SCORE

Data & Measurement
with Classified
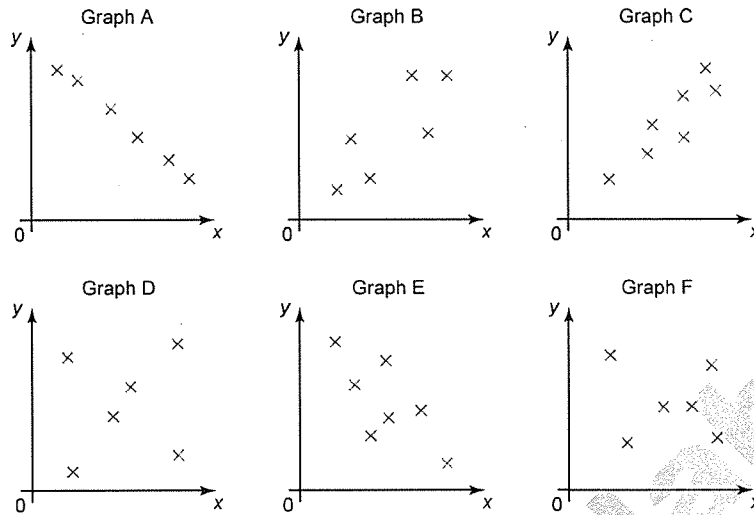### answer book

8

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4- Scatter Graphs

1   Here are six scatter graphs.
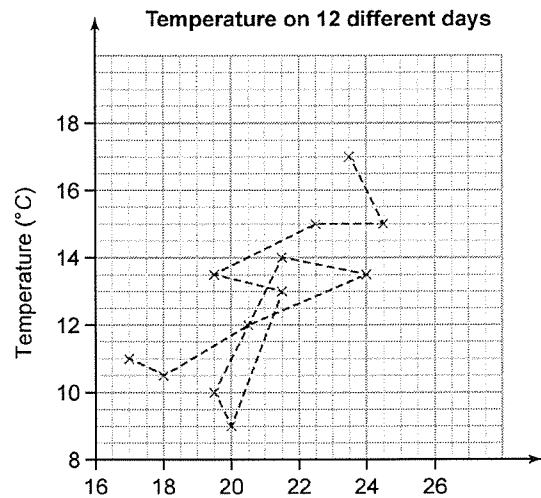
Graph A

Graph B

Graph C

Graph D

Graph E

Graph F

Copy and complete this table by writing each scatter graph in the correct column.

| Negative correlation	No correlation	Positive correlation

2.   Charlie records the temperature outside at midday and midnight on 12 different occasions.

He draws this diagram to show his results.

What has Charlie done wrong in drawing his scatter graph?

Temperature on 12 different days

3. A pupil investigated whether students who study more watch less television. .

The scatter graph shows his results. The line of best i.t is also shown.
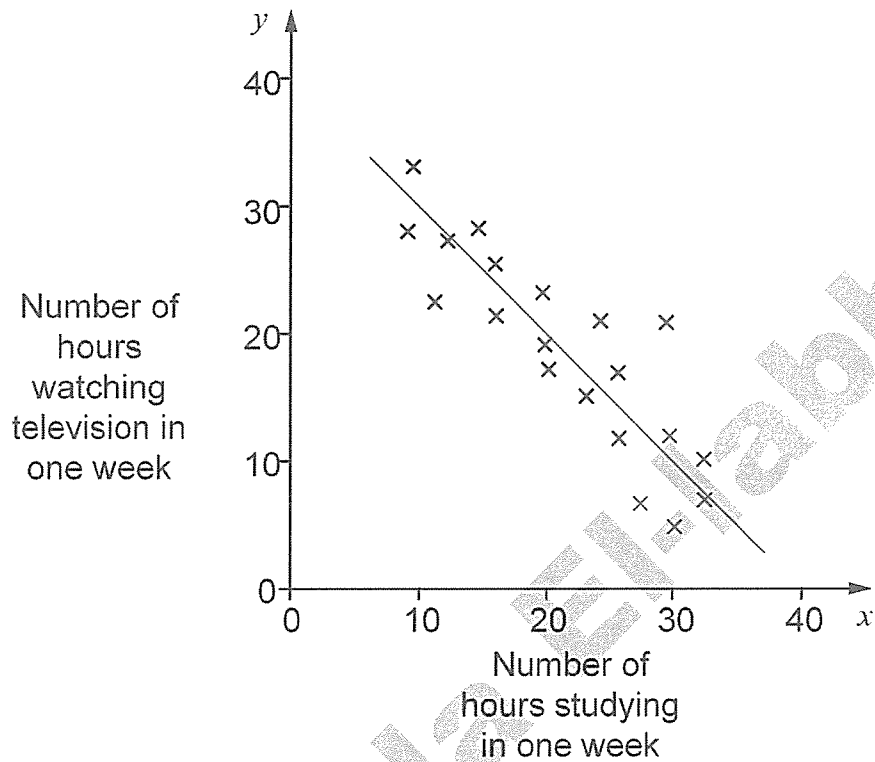
(a) What type of correlation does the graph show?

_____

(b) The pupil says the equation of the line of best i.t is $y = x + 40$

Explain how you can tell that this equation is **wrong**.

4. The scatter graph shows some information about 8 cars.
For each car it shows the engine size, in litres, and the distance, in kilometres, the car travels on one litre of petrol.
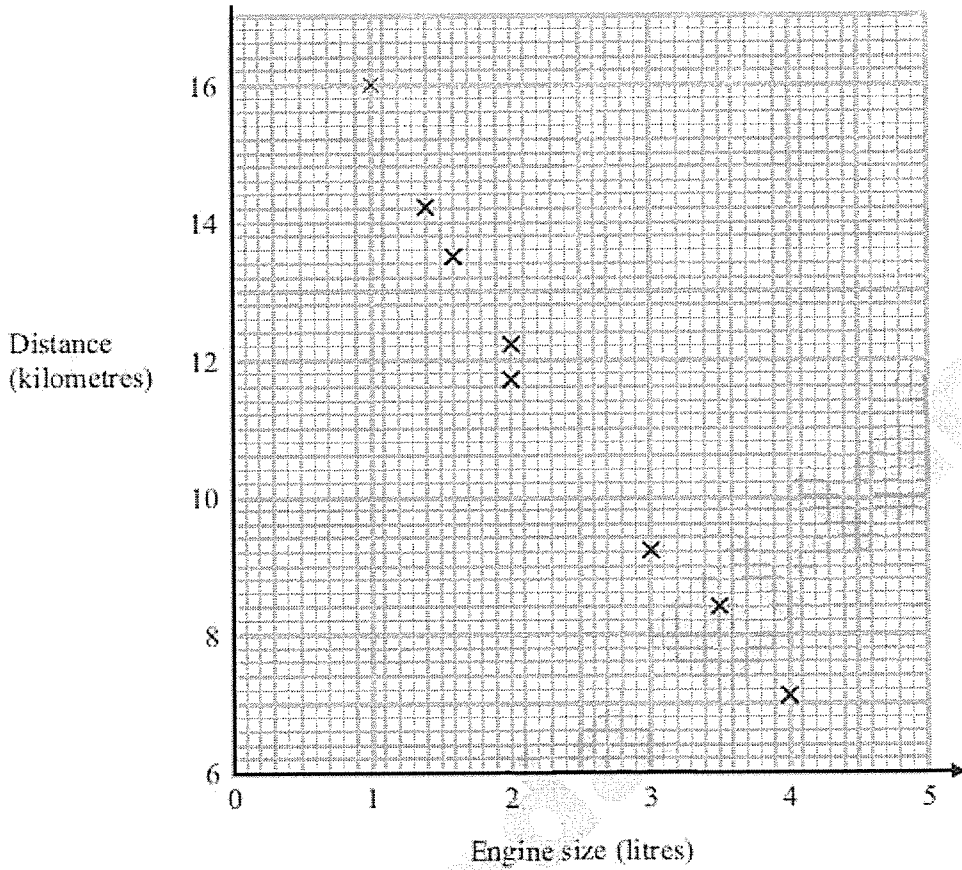
(a) What type of correlation does the scatter graph show?

....
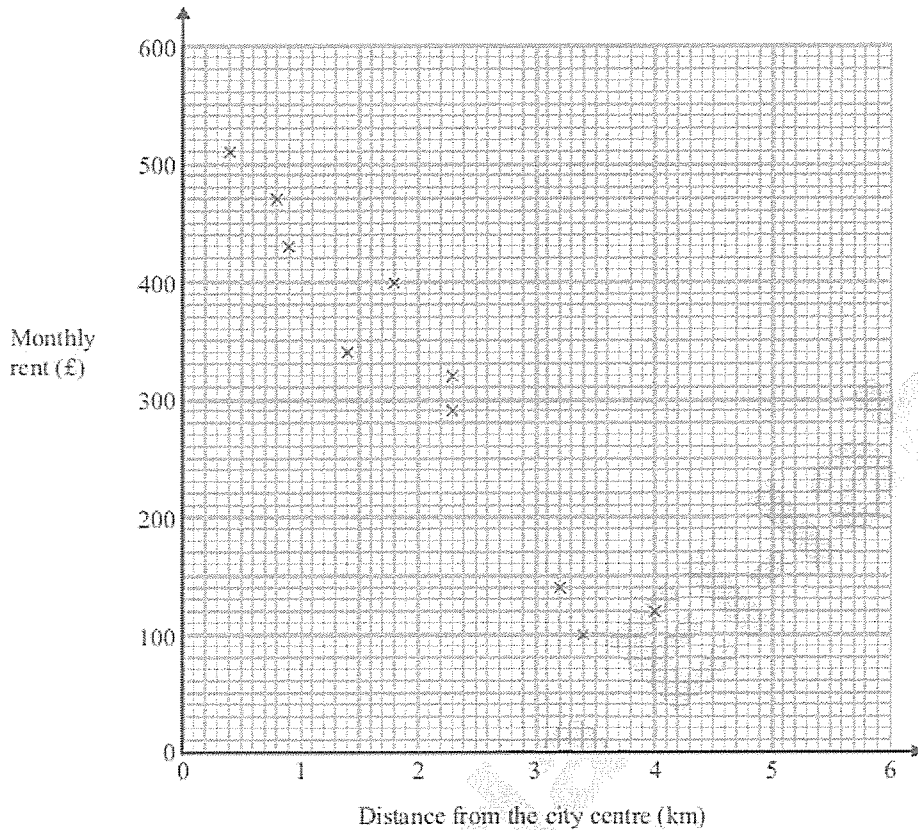............

A different car of the same type has an engine size of 2.5 litres.

(b) Estimate the distance travelled on one litre of petrol by this car.

....
kilometres

5. 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

(a) On the scatter graph, plot the information from the table.

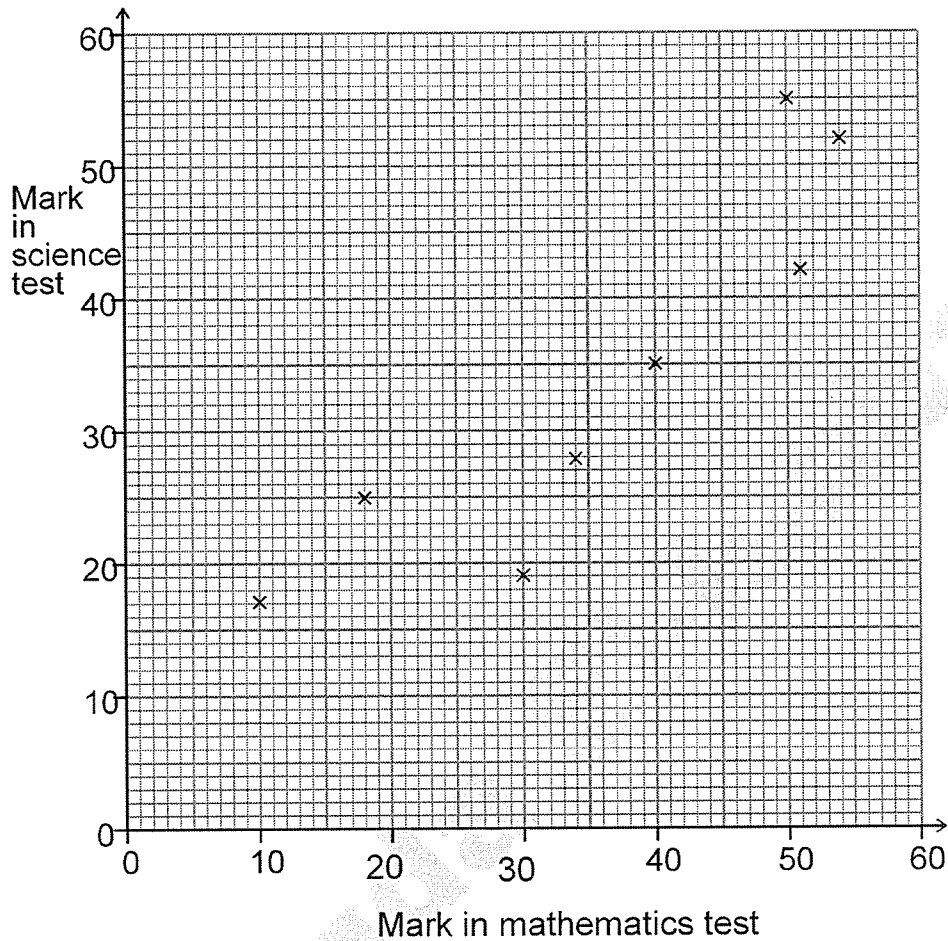(b) Describe the relationship between the distance from the city centre and the monthly rent.

....

....

An apartment is 2.8 km from the city centre.

(c) Find an estimate for the monthly rent for this apartment.

£ ....

6. Some students took a mathematics test and a science test.
The scatter graph shows information about the test marks of eight students.

Mark in mathematics test

The table shows the test marks of four more students.

Mark in mathematics test	14	25	50	58
Mark in science test	21	23	38	51

(a) On the scatter graph, plot the information from the table.

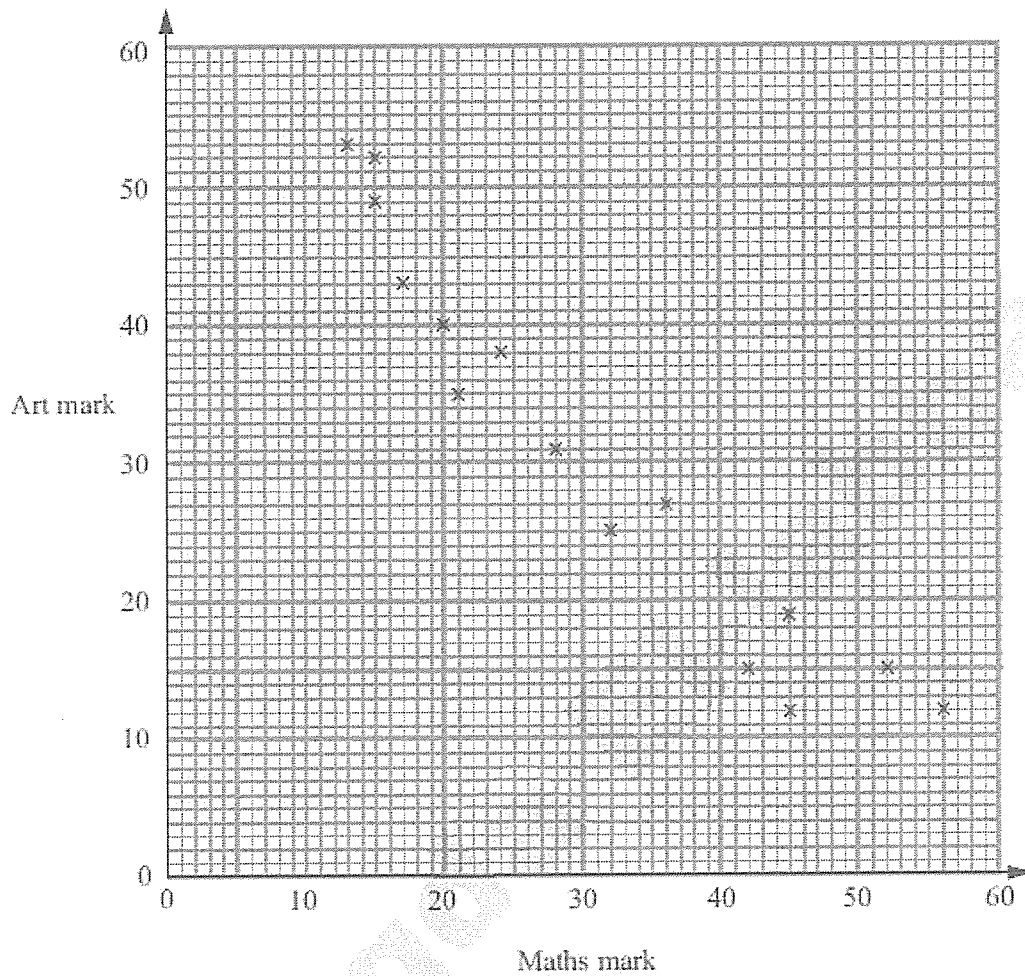(b) Describe the correlation between the marks in the mathematics test and the marks in the science test.

....

Josef was absent for the mathematics test but his mark in the science test was 45

(c) Estimate Josef's mark in the mathematics test.

....

7. The scatter graph shows the maths mark and the art mark for each of 15 students.

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

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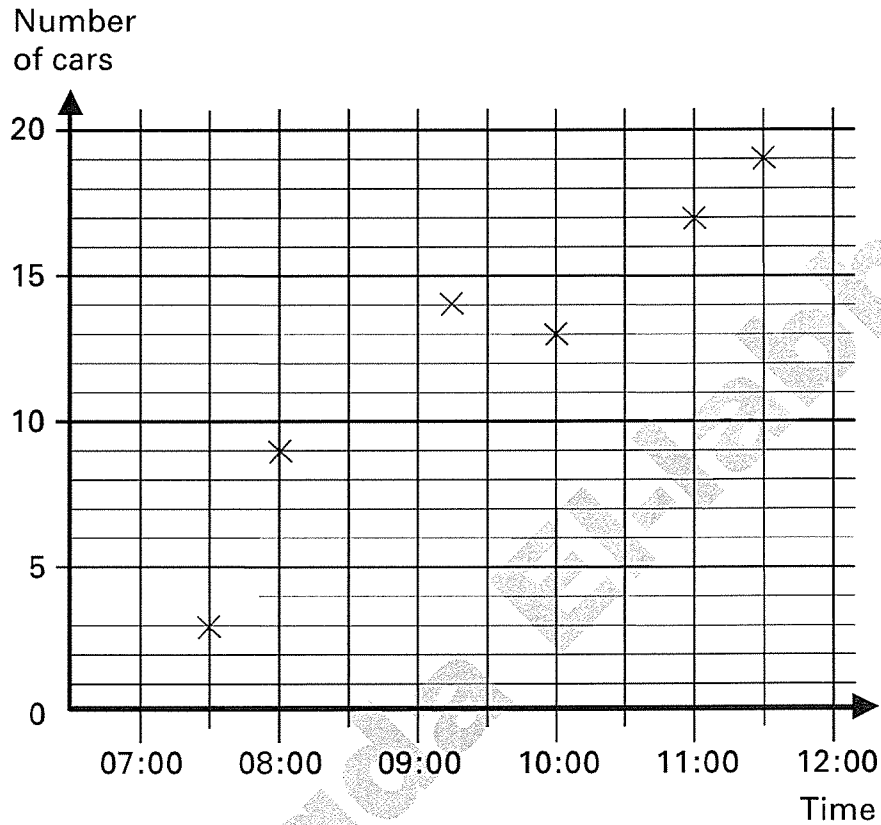
(b) Draw a line of best fit on the scatter graph.·

Sarah has not got a maths mark.
Her art mark is 23

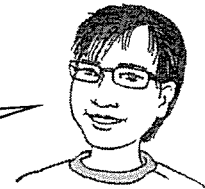(c) Use your line of best fit to estimate a maths mark for Sarah.

....

8. Esha counted the number of cars in a car park at different times one morning.

She drew this graph to show her data.

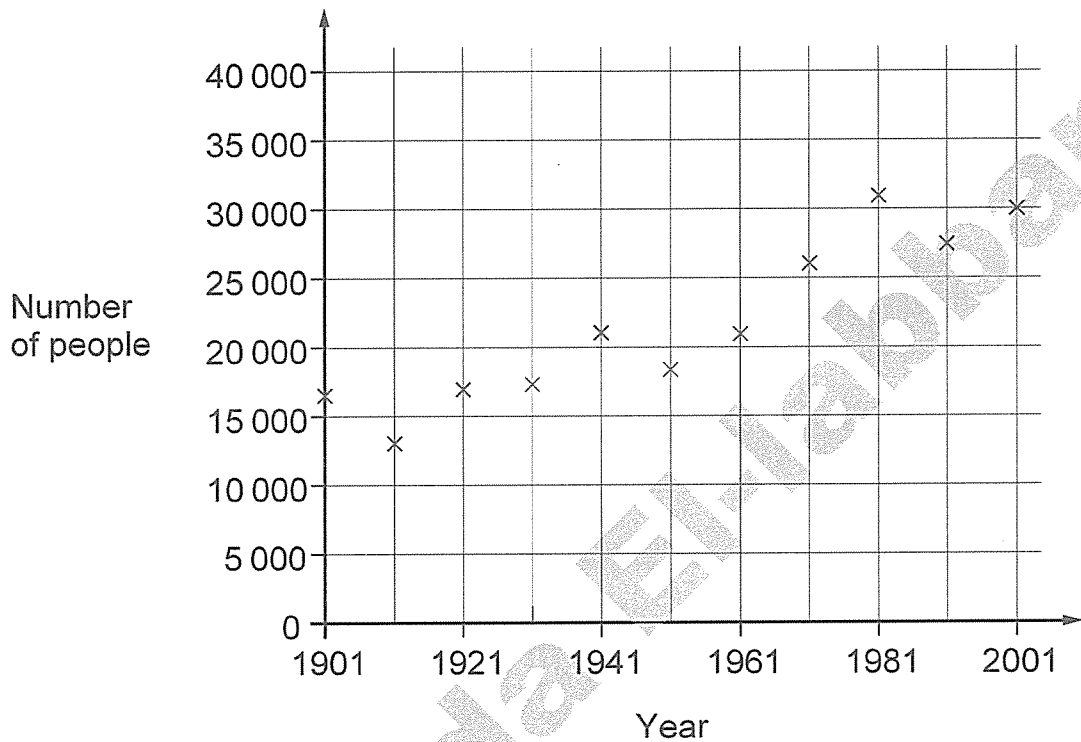Number of cars vs Time graph with points plotted.

Jack says:

Esha's graph shows that there were 15 cars in the car park at 10:30

Explain why Esha's graph does not show this.

9. Every ten years the government collects information in a survey about people in this country.

The graph shows some of the information about a town called Tinworth.

(a) About how many people lived in Tinworth in **1911**?

....

(b) The number of people in 1911 **doubled** by what year?
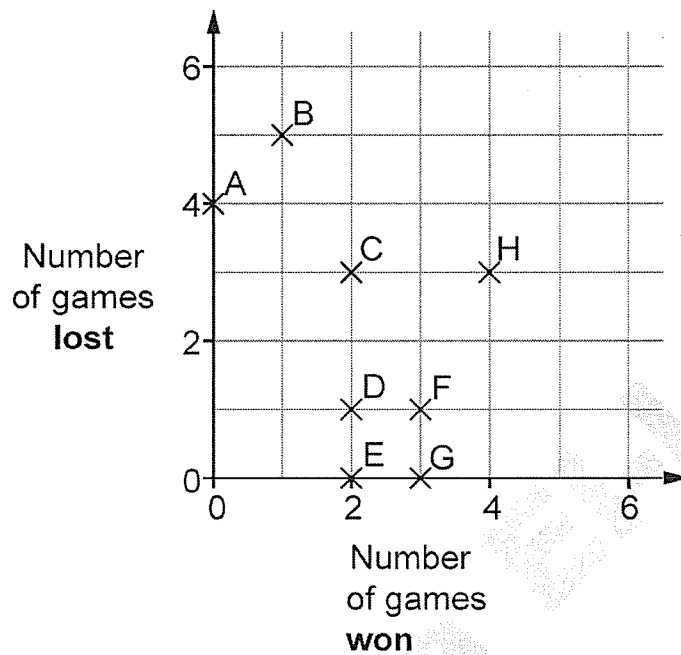
....

(c) Generally the number of people increased.

How many times did the number of people **decrease** between surveys?

.... times

10. 8 people took part in a chess competition.

The diagram shows how many games each person won, and how many games each person lost.

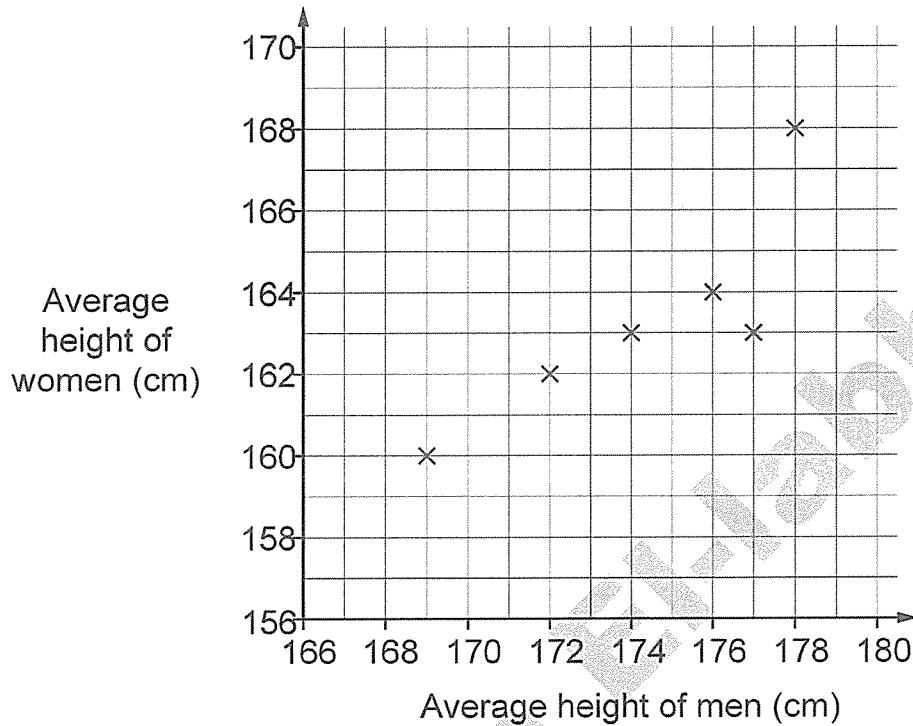(a) Who won the most games? Write the person's letter.

_____

(b) How many games were won by person **A**?

_____

(c) Each person played **7 games**.

Each game was won, lost or drawn.

How many of person **D**'s games were **drawn**?

_____

11. The diagram shows average heights of men and women in six different countries.

Average height of women (cm)

Average height of men (cm)

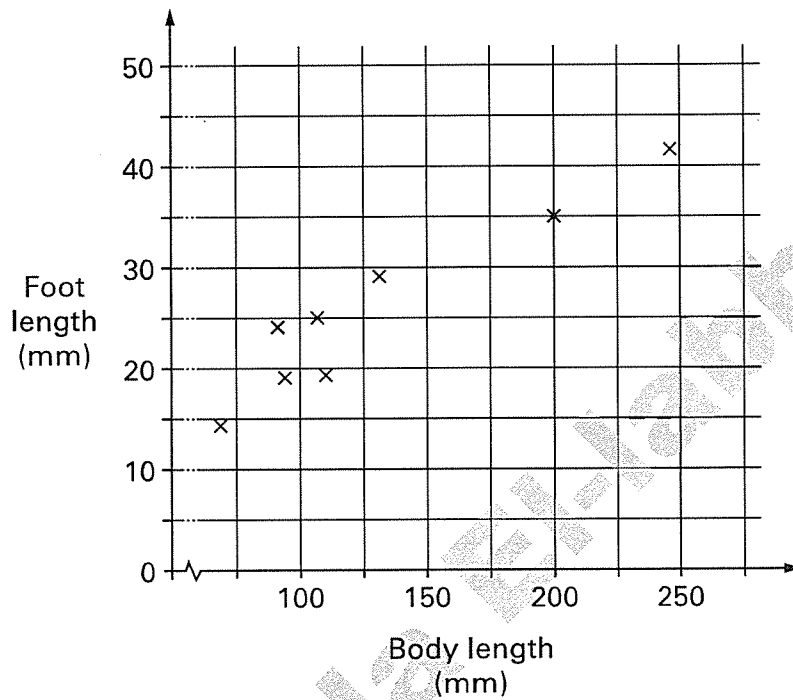(a) In one country the average height of **men** is **172cm**.

What is the average height of **women** in this country?

_____ cm

(b) In another country the average height of **men** is **12cm more** than the average height of **women**.

On the graph, **put a ring round** the cross for this country.

12. The scatter graph shows the average body length and average foot length of different species of rodents.

(a) What does the scatter graph tell you about the **type of correlation** between the body length and foot length for these rodents?

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

(c) If body length increased by **50mm**, by approximately how many millimetres would you expect foot length to increase?
Ring the correct value below.

   2   7   15   50   275

13. The scatter graph shows 15 pupils' coursework and test marks.
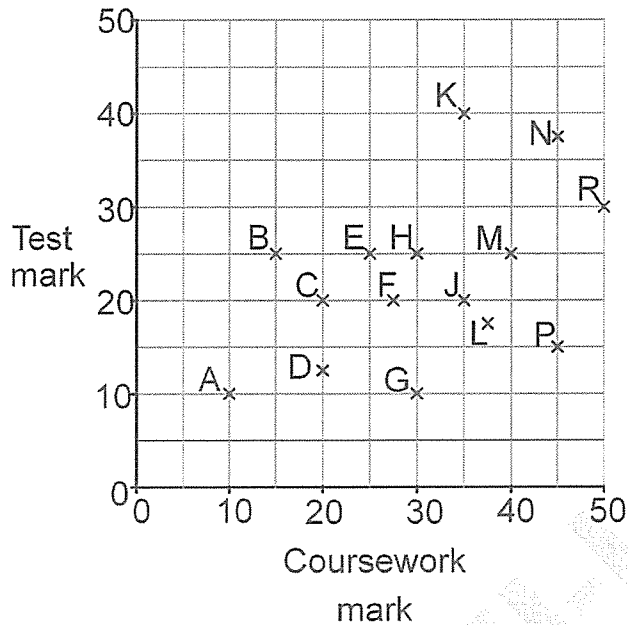
To find a pupil **total** mark, you add the coursework mark to the test mark.

(a) Which pupil had the highest **total** mark?

_____

(b) Look at the statement below. Tick (✓) True or False.

The range of coursework marks was greater than the range of test marks.
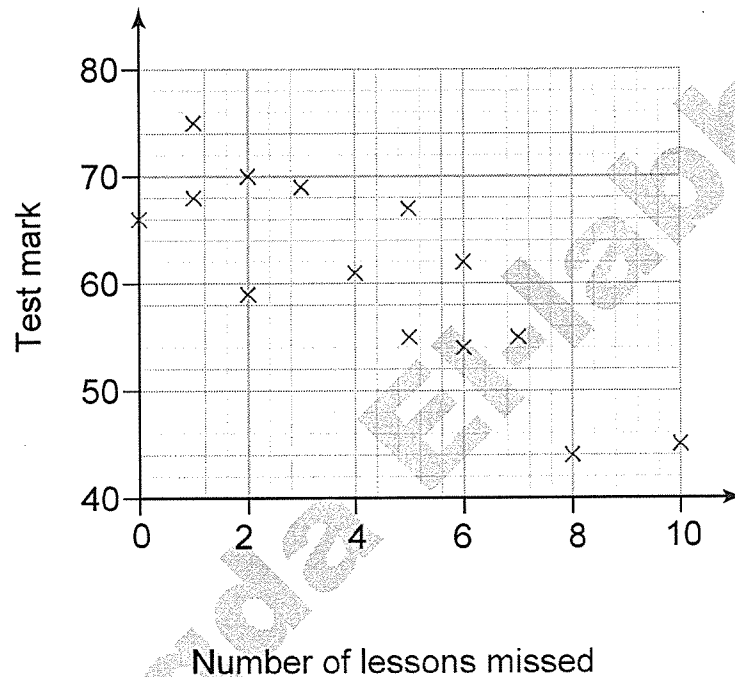
☐ True   ☐ False

Explain your answer.

14. Andy is a teacher.

He has this conjecture:

Students who miss more lessons do less well in a test.

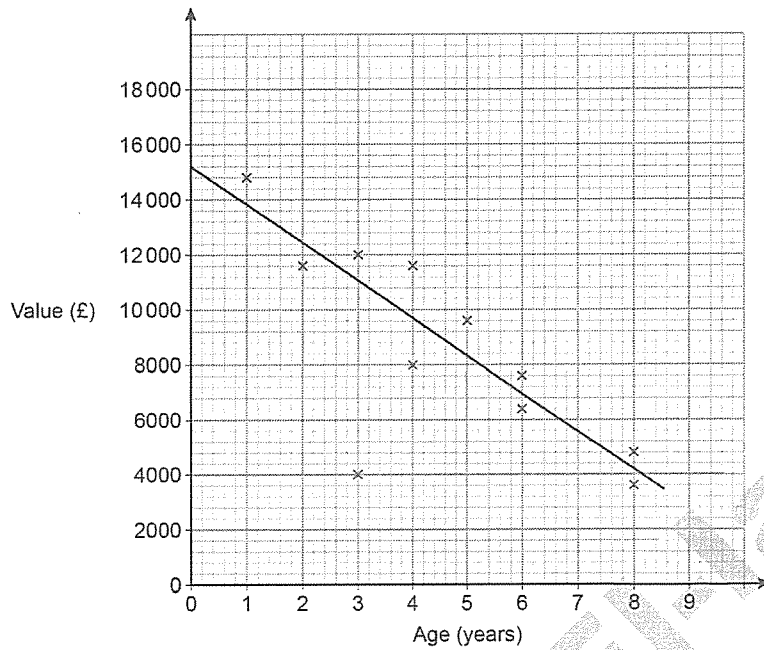He collects data from students in his class and draws a scatter graph.

Number of lessons missed and test marks

Number of lessons missed

Comment on whether Andy's data support his conjecture or not.

15 The scatter diagram shows the age and value of some cars in 2019 All the cars were of the same make and model.

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

_____

(b) Write down the value of the car that was an outlier.

£ _____

**(c)** Use the graph to estimate the value of a new car of this make and model in 2019

£ _____

(d) A car of this make and model had a value of £5600 in 2019

Use the graph to estimate the year in which it was made.

_____

16 The upper arm is the part of the arm between the shoulder and the elbow.

Jackie wishes to investigate the relationship between the length of the upper arm and height in young children.

She takes measurements from 10 children and draws this scatter graph.

Length of upper arm (cm)
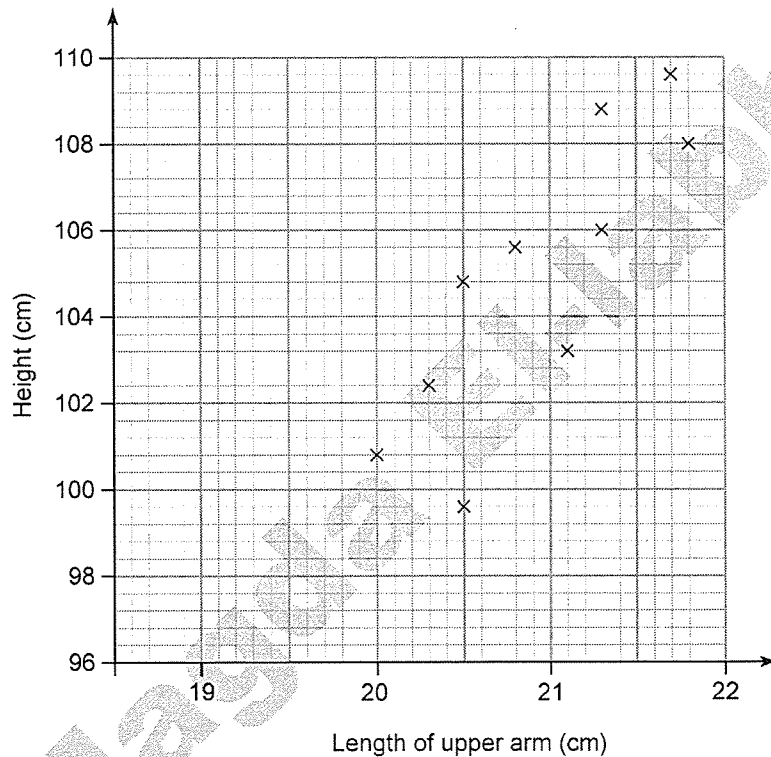
Is each statement true or false?

	True	False
Four of the children had an upper arm length greater than 21 cm.	☐	☐
The scatter graph shows positive correlation.	☐	☐
Children with a longer upper arm tend to be taller than children with a shorter upper arm.	☐	☐