



CLASSIFIED

International Examinations Papers

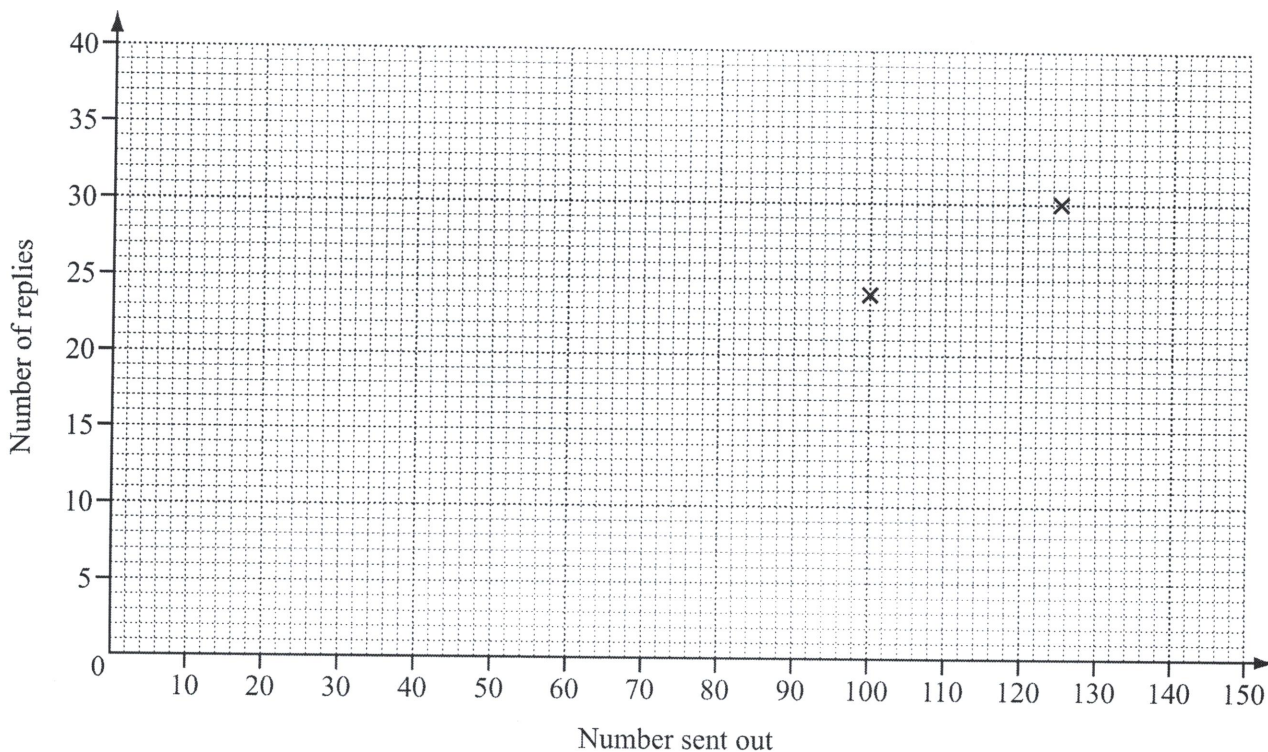
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MATHEMATICS - CORE

TOPIC- Statistics (Scatter diagram)

- 17 A company sends out ten different questionnaires to its customers.
The table shows the number sent and replies received for each questionnaire.

Questionnaire	A	B	C	D	E	F	G	H	I	J
Number sent out	100	125	150	140	70	105	100	90	120	130
Number of replies	24	30	35	34	15	25	22	21	30	31



- (a) Complete the scatter diagram for these results.
The first two points have been plotted for you. [2]

- (b) Describe the correlation between the two sets of data.

Answer(b) [1]

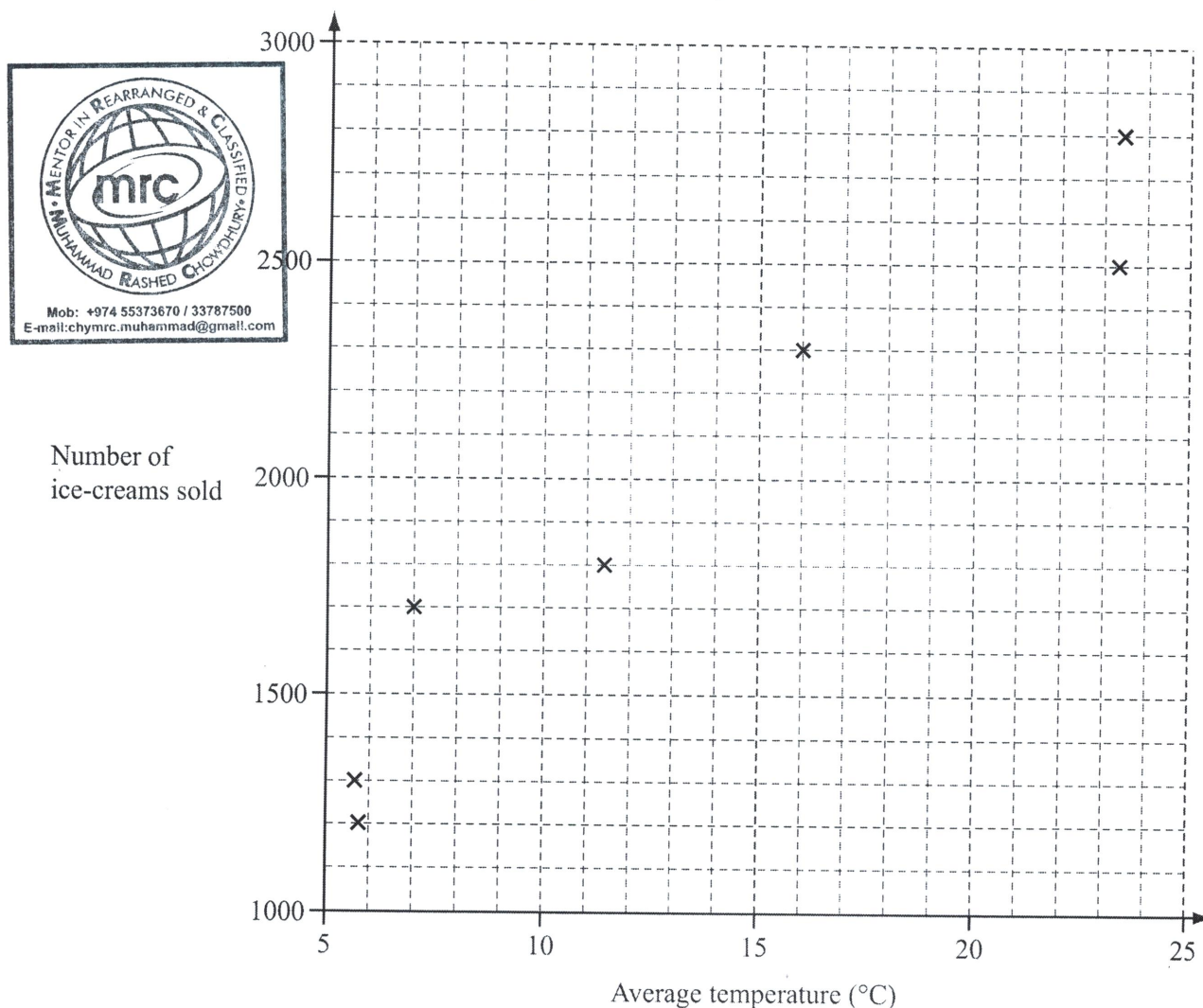
- (c) Draw the line of best fit. [1]



The table shows the average temperature and the number of ice-creams sold each month.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature (°C)	5.6	5.7	7.0	11.4	16.0	23.3	23.4	20.0	15.5	11.5	8.0	14.0
Number of ice-creams sold	1300	1200	1700	1800	2300	2500	2800	2600	1500	1600	1100	1900

- (i) Complete the scatter diagram for the months August to December. The points for January to July are plotted for you.



- (ii) What type of correlation does the scatter diagram show? [2]

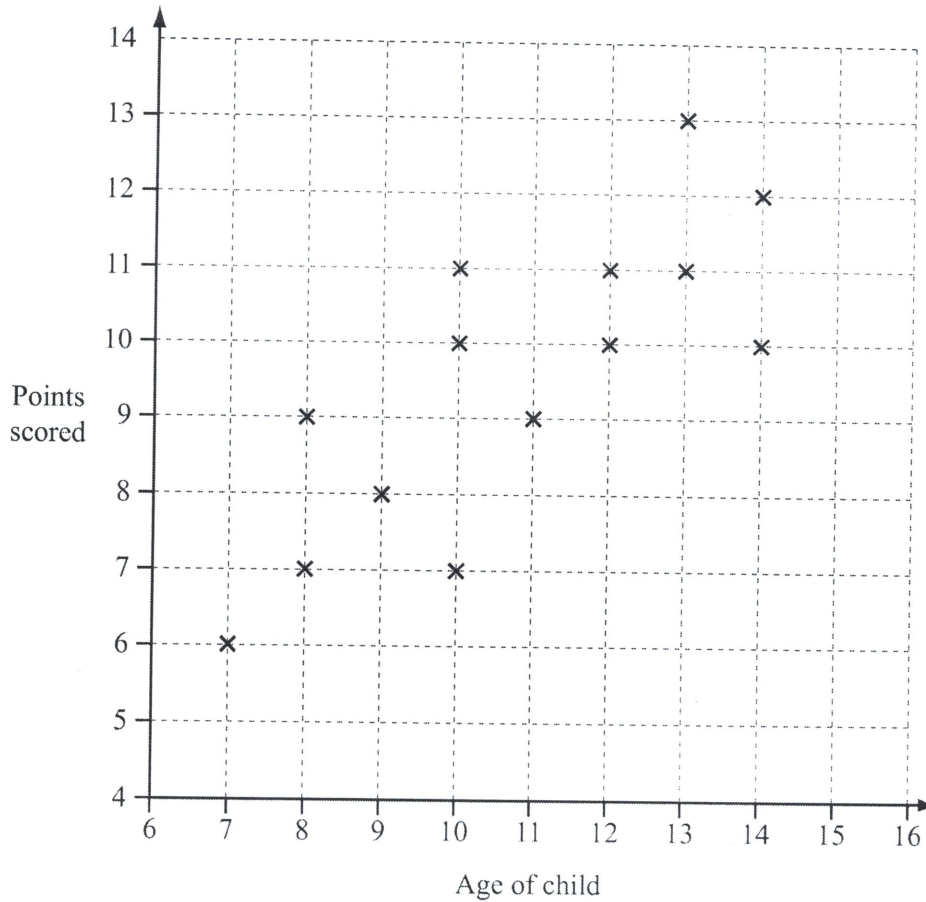
Answer(c)(ii) [1]

- (iii) Write down a statement connecting the number of ice-creams sold to the average monthly temperature.

Answer(c)(iii) [1]

14 children played a game.
The age of each child and the number of points they scored are plotted on the scatter diagram.

For
Examiner's
Use



(a) Write down the number of points the child aged 11 scored.

Answer(a) [1]

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

[1]

(c) What type of correlation is shown?

Answer(c) [1]

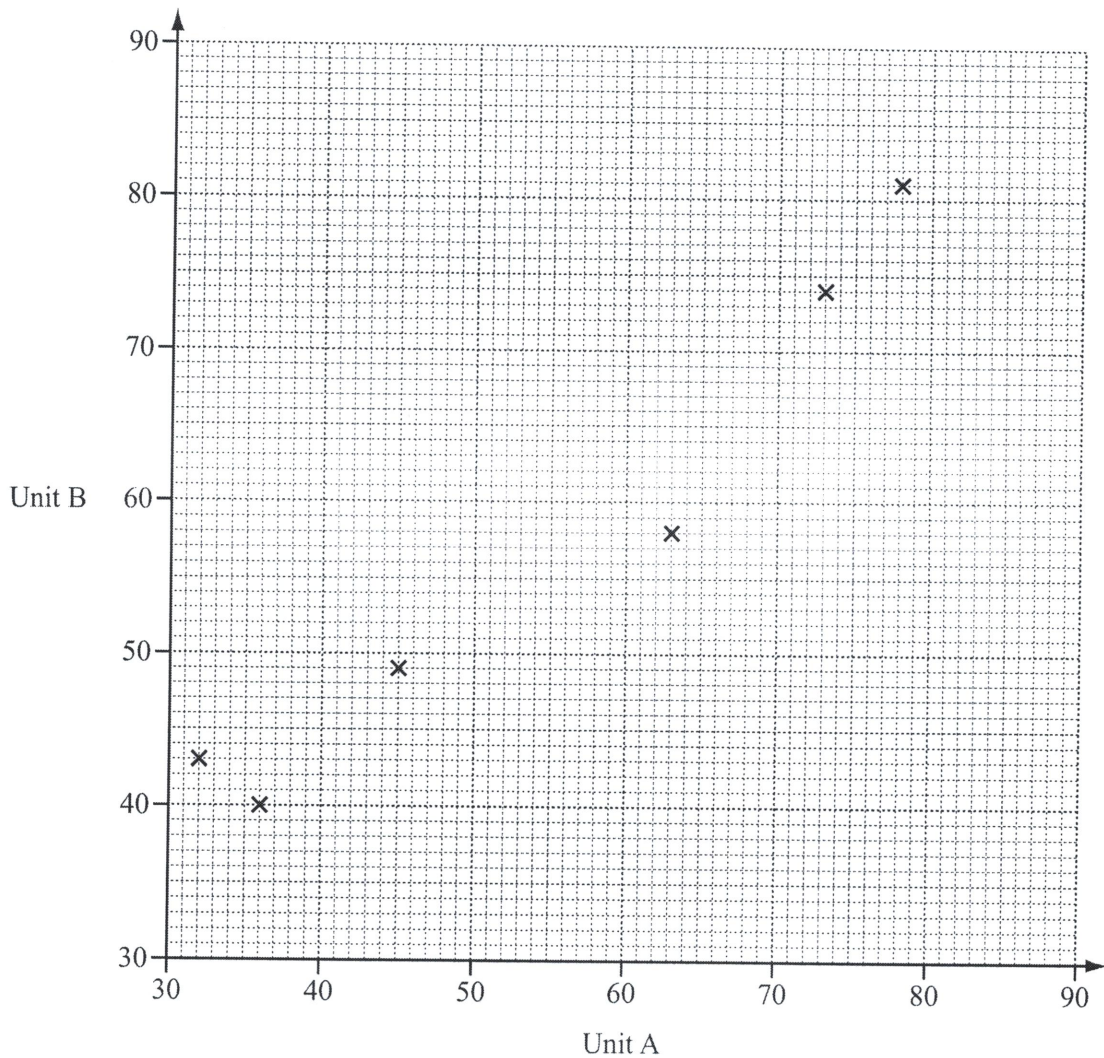


The table shows the marks for ten students in their Chemistry papers for Unit A and Unit B.

Unit A	32	78	45	63	36	73	58	41	68	54
Unit B	43	81	49	58	40	74	60	50	72	59

For
Examiner's
Use

- (a) On the grid, complete the scatter diagram for these results.
The first six points have been plotted for you.



[2]

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

Answer(b)

[1]



(c) (i) Calculate the mean of the marks for Unit A.

Answer(c)(i) [2]

(ii) Work out the range of the marks for Unit A.

Answer(c)(ii) [1]

(iii) The mean for Unit B is 58.6.

Which unit did the students find more difficult?
Give a reason for your answer.

Answer(c)(iii) Unit because
..... [1]

(d) (i) Draw a line of best fit on the grid. [1]

(ii) Lee scored 48 on Unit A but she was absent for Unit B.

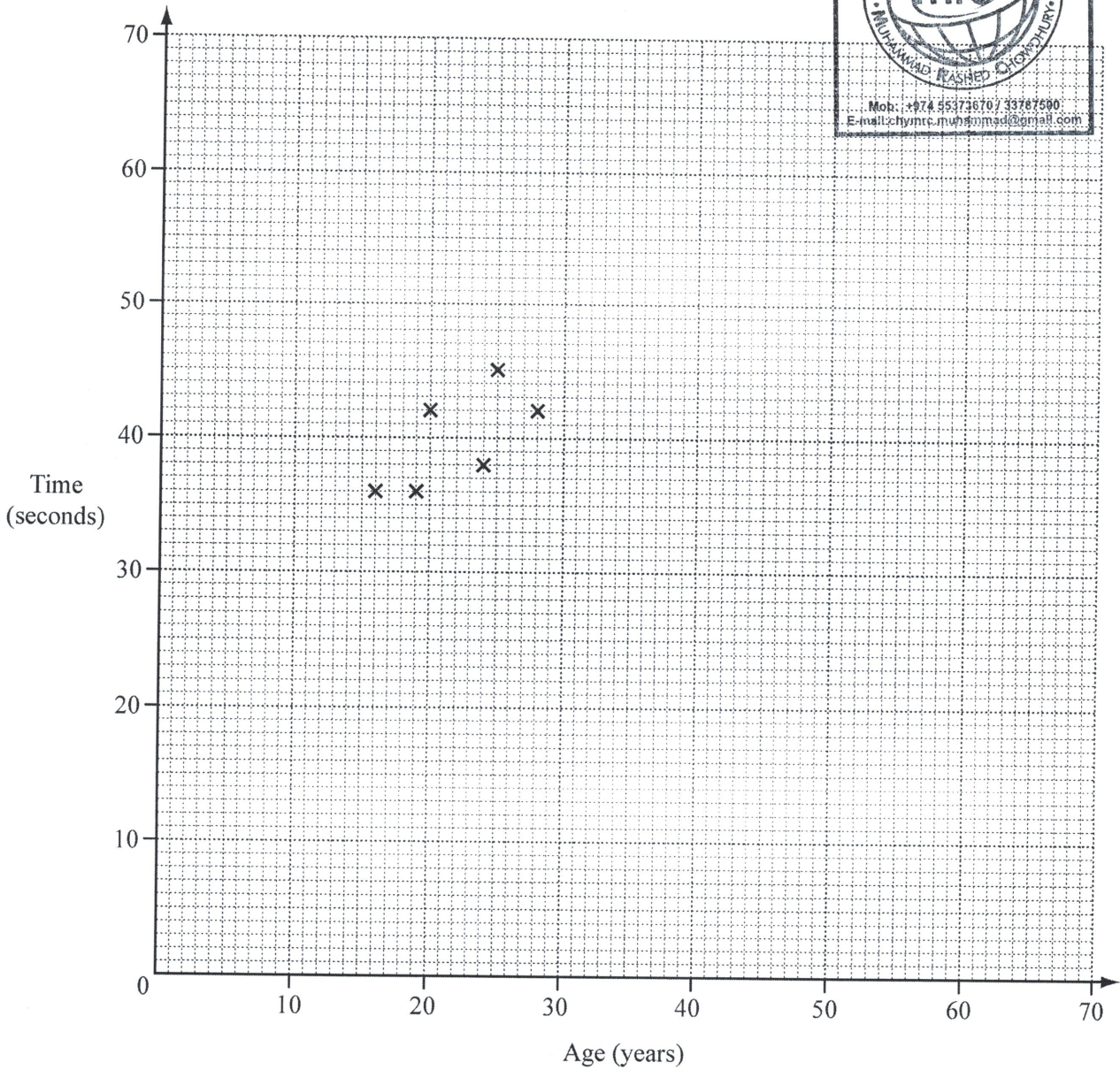
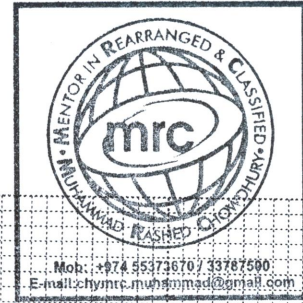
Use your line of best fit to estimate her score on Unit B.

Answer(d)(ii) [1]

(e) Find how many students scored more than 65 marks on both units.

Answer(e) [1]

- (i) Complete the scatter diagram.
The first six points have been plotted for you.



[2]

- (ii) What type of correlation does the scatter diagram show?

Answer(d)(ii) [1]

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

- (iv) Would it be sensible to use your line of best fit to estimate the time taken by a child aged 8 to solve the puzzle?
Explain your answer.

Answer(d)(iv) because

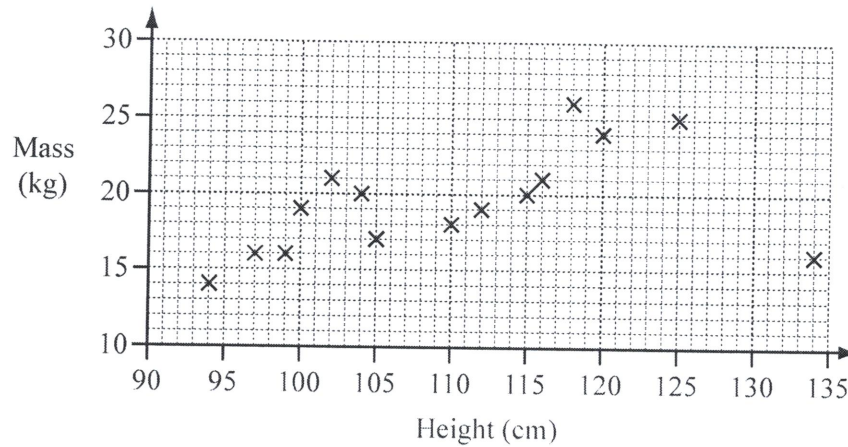
..... [1]

Solve the equation.

$$\frac{2x + 5}{3} = 8$$

Answer $x =$ [3]

06 The scatter diagram shows the heights and masses of some five-year-old boys.



(a) The height of one of the boys is likely to have been recorded incorrectly.

Write down the mass of this boy.

Answer(a) kg [1]

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

Answer(b) [1]

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

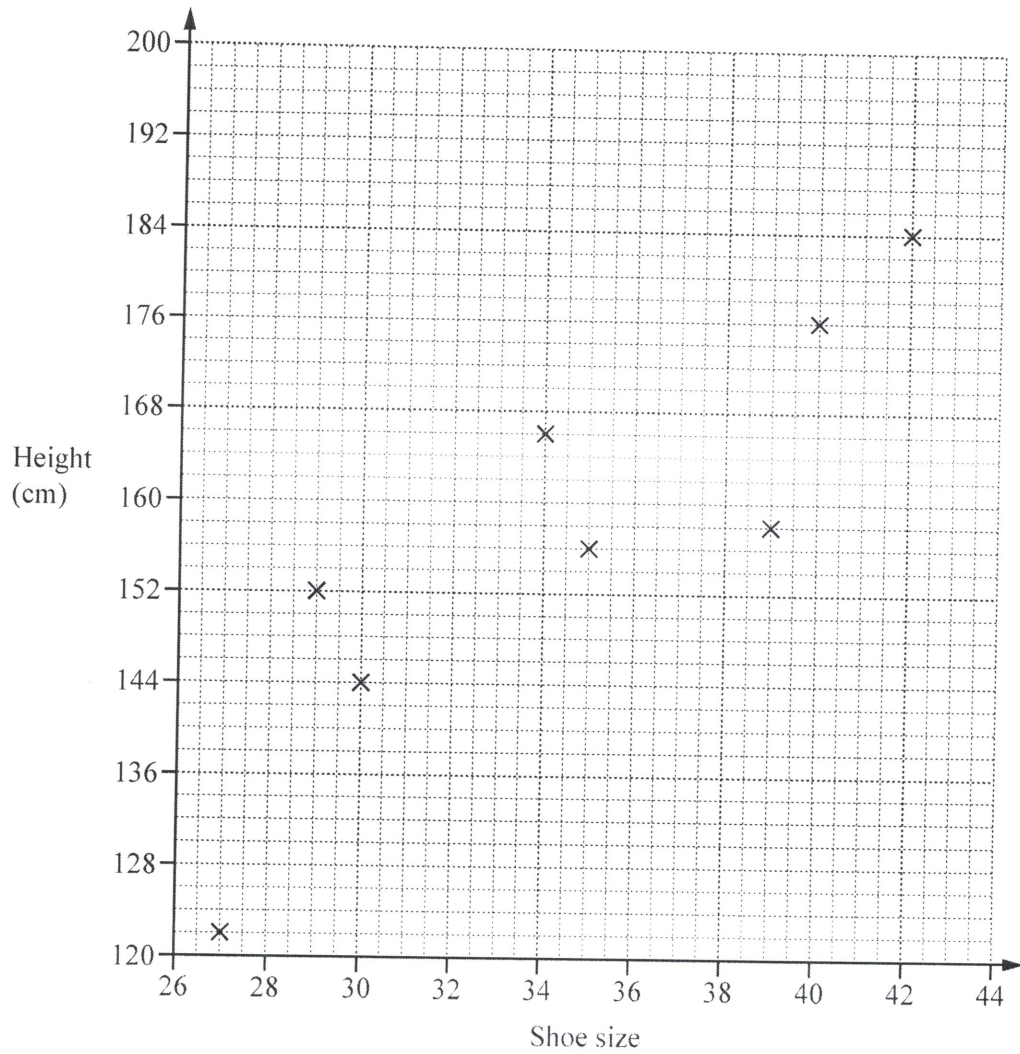
[1]

(ii) Another boy had a height of 108 cm.
His mass was not recorded.

Use your line of best fit to estimate the boy's mass.

Answer(c)(ii) kg [1]

17 The scatter diagram shows the results of height plotted against shoe size for 8 people.



(a) Four more results are recorded.

Shoe size	28	31	38	43
Height (cm)	132	156	168	198

Plot these 4 results on the scatter diagram.

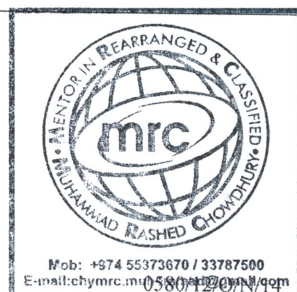
[2]

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

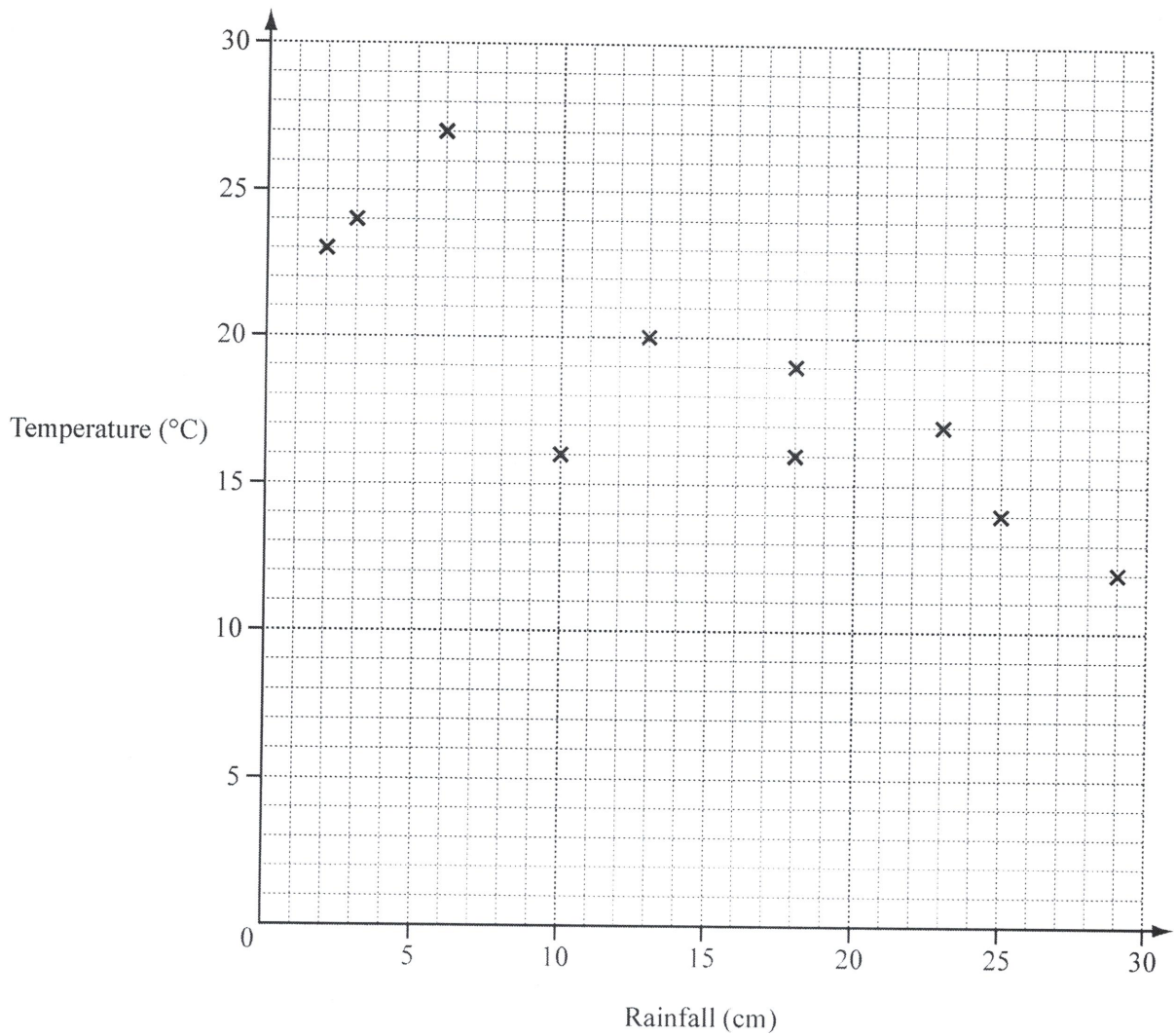
[1]

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

Answer(c) [1]



08 The scatter diagram shows the rainfall and the average temperature in a city for the month of June, over a period of 10 years.



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

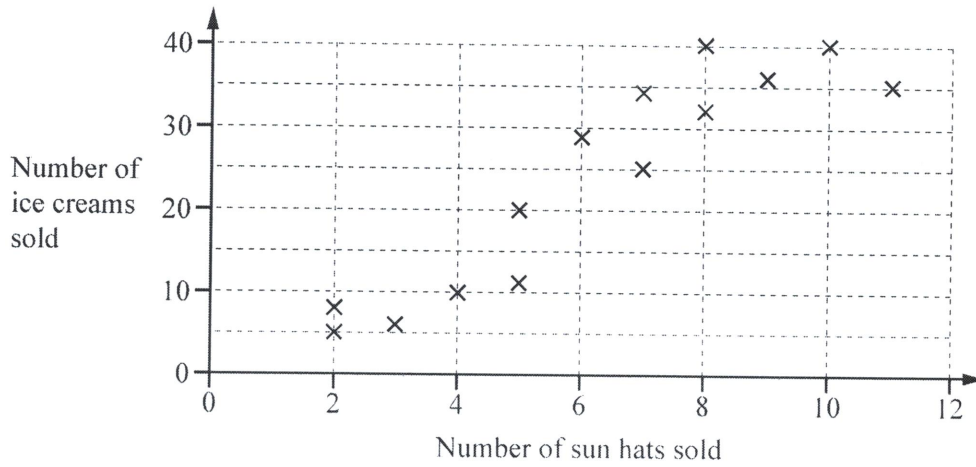
Answer(a) [1]

(b) Describe the relationship between the rainfall and the average temperature.

Answer(b)
 [1]



9 The scatter diagram shows the number of sun hats and ice creams sold by a shop each day for two weeks.



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

Answer(a) [1]

(b) Describe the relationship between the number of sun hats sold and the number of ice creams sold.

Answer(b)
 [1]

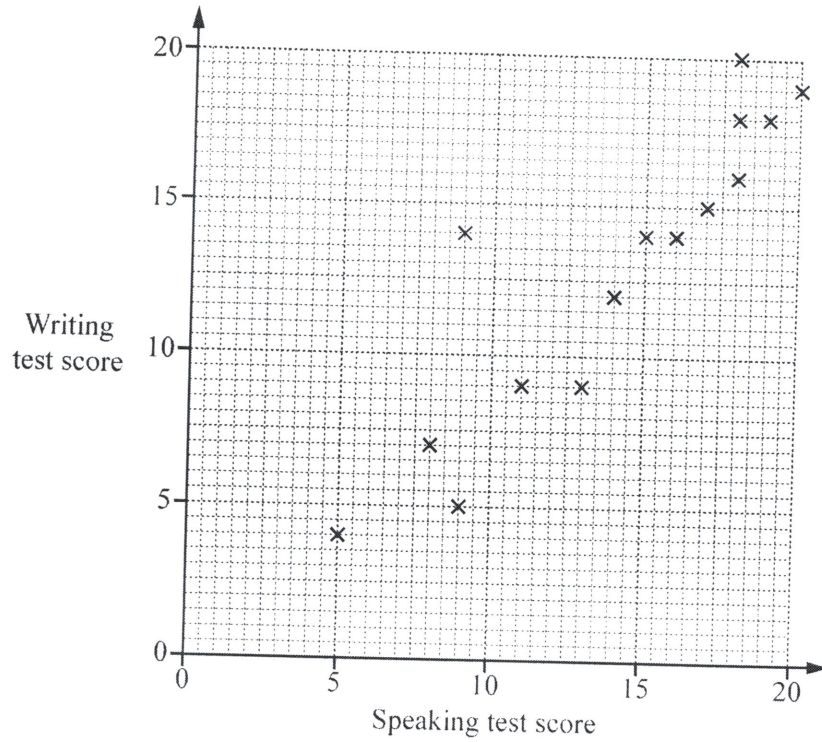
10 Simplify.

$$6uw^{-3} \times 4uw^6$$

Answer [2]



The scatter diagram shows the speaking test scores and the writing test scores for 15 students.



(a) One student's writing test score was much better than their speaking test score.

Draw a ring around this point on the scatter diagram.

[1]

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

..... [1]

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

[1]

(d) One student's scores were not recorded on the scatter diagram. His writing test score was 10.

Use your line of best fit to estimate his speaking test score.

..... [1]



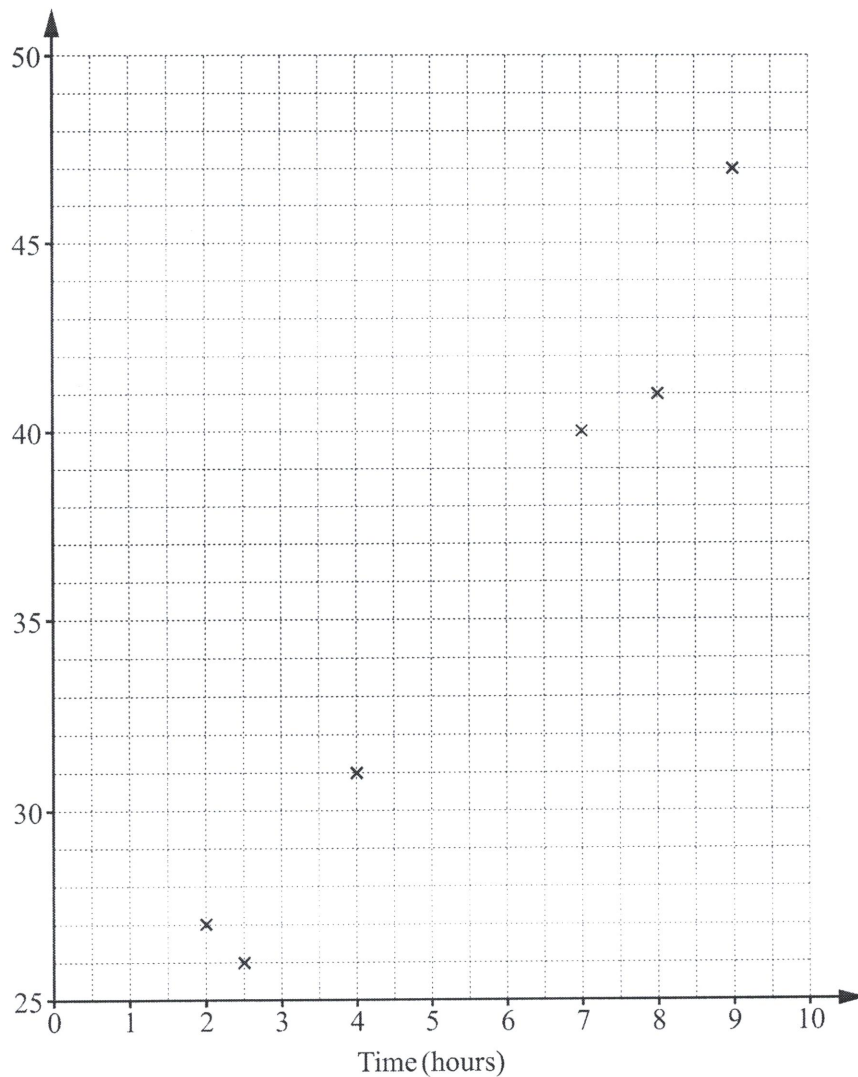
12

Six students revise for a test.

The scatter diagram shows the time, in hours, each student spent revising and their mark in the test.



Mark



(a) The data for two more students is shown in the table.

Time (hours)	4.5	6.5
Mark	33	35

Plot these two points on the scatter diagram.

[1]

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

..... [1]

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

[1]

(d) Another student spent 5.5 hours revising.

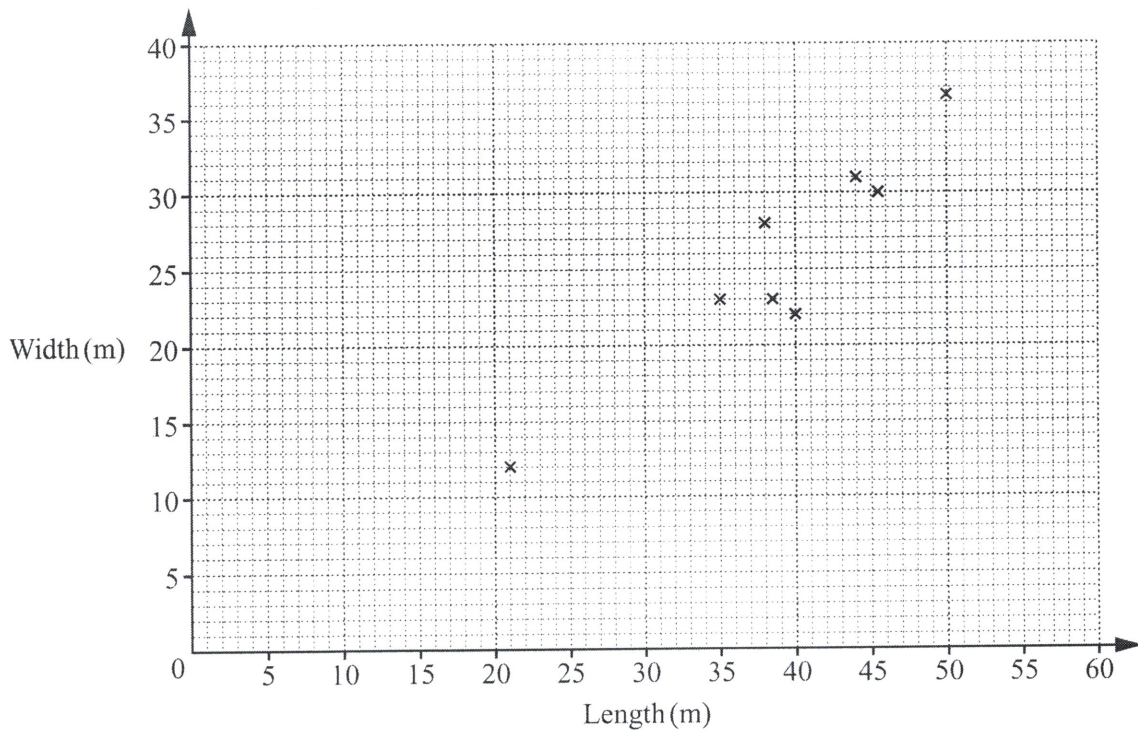
Estimate a mark for this student.

..... [1]

Ten students estimate the length and width of their rectangular school hall. The results are shown in the table.

Student	A	B	C	D	E	F	G	H	I	J
Length (m)	35	50	38	45.5	21	38.5	40	44	45	26
Width (m)	23	36.5	28	30	12	23	22	31	35	18

The first 8 results have been plotted on the scatter diagram.



- (a) On the scatter diagram, plot the results for students I and J. [1]

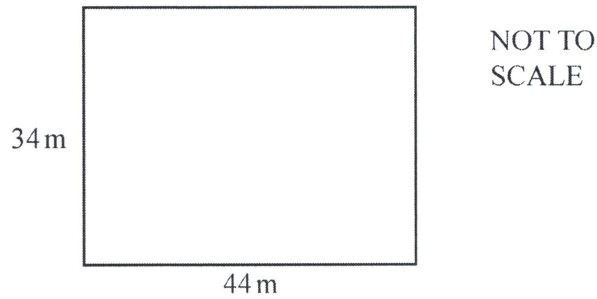
- (b) What type of correlation is shown by this scatter diagram? [1]

- (c) (i) On the scatter diagram, draw a line of best fit. [1]

- (ii) Another student, Pedro, estimates the length of the hall as 31 m. His result for the width is missing.

- Use your line of best fit to estimate his result for the width. m [1]

(d) The actual measurements of the hall are length 44 m and width 34 m.



(i) The teacher says a 'good estimator' has both estimates no more than 5 m from the actual measurements.

Write down the letters of the students who are 'good estimators'.

..... [2]

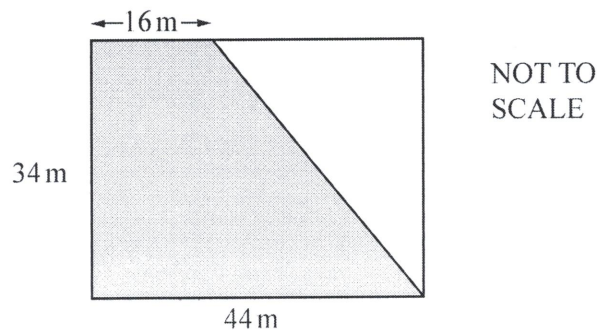
(ii) Work out the perimeter of the hall.

..... m [1]

(iii) Calculate the length of a diagonal of the hall.

..... m [2]

(e) The hall is divided into two areas.



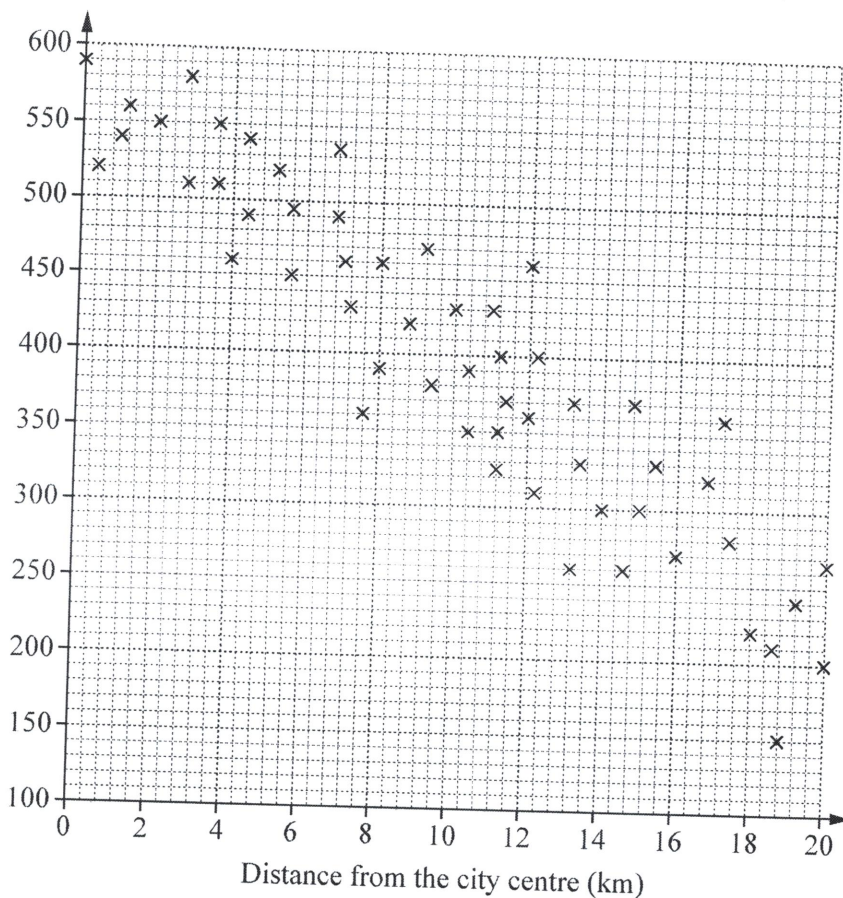
Find the shaded area.

..... m² [2]

The scatter diagram shows the prices of houses for sale and their distances from the city centre.



Price of house
(thousands of dollars)



(a) What type of correlation is shown in this scatter diagram?

..... [1]

(b) Brad wants to live as close to the city centre as possible.
He has a maximum of \$500 000 to spend on one of these houses.

How close to the city centre can he live?

..... km [1]

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

[1]

(ii) Estimate the price of a house that is 14 km from the city centre.

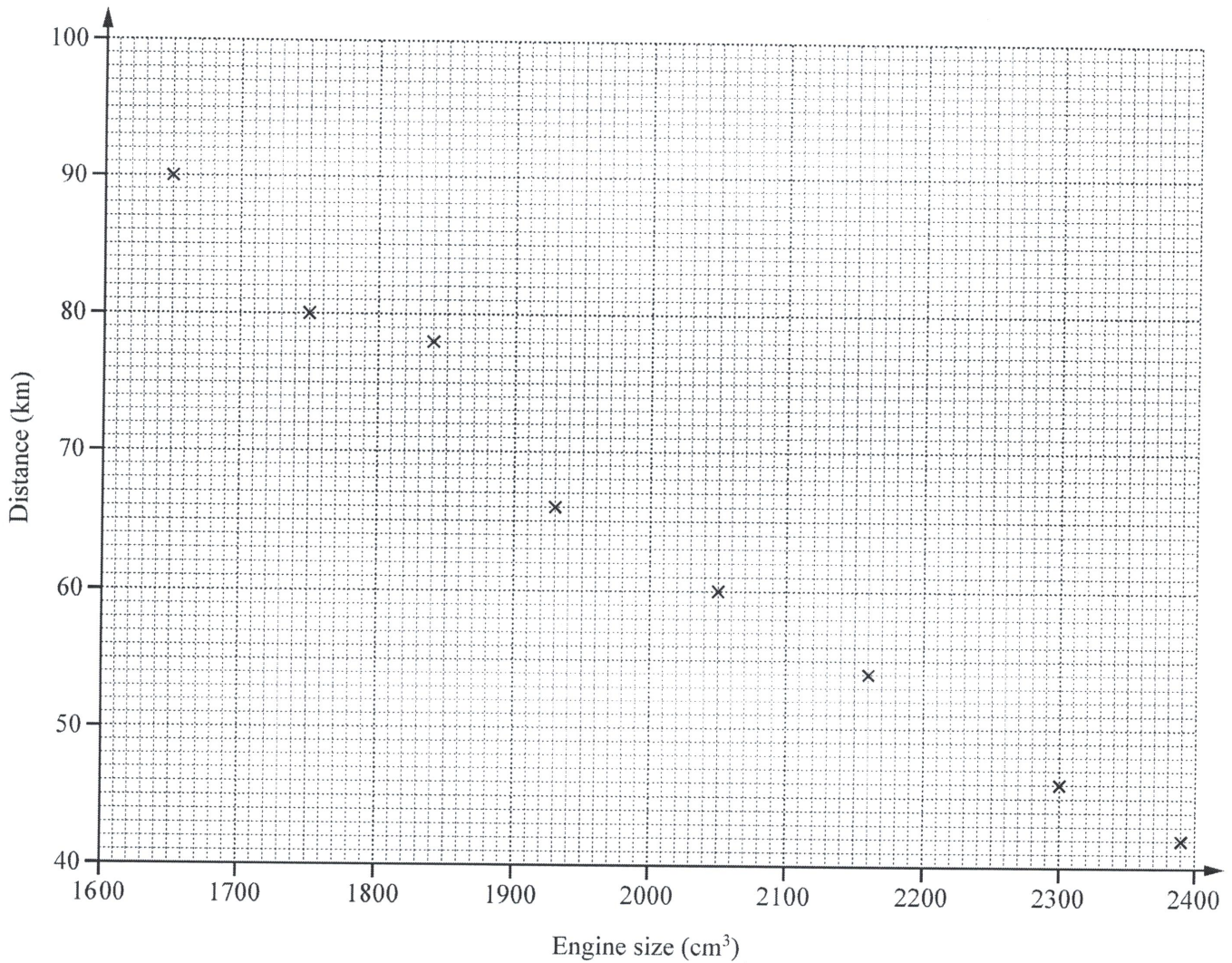
\$..... [1]

15

Bataar is comparing the engine size of a car with the distance it travels on one gallon of fuel. The results for 12 cars are recorded in the table.

Engine size (cm ³)	1750	2160	1840	2390	1650	2300	1930	2050	1700	2000	2200	1900
Distance (km)	80	54	78	42	90	46	66	60	84	58	73	75

- (a) (i) Complete the scatter diagram.
The first 8 points have been plotted for you.



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

- (iii) What type of correlation is shown on the scatter diagram?

Answer(a)(iii) [1]

(b) Bataar has recorded an incorrect distance in his table.

(i) Write down the distance that is most likely to be incorrect.

Answer(b)(i) km [1]

(ii) Use your scatter diagram to estimate the correct distance for this car.

Answer(b)(ii) km [1]

12 athletes took part in the 100 metres race.

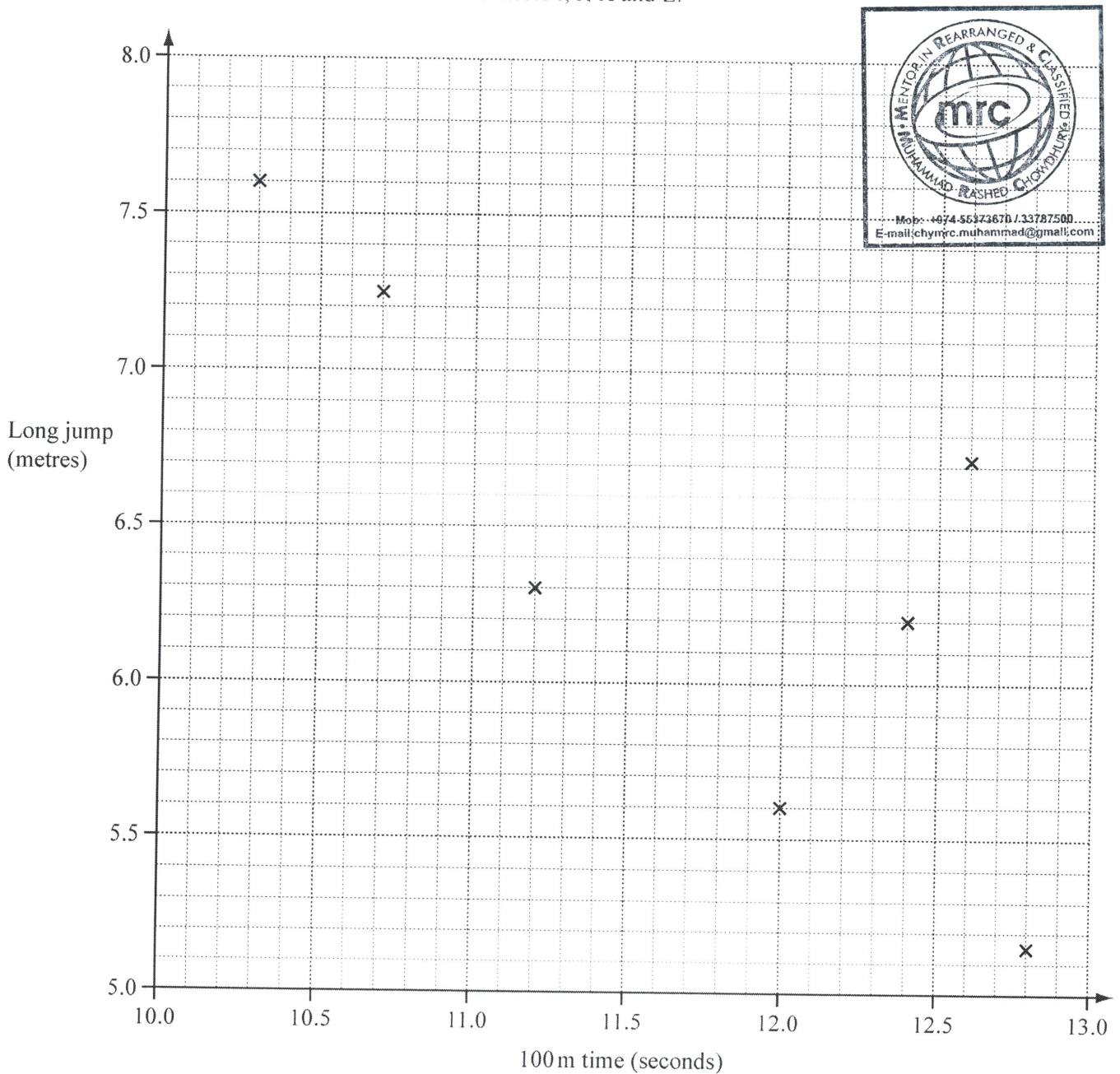
11 of these athletes also took part in the long jump.

The times and distances, each measured correct to 3 significant figures, for these athletes are shown in the table.

Athlete	A	B	C	D	E	F	G	H	I	J	K	L
100m time (seconds)	12.1	10.3	12.8	10.7	12.6	11.2	12.0	12.4	10.6	12.7	11.8	11.1
Long jump (metres)	×	7.60	5.15	7.25	6.72	6.30	5.60	6.20	6.90	5.70	6.85	6.70

(a) The scatter diagram shows the times and distances for athletes B to H.

(i) Plot the times and distances for athletes I, J, K and L.



[2]

(ii) On the scatter diagram, draw a line of best fit. [1]

(iii) Athlete A did not take part in the long jump.

Use your line of best fit to estimate a long jump distance for athlete A.

Answer(a)(iii) m [1]

(iv) What type of correlation is shown on the scatter diagram?

Answer(a)(iv) [1]

(v) Describe in words the relationship between the time for 100 metres and the distance in the long jump.

Answer(a)(v)
..... [1]

(b) Use the table of times and distances to work out

(i) the mean of the 100 metres times,

Answer(b)(i) s [2]

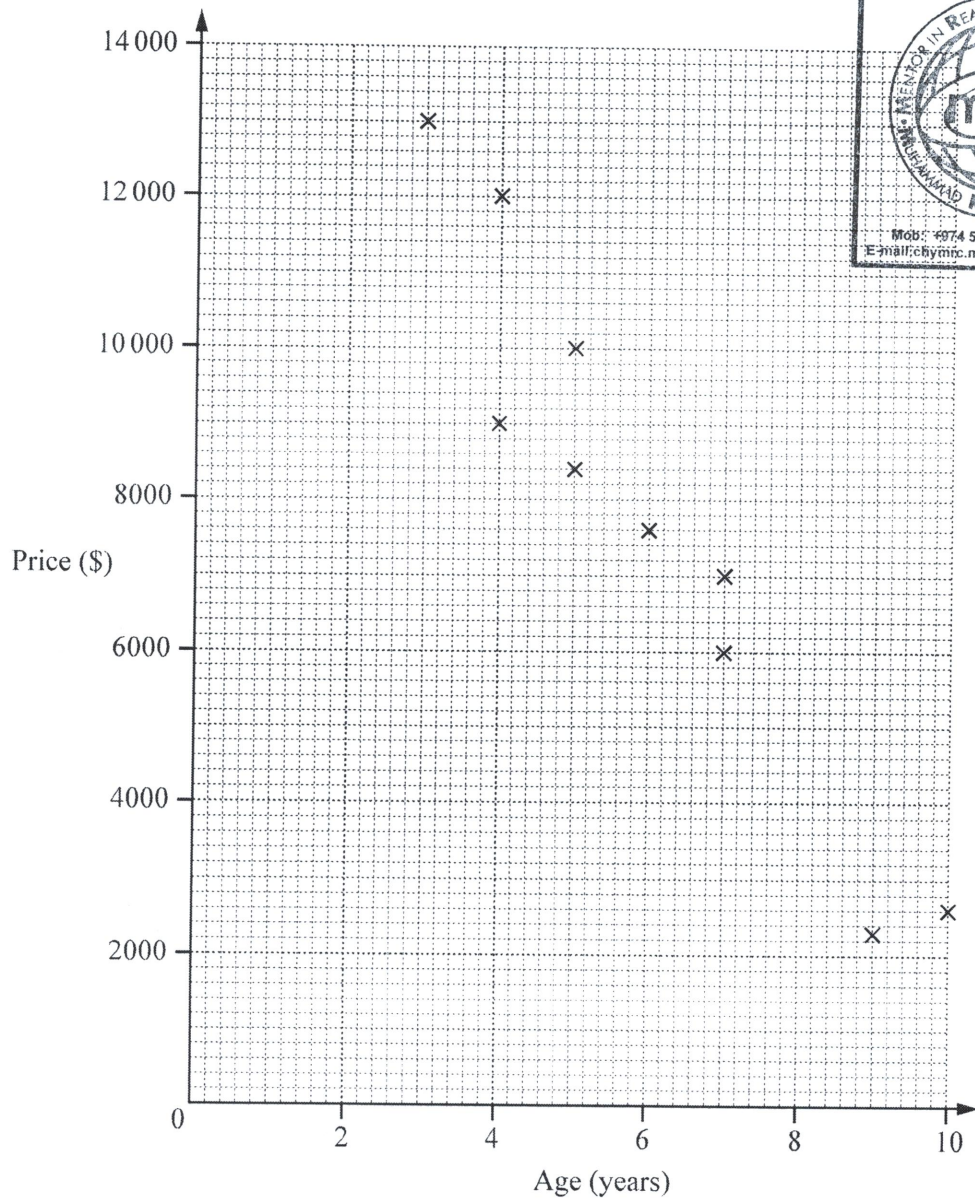
(ii) the percentage of athletes who ran 100 metres in less than 11.5 seconds,

Answer(b)(ii) % [2]

(iii) the range of the distances jumped by the 11 athletes, B to L.

Answer(b)(iii) m [1]

- 17 Amir looks at adverts for the same model of car.
The scatter diagram shows the age and price of each car.



- (a) What type of correlation is shown on the scatter diagram?

Answer(a) [1]

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

[1]

- (c) Use your line of best fit to estimate the price of a car that is 8 years old.

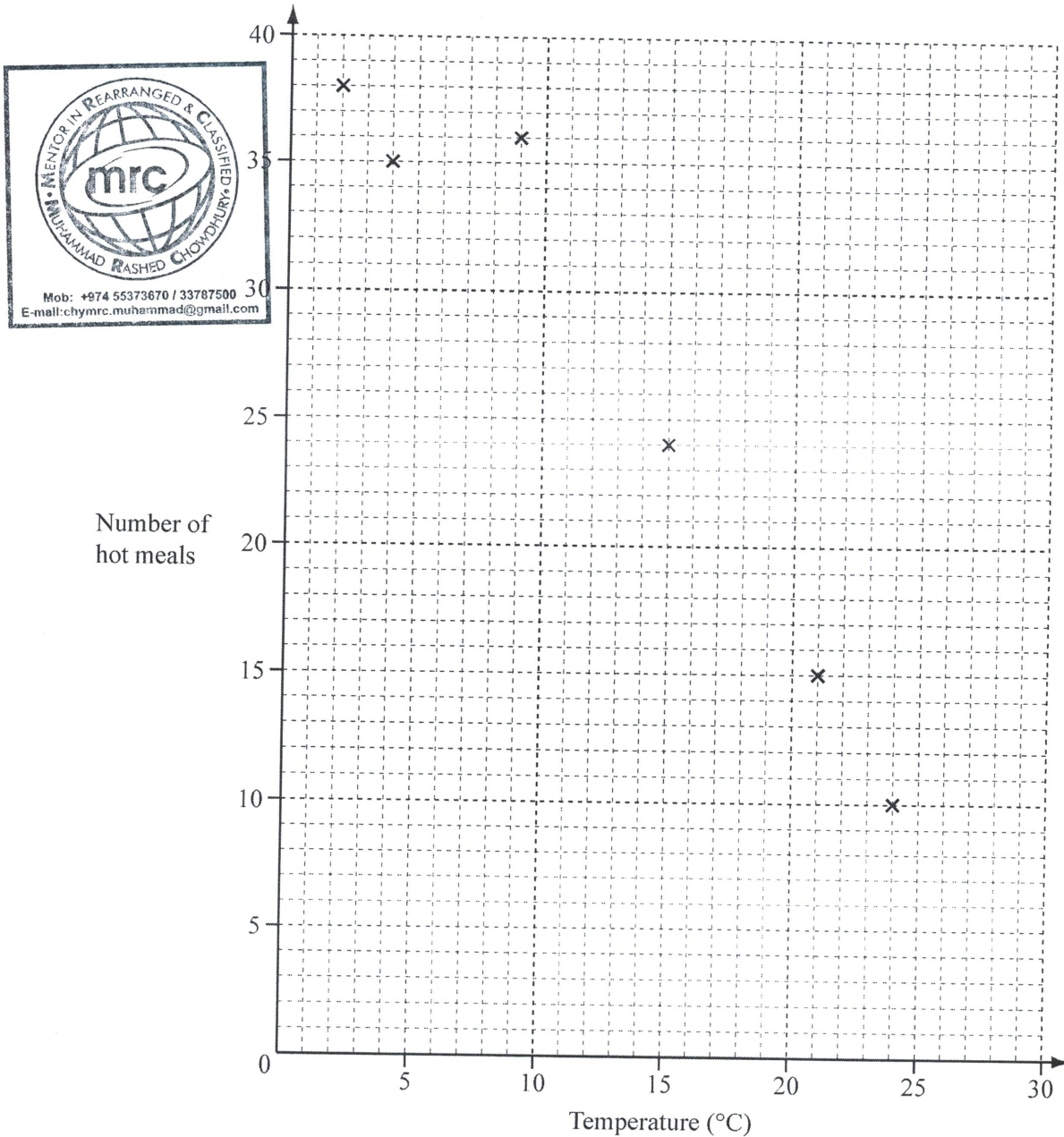
Answer(c) \$ [1]

- 18 On the first day of each month, a café owner records the midday temperature ($^{\circ}\text{C}$) and the number of hot meals sold.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Temperature ($^{\circ}\text{C}$)	2	4	9	15	21	24	28	27	23	18	10	5
Number of hot meals	38	35	36	24	15	10	4	5	12	20	18	32

- (a) Complete the scatter diagram.

The results for January to June have been plotted for you.



- (b) On the grid, draw the line of best fit.

- (c) What type of correlation does this scatter diagram show?

Answer(c) [1]

- (a) The table shows the results of a survey in a village. It shows the number of males and females who are left-handed, right-handed or ambidextrous.

	Left-handed	Right-handed	Ambidextrous	Total
Male	17		5	84
Female	21	102	3	126
Total	38	164	8	210

(i) Complete the table by finding the number of males in the survey who are right-handed. [1]

(ii) Using these results, write down the probability that

(a) a male chosen at random is left-handed,

..... [1]

(b) a left-handed person chosen at random is female,

..... [1]

(c) a person chosen at random is right-handed.

..... [1]

(iii) Here are the ages of the people who are ambidextrous.

27 79 31 16 60 45 42 52

Find the median age of these people.

..... [2]

- (b) This table shows the results of another survey. It shows the number of people in each of 50 households.

Number of people	Frequency
1	5
2	8
3	12
4	14
5	7
6	4

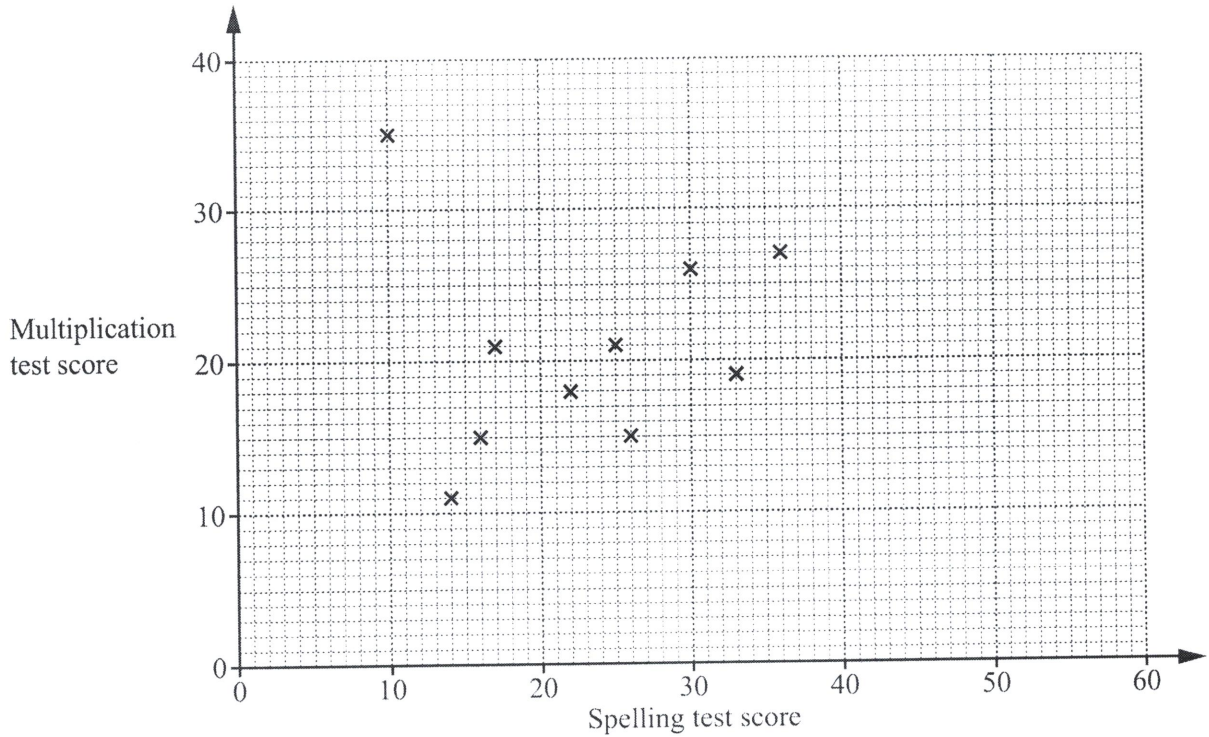


Work out the mean number of people in each household.

..... [3]

- (c) Some students in the village school were given a multiplication test and a spelling test. The scores are shown in the table.

Spelling test score	14	16	33	22	26	17	36	25	10	30	55	38	42	48
Multiplication test score	11	15	19	18	15	21	27	21	35	26	34	23	28	31



- (i) Complete the scatter diagram.
The first ten points have been plotted for you. [2]
- (ii) One student has a high score in the multiplication test and a low score in the spelling test.
On the scatter diagram, put a ring around this point. [1]
- (iii) What type of correlation is shown in this scatter diagram?
..... [1]
- (iv) On the scatter diagram, draw a line of best fit. [1]
- (v) Another student, Kim, scored 45 in the spelling test but was absent for the multiplication test.
Use your line of best fit to estimate a score for Kim in the multiplication test.
..... [1]

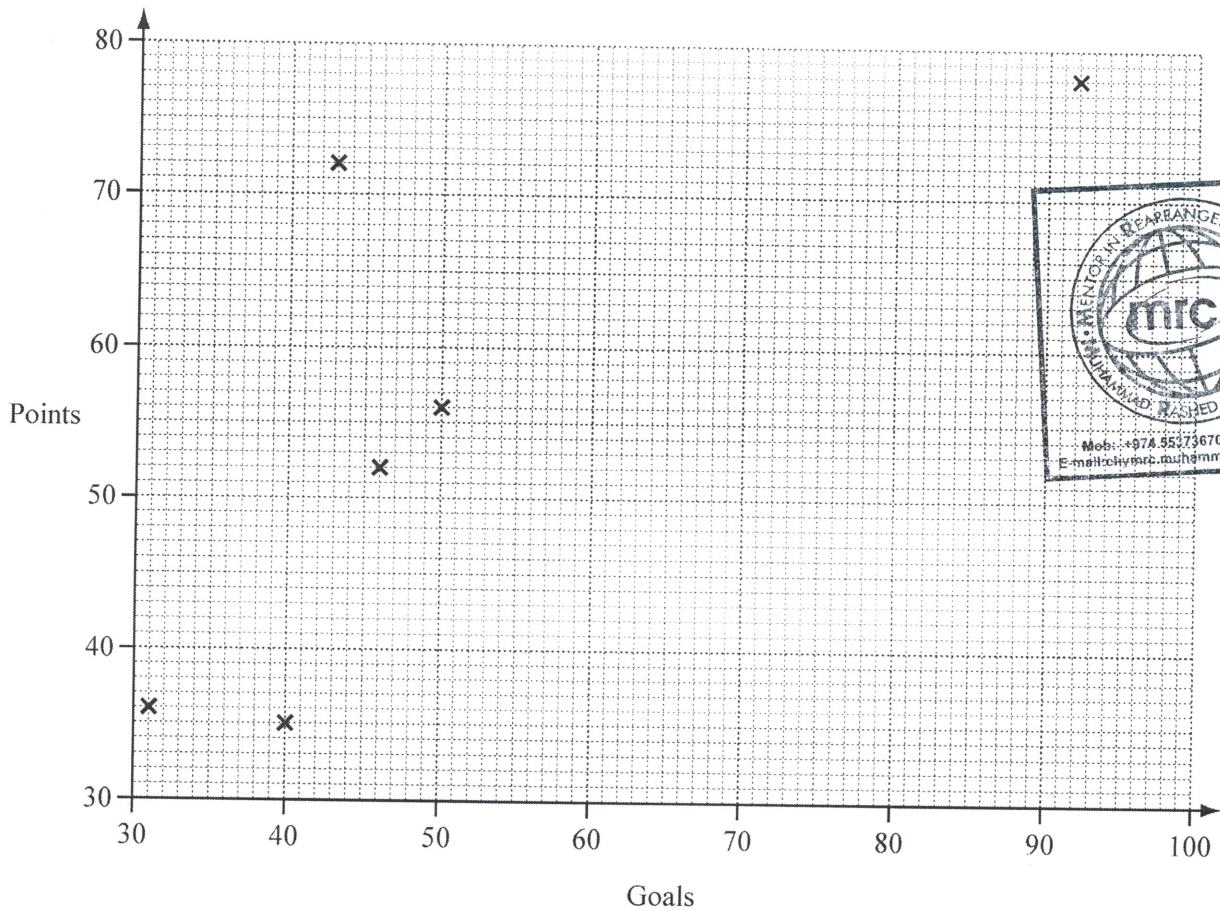
20

The table shows the total goals scored and the total points gained by 10 teams.

Team	A	B	C	D	E	F	G	H	I	J
Goals	31	40	46	50	43	92	60	84	68	87
Points	36	35	52	56	72	78	59	70	61	75

- (i) Complete the scatter diagram.
The first six points have been plotted for you.

[2]



- (ii) Draw the line of best fit.
(iii) What type of correlation is shown?

[1]

Answer(c)(iii) [1]

- (iv) Use your line of best fit to estimate the total points gained by a team scoring 75 goals.

Answer(c)(iv) [1]

- (v) Which team only scores a few goals but gains a lot of points?

Answer(c)(v) [1]



21

Ten boys go swimming.
The teacher records, in seconds, the time each boy takes to

- get ready for swimming
- swim one length.

These times are shown in the table below.

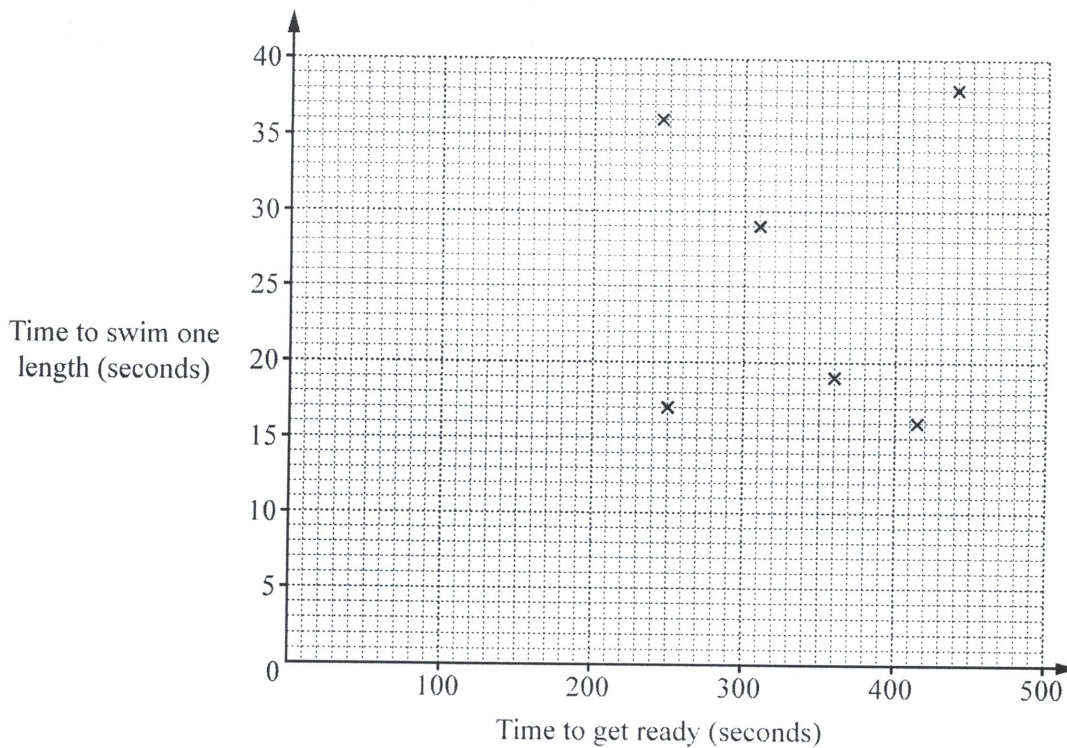
Boy	A	B	C	D	E	F	G	H	I	J
Time to get ready	310	250	360	245	440	415	290	420	480	400
Time to swim one length	29	17	19	36	38	16	40	32	20	30

(i) A boy is chosen at random.

Find the probability that he takes more than 300 seconds to get ready.

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

(ii) Complete the scatter diagram.
The first six points have been plotted for you.



(iii) Another boy takes 340 seconds to get ready.

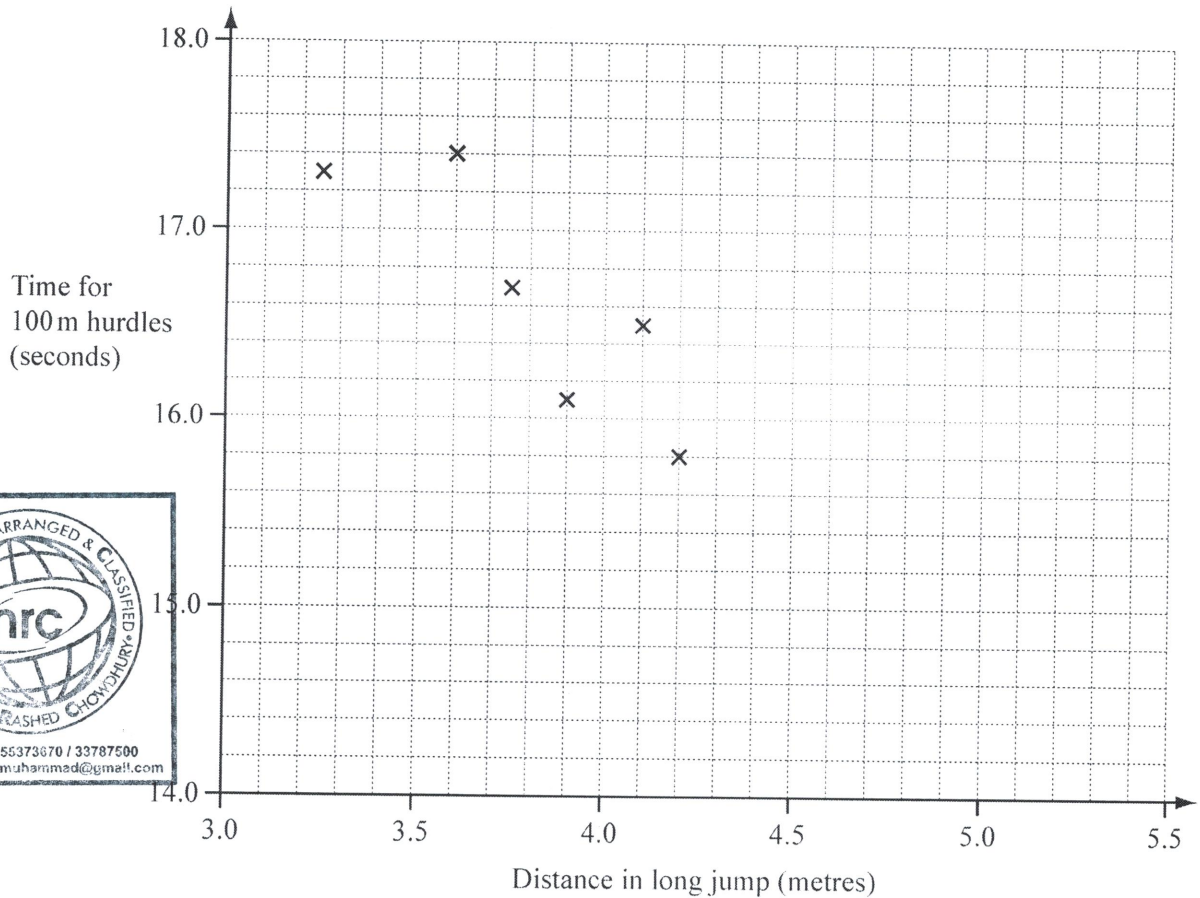
[2]

Can the scatter diagram be used to estimate the time it will take him to swim one length?
Give a reason for your answer.

Answer(b)(iii)..... because

..... [1]

(i) Complete the scatter diagram.
The first six points have been plotted for you.



[2]

(ii) What type of correlation does this scatter diagram show?

Answer(b)(ii) [1]

(iii) Describe the relationship between the distance in the long jump and the time for the 100m hurdles.

Answer(b)(iii) [1]

(iv) On the grid, draw the line of best fit. [1]

(v) Another student jumps 3.50 m in the long jump.

Use your line of best fit to estimate the time for this student in the 100 m hurdles.

Answer(b)(v) s [1]

(vi) A different student jumps 5.20 m in the long jump.

Explain why you should not use your scatter diagram to estimate their time in the 100m hurdles.

Answer(b)(vi) [1]

- 1 Write in figures the number nine million eighty two thousand five hundred and seven.

..... [1]

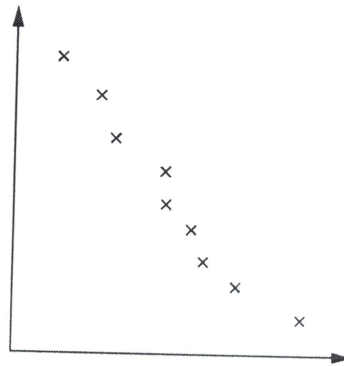
- 2 Write 71 496 correct to 2 significant figures.

..... [1]

- 3 Find the cube root of 4913.

..... [1]

4



What type of correlation is shown by the scatter diagram?

..... [1]

- 5 Calculate.

$$\frac{17.85 - 7.96}{18 - 3.5^2}$$

..... [1]

- 1 A doctor starts work at 20 40 and finishes work at 06 10 the next day.

How long is the doctor at work?

Give your answer in hours and minutes.

Answer h min [1]

- 2 Write 53 400 000 in standard form.

Answer [1]

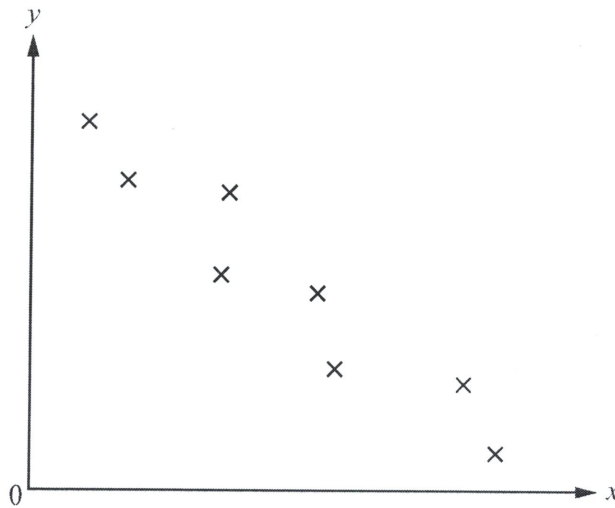
- 3 Write down the gradient of the line $y = -3x + 4$.

Answer [1]

- 4 Simplify $5x^0$.

Answer [1]

5



What type of correlation is shown on the scatter diagram?

Answer [1]
