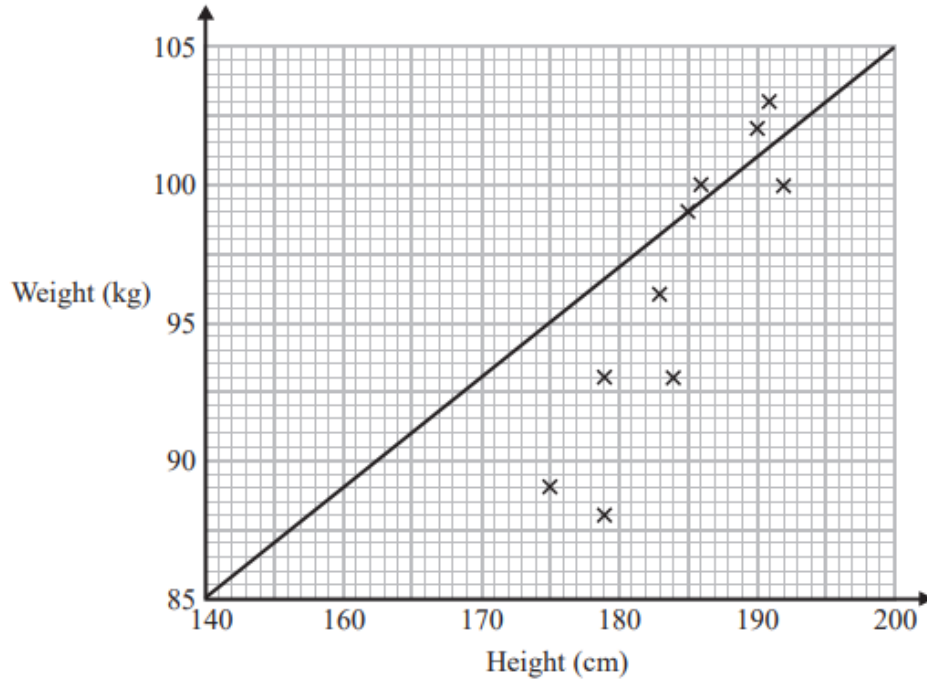**SCATTER GRAPHS**

Pearson Edexcel - Thursday 8 November 2018 - Paper 2 (Calculator) Foundation Tier

1.

21 Sean has information about the height, in cm, and the weight, in kg, of each of ten rugby players.

He is asked to draw a scatter graph and a line of best fit for this information.

Here is his answer.

Sean has plotted the points accurately.

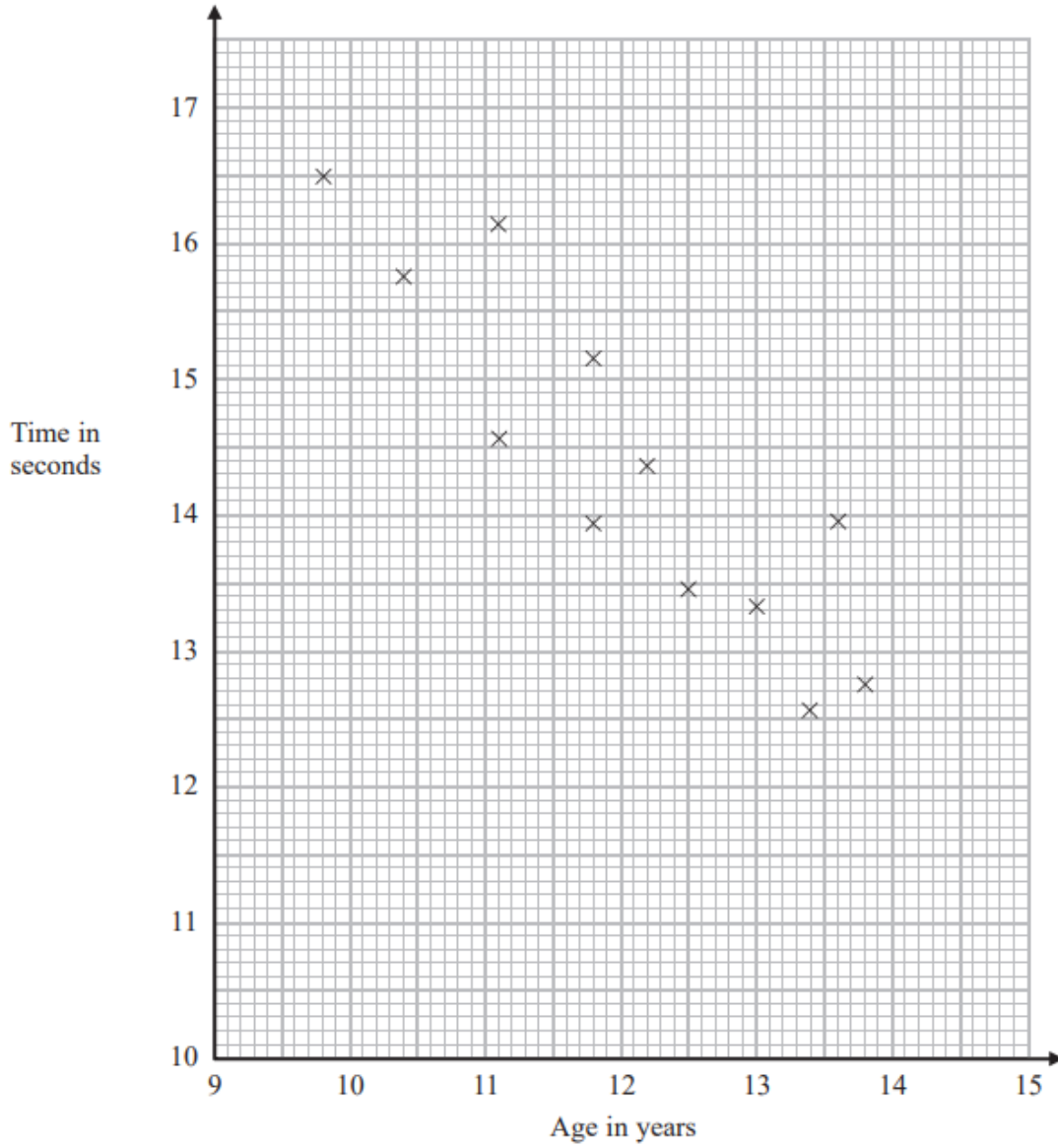Write down two things that are wrong with his answer.

1 ....

....

2 ....

....

(Total for Question 21 is 2 marks)

2.

19 The scatter diagram shows information about 12 girls.

It shows the age of each girl and the best time she takes to run 100 metres.

(a) Write down the type of correlation.

....

(1)

Kristina is 11 years old.
Her best time to run 100 metres is 12 seconds.

The point representing this information would be an outlier on the scatter diagram.

(b) Explain why.

....

....

(1)

Debbie is 15 years old.
Debbie says,
    "The scatter diagram shows I should take less than 12 seconds to run 100 metres."
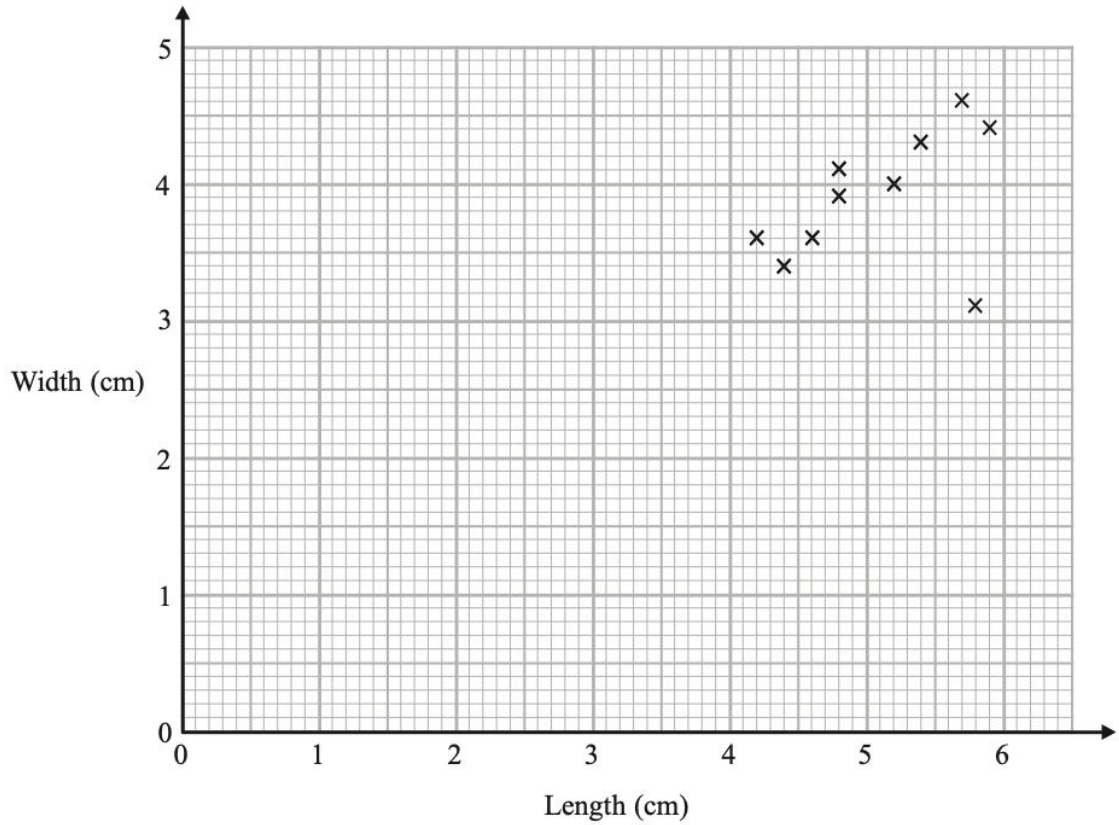
(c) Comment on what Debbie says.

....

....

(1)

(Total for Question 19 is 3 marks)

3.

26 Katie measured the length and the width of each of 10 pine cones from the same tree.

She used her results to draw this scatter graph.

(a) Describe one improvement Katie can make to her scatter graph.

....

....

(1)

The point representing the results for one of the pine cones is an outlier.

(b) Explain how the results for this pine cone differ from the results for the other pine cones.
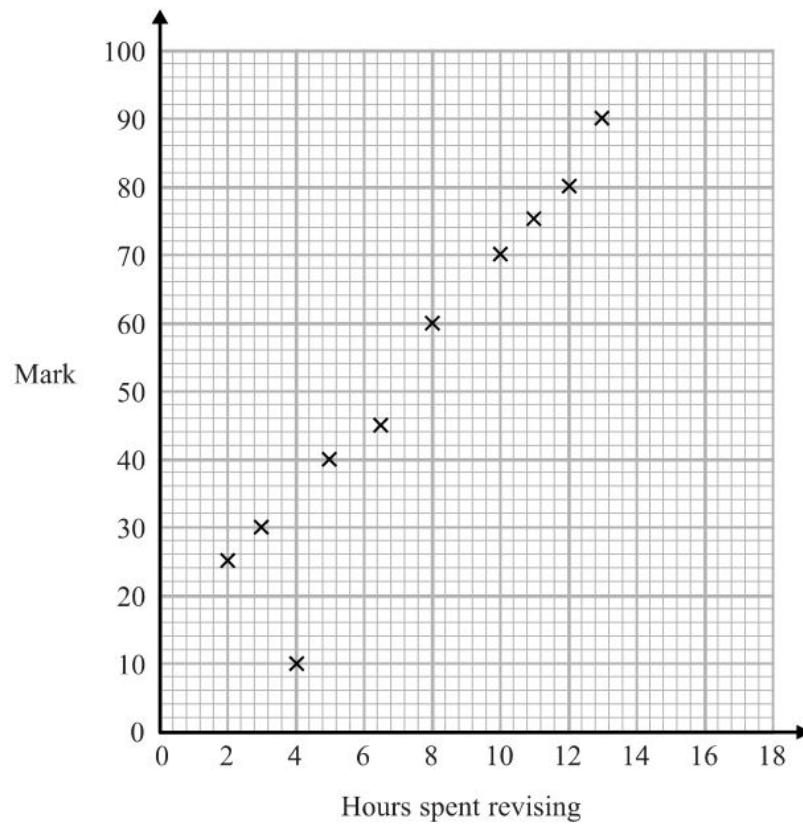
....

....

(1)

(Total for Question 26 is 2 marks)

4.

21 The scatter diagram shows information about 10 students.

For each student, it shows the number of hours spent revising and the mark the student achieved in a Spanish test.

One of the points is an outlier.

(a) Write down the coordinates of the outlier.

....

(1)

For all the **other** points

(b) (i) draw the line of best fit,

(ii) describe the correlation.

....

....

(2)

A different student revised for 9 hours.

(c) Estimate the mark this student got

....

(1)

The Spanish test was marked out of 100

Lucia says,

"I can see from the graph that had I revised for 18 hours I would have got full marks."
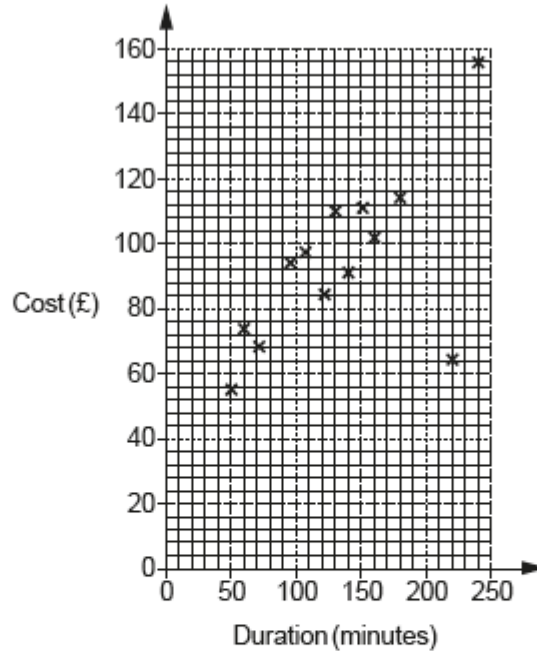
(d) Comment on what Lucia says.

....

....

(1)

(Total for Question 21 is 5 marks)

5.

14 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.

(a) 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]

(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]

(c) (i) Draw a line of best fit on the scatter diagram. [1]

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

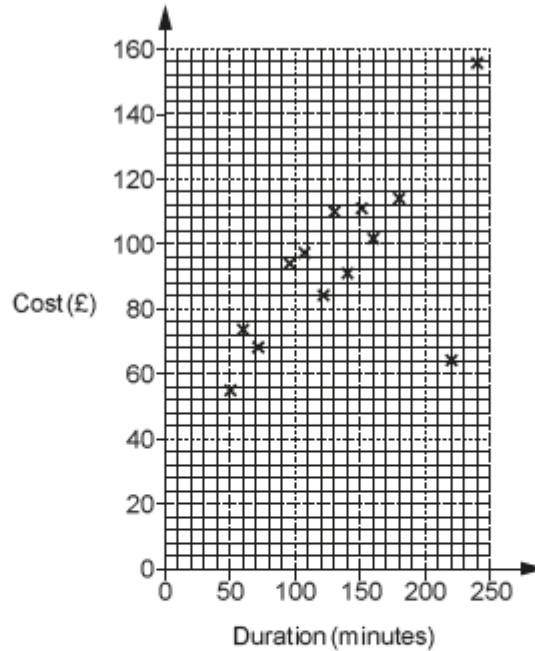(c)(ii) .... minutes [1]

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

....

....

.... [1]

6.

14 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.

Cost (£)

Duration (minutes)

(a) 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]**

(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]**

(c) **(i)** Draw a line of best fit on the scatter diagram. **[1]**

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

(c)(ii) .... minutes **[1]**

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

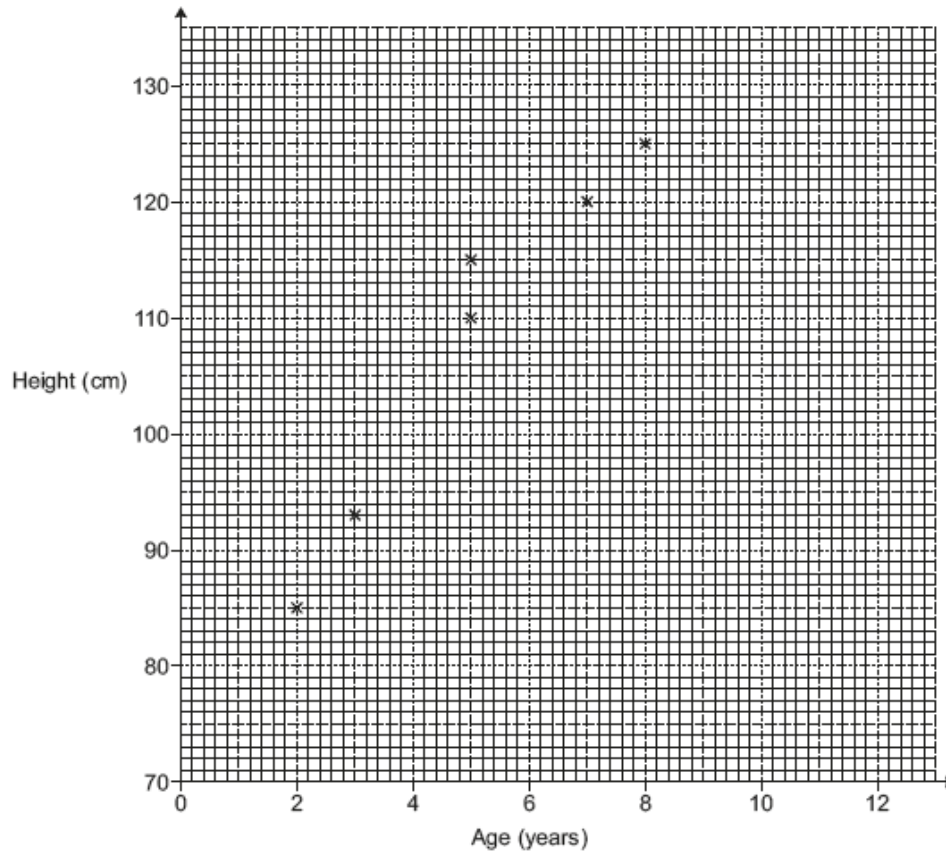...

....

.... **[1]**

7.

11 A doctor records the ages, in years, and the heights, in centimetres, of 10 girls.

Age (years)	2	5	3	7	5	8	3	6	9	4
Height (cm)	85	115	93	120	110	125	90	117	127	103

The points for the first six girls are plotted on the scatter diagram.

(a) Plot the points for the remaining four girls. [2]

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

.... [1]

(c) The doctor says that by using a line of best fit on the scatter diagram, the height of a 6-year-old girl is around 95 cm.

Does the scatter diagram support the doctor's statement?
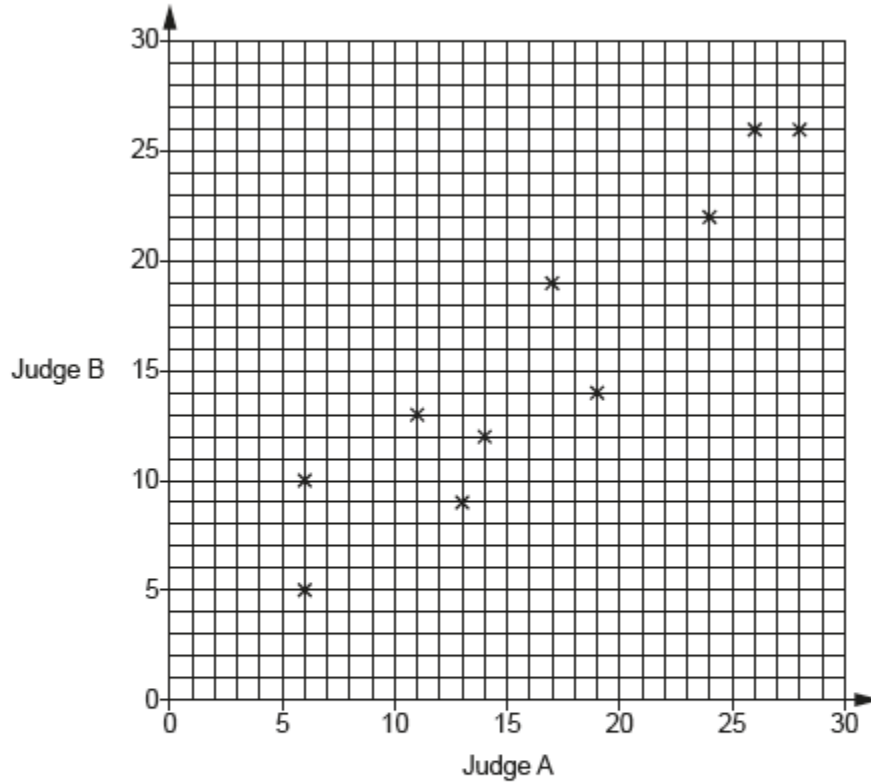Explain your reasoning.

....

.... **[2]**

(d) Explain why the scatter diagram and line of best fit should not be used to estimate the height of a 12-year-old girl.

....

.... **[1]**

8.

16 In a dance competition, two judges each award scores out of 30.
The scatter diagram shows the scores awarded to the first 10 dancers.

Judge A

(a) Here are the scores for the next two dancers.

| Judge A	21	7
Judge B	18	8

Plot their scores on the scatter diagram. [1]

(b) Dancers who are awarded a score of more than 20 by **both** judges receive a medal.

For the 12 dancers, express the ratio of medal winners to non-medal winners in its simplest form.

(b) .... : .... **[3]**

(c) This chart shows the types of dance performed by the 12 dancers.

3 performed a street dance, 8 performed a jazz dance and 1 performed a tap dance.
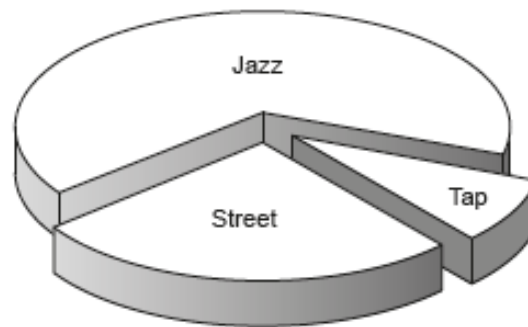
Why is this diagram misleading?

....

....

.... **[1]**

9.

15 Lee wishes to find out if there is a relationship between a person's age and the time it takes them to complete a puzzle.

Lee decides to conduct an experiment.
She asks 12 people to complete the puzzle.
She records each person's age and the time taken to complete the puzzle.

(a) Make one criticism of Lee's method.

....

.... **[1]**

This scatter diagram shows the results for ten of the people in Lee's experiment.
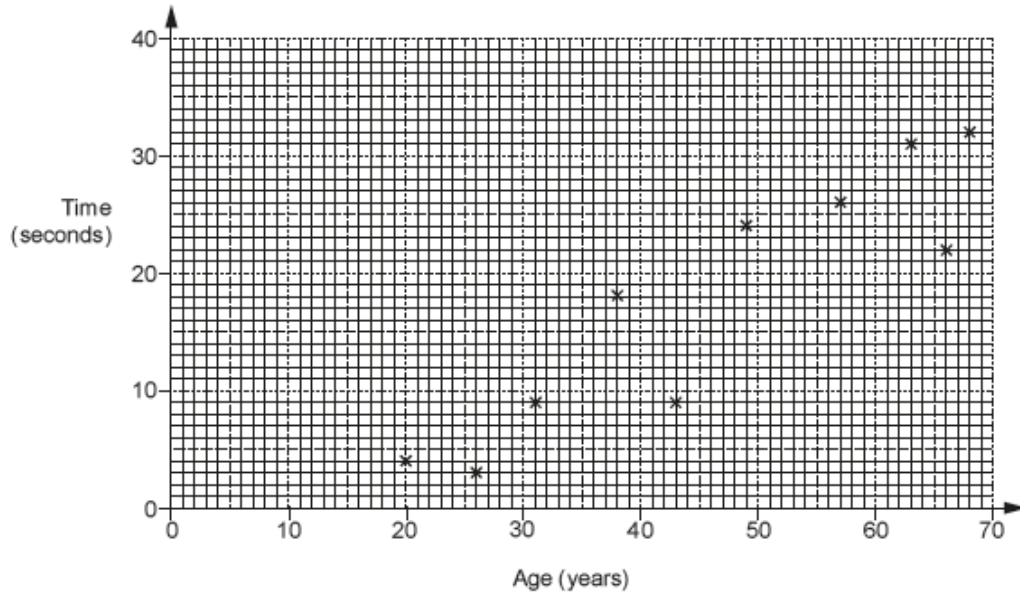
(b) Here are the other two results.

Age (years)	47	60
Time (seconds)	21	34

Plot these results on the scatter diagram. **[2]**

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

(c) .... **[1]**

(d) Estimate the time it would take a person aged 35 to complete the puzzle.
Show your working to justify your answer.

(d) .... **[2]**

(e) Lee says that at least 80% of the 12 people completed the puzzle in under 30 seconds.

Is Lee correct?
Show working to support your answer.

.... **[3]**

10.

17 The scatter diagram shows the results of 17 students in their French test and their German test. Both tests are out of 100.

German test

French test
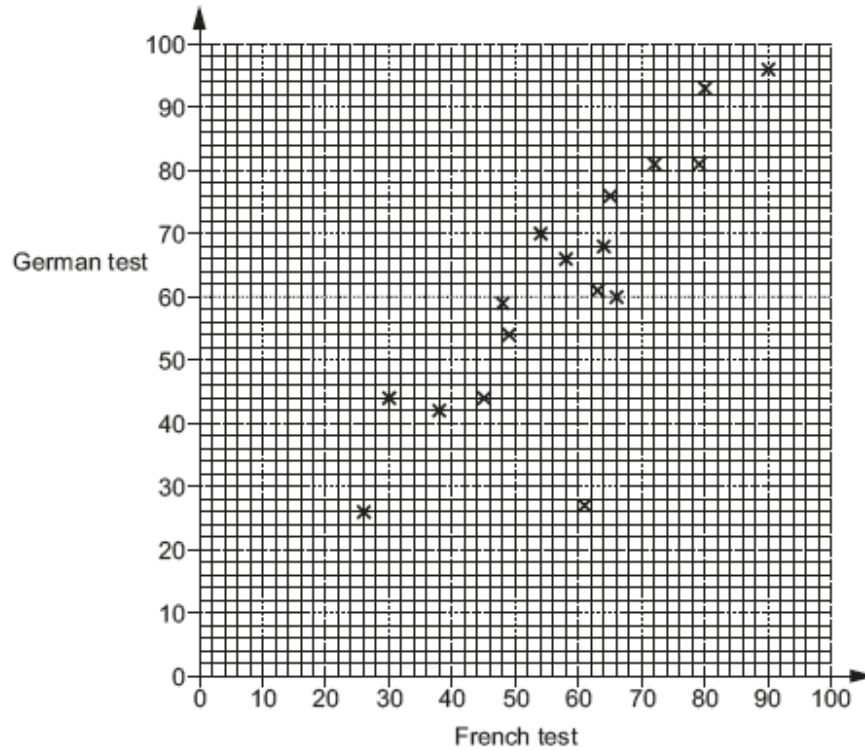
(a) Here are the results of another 4 students.

French	21	75	48	53
German	30	78	46	61

Plot these results on the scatter diagram. [2]

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

(b) .... [2]

(c) Work out the percentage of the students whose German result was **higher** than their French result.

(c) .... % [4]

11.

21 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.
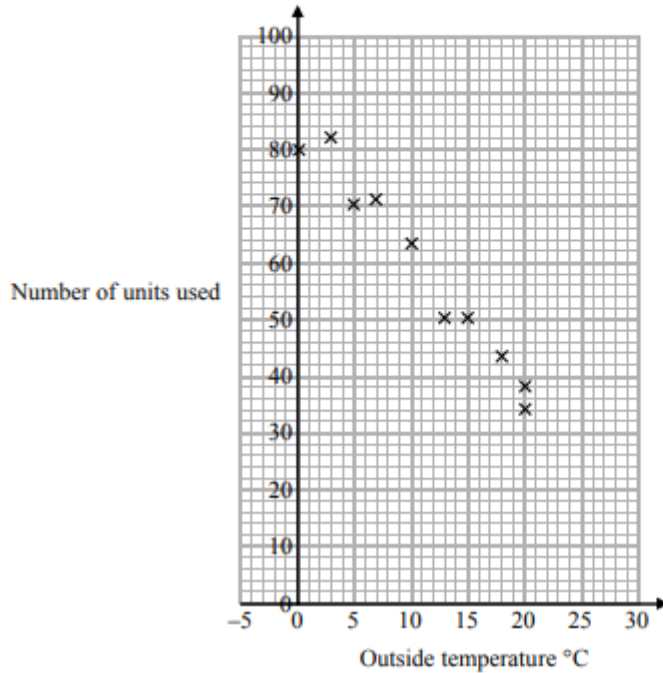
Molly says,

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

(a) Is Molly right?
Show how you get your answer.

....

....

(3)

(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.
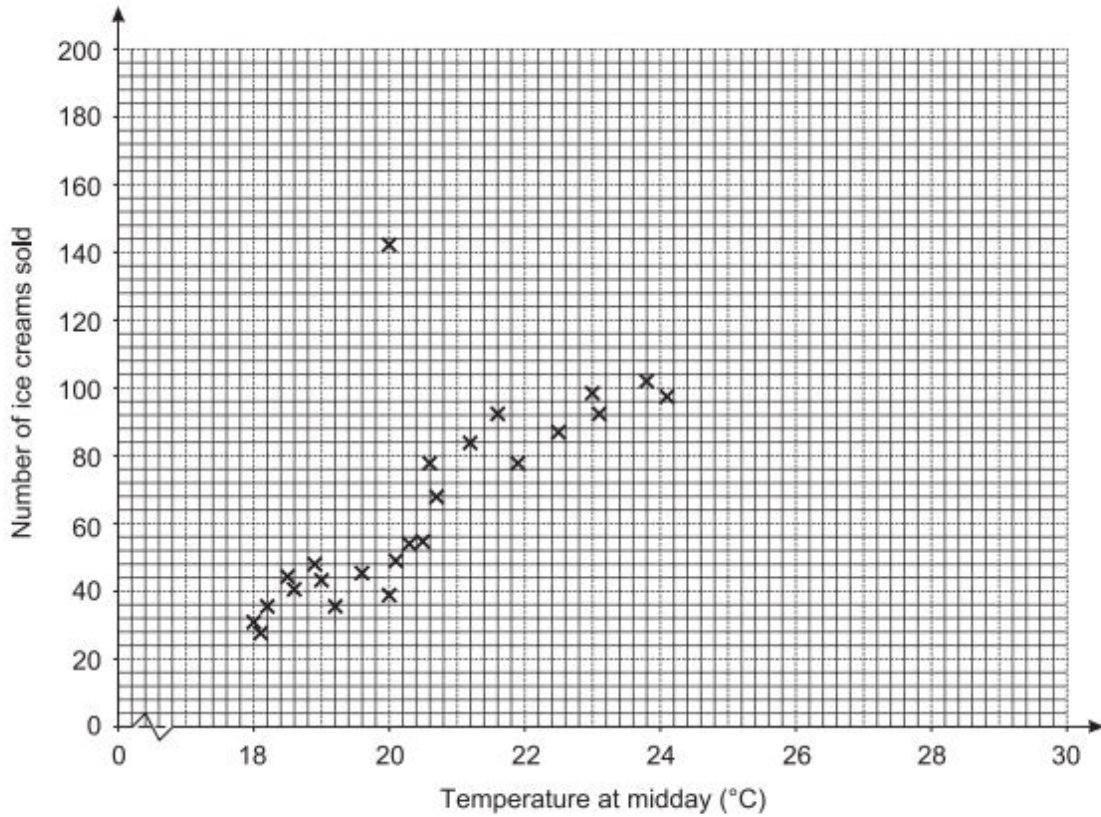
Give one reason why.

....

(1)

(Total for Question 21 is 4 marks)

12.

10 The graph shows the number of ice creams sold in a shop each day against the temperature at midday that day.

(a) **(i)** Describe the relationship between the temperature at midday and the number of ice creams sold.

.... **[1]**

(ii) One data point is an outlier.

Give a reason why this does not fit the rest of the data.

.... **[1]**

(b) Use the scatter graph to predict the number of ice creams sold on a day when the temperature at midday was

(i) 22°C

(b)(i) .... [1]

(ii) 28°C.

(ii) .... [1]

(iii) Explain which of these two predictions is more reliable.

....

....

.... [2]

(c) A newspaper headline reads

High temperatures make more people buy ice cream!

Does the graph above prove this claim?
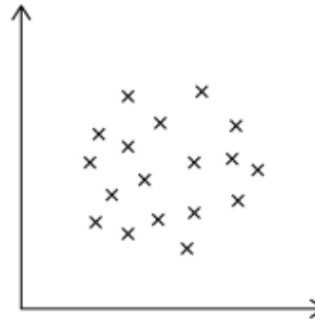Give a reason for your decision.

....

....

.... [2]

13.

20   A and B are scatter graphs.
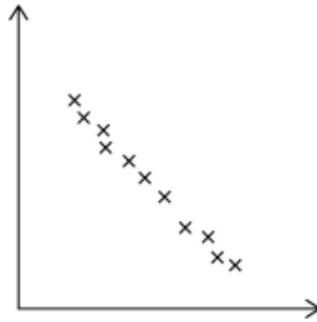
Graph A   **Graph B**

What type of correlation is shown by each graph?

Choose from

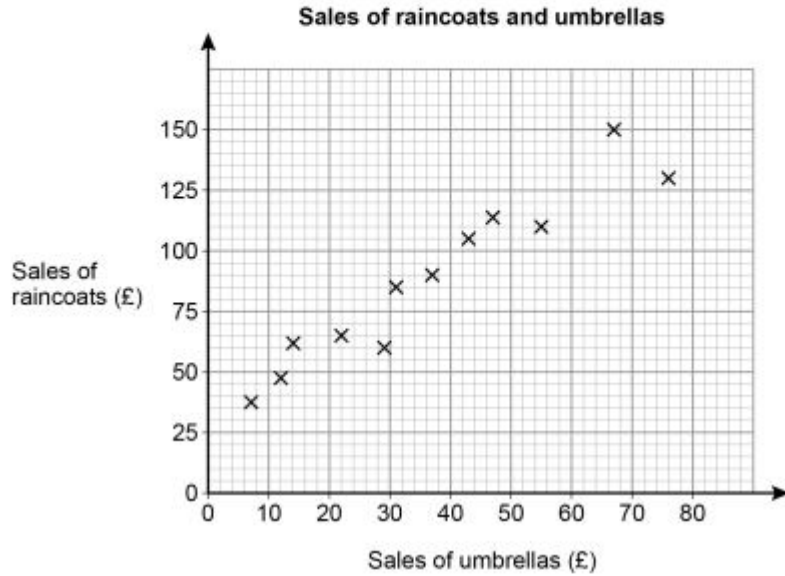| |
|---|
| Weak positive |
| Strong positive |
| Weak negative |
| Strong negative |
| No correlation |

[2 marks]

Graph A _____

Graph B _____

14.

18   A shop sells raincoats and umbrellas.

The scatter graph shows the monthly sales for 12 months.

Sales of raincoats and umbrellas

18 (a)   Write down the type of correlation shown by the graph.

[1 mark]

Answer _____

18 (b)   The manager expects the sales of umbrellas next month to be £60

Draw a line of best fit to estimate the sales of raincoats next month.
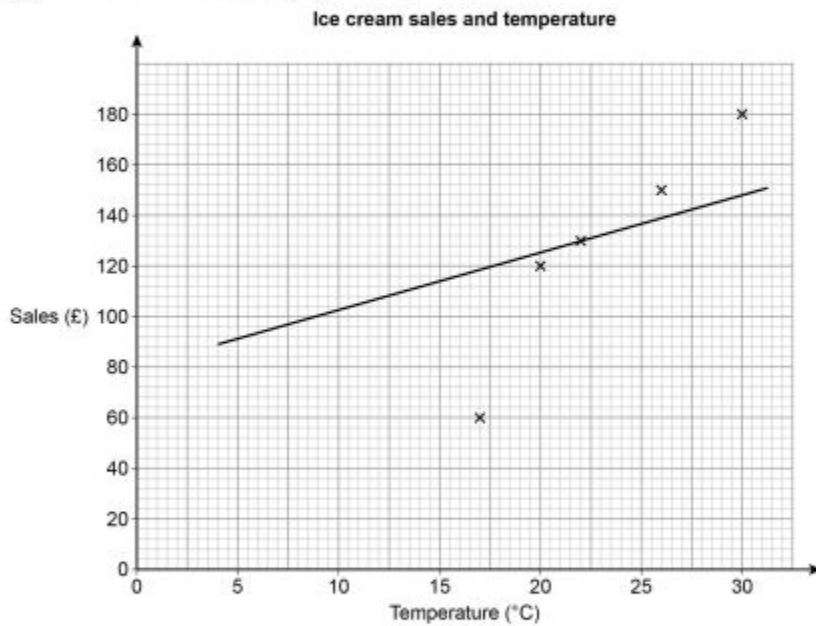
[3 marks]

Answer £_____

15.

12   Lee sells ice creams.

The table shows the midday temperature and his sales for five days.

	Day 1	Day 2	Day 3	Day 4	Day 5
Temperature (°C)	30	26	17	22	20
Sales (£)	180	150	80	130	120

12 (a)   He draws this scatter graph and line of best fit.

Ice cream sales and temperature

Write down **two** mistakes he has made.

[2 marks]

Mistake 1   _____

_____

Mistake 2   _____

_____

12 (b)   Lee wants to work out the range of the five temperatures.

His calculation is   30 – 20 = 10

Is his method correct?

Tick a box.

[1 mark]

Yes ☐   No ☐

Give a reason to support your answer.

_____

_____

12 (c)   The table shows Lee's costs.

Ingredients	15% of sales
Fuel	£7 per day

Work out his total profit for the five days.

[5 marks]

_____

_____

_____

_____

_____

_____

_____

_____

Answer £ _____