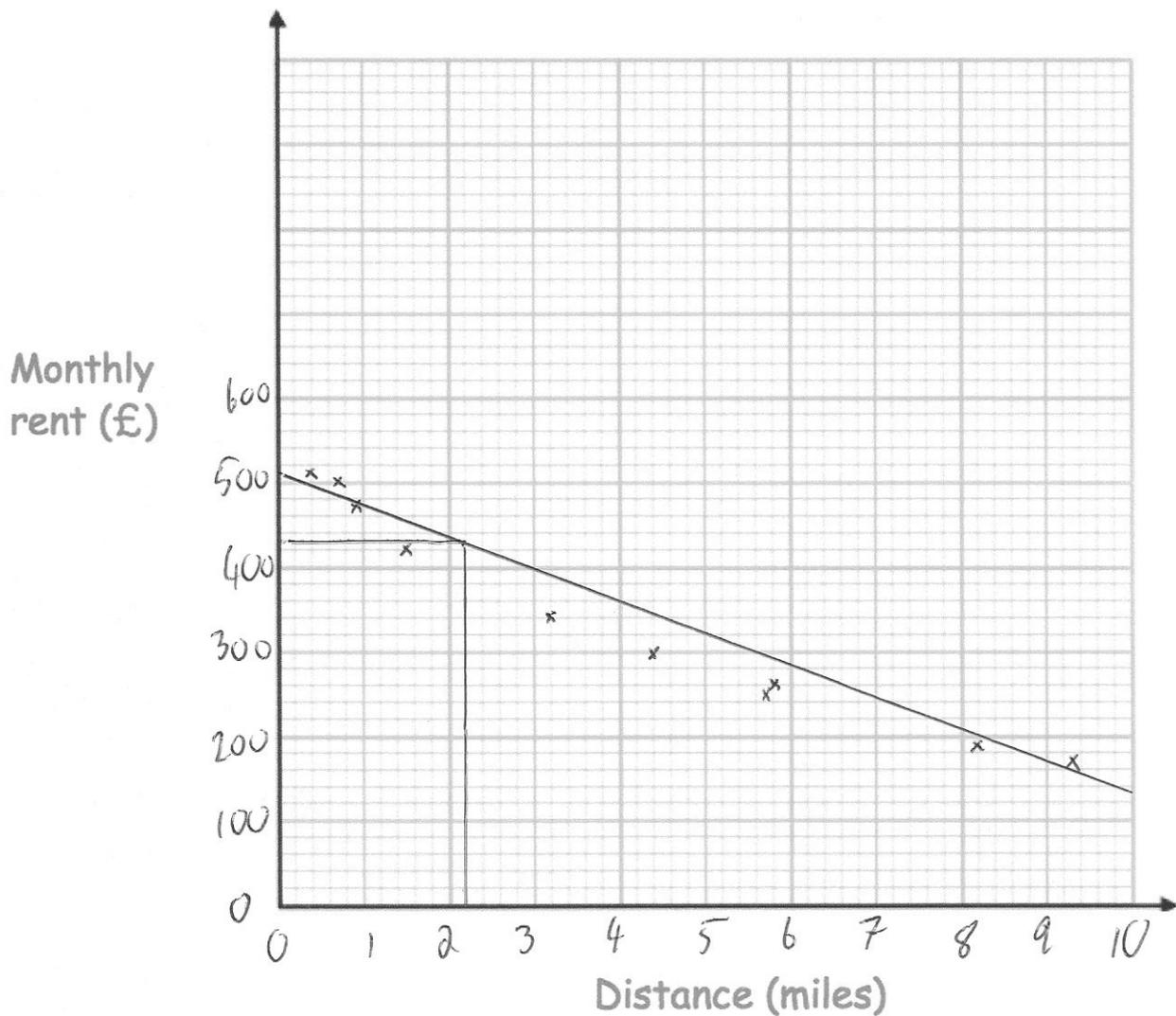


Distance (miles)	3.2	1.5	5.7	8.2	0.7	0.9	4.4	5.8	9.3	0.4
Monthly rent (£)	340	420	250	190	500	470	300	260	170	510

✓      ✓      ✓      ✓      ✓      ✓      ✓      ✓      ✓      ✓

- (a) Plot the data on the scatter graph below.  
Clearly label your axes.

(3)



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

As the distance increases, the monthly rent decreases.  
It is negative correlation.

(1)

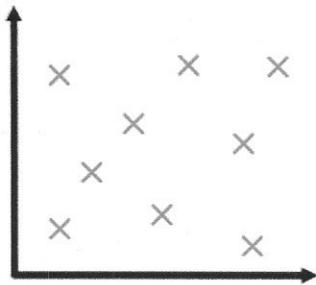
An apartment is 2.2 miles from the city centre.

(c) Find an estimate for the monthly rent

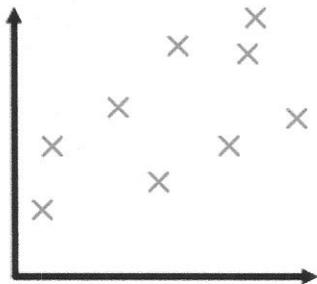
\* Answer depends on line of best fit.

£.....430.....  
(2)

13. Match each scatter graph to the best description of the type and strength of correlation.

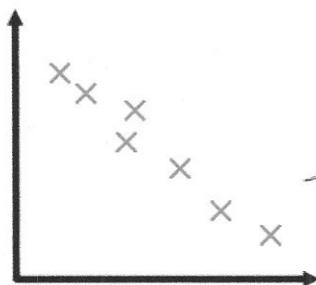


Strong positive correlation



Weak positive correlation

No correlation

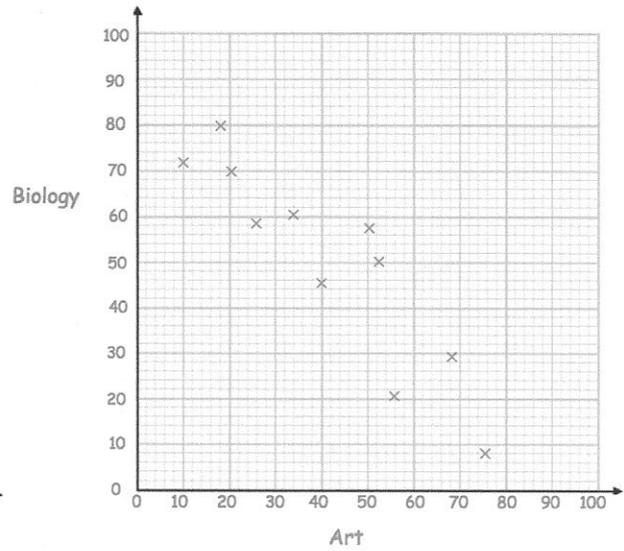
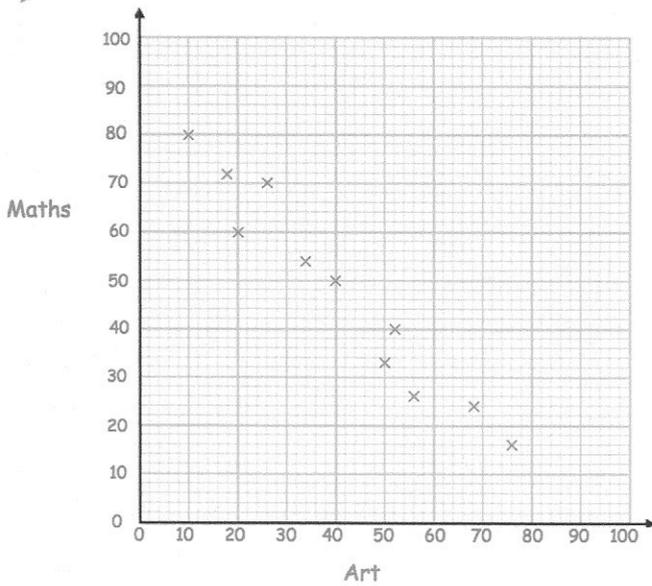


Weak negative correlation

Strong negative correlation

(2)

14. Eleven students sit examinations in Art, Maths and Biology. Information about the results are shown in the scatter graphs below.



- (a) Describe the correlation between the maths scores and art scores.

*negative correlation* ..... (1)

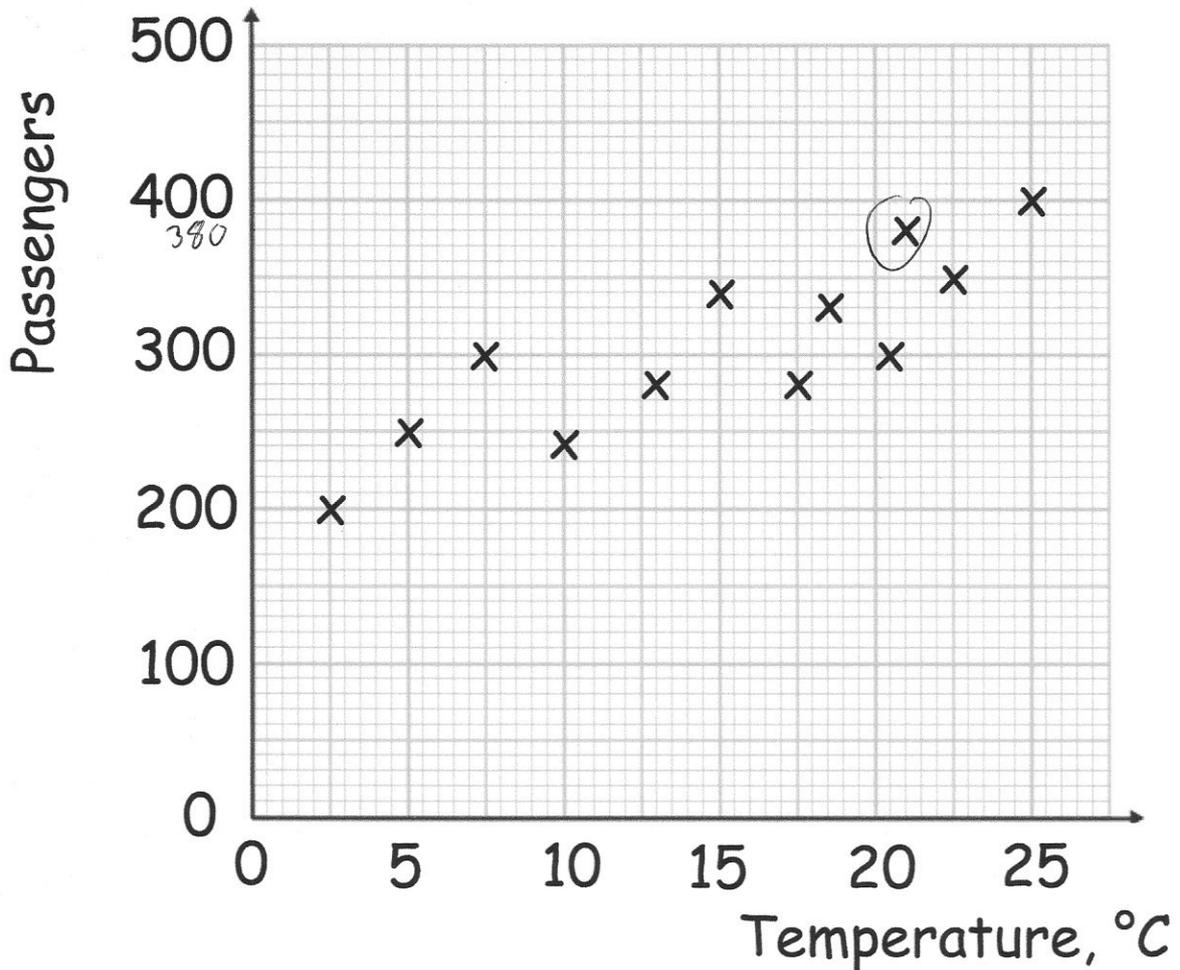
- (b) Describe the correlation between the biology scores and art scores.

*negative correlation* ..... (1)

- (c) Describe the correlation between the biology scores and maths scores.

*positive correlation* ..... (1)

15. The scatter graph shows information about the temperature and the number of passengers on 12 train journeys between a city and a seaside town.



Jessica was the driver for one of the 12 journeys.  
The temperature was 21°C

On that journey adult passengers : child passengers = 13 : 7

Work out how many of the passengers on that journey were children.

380 passengers

$$13 + 7 = 20$$

$$380 \div 20 = 19$$

$$19 \times 7 = 133$$

133

(4)