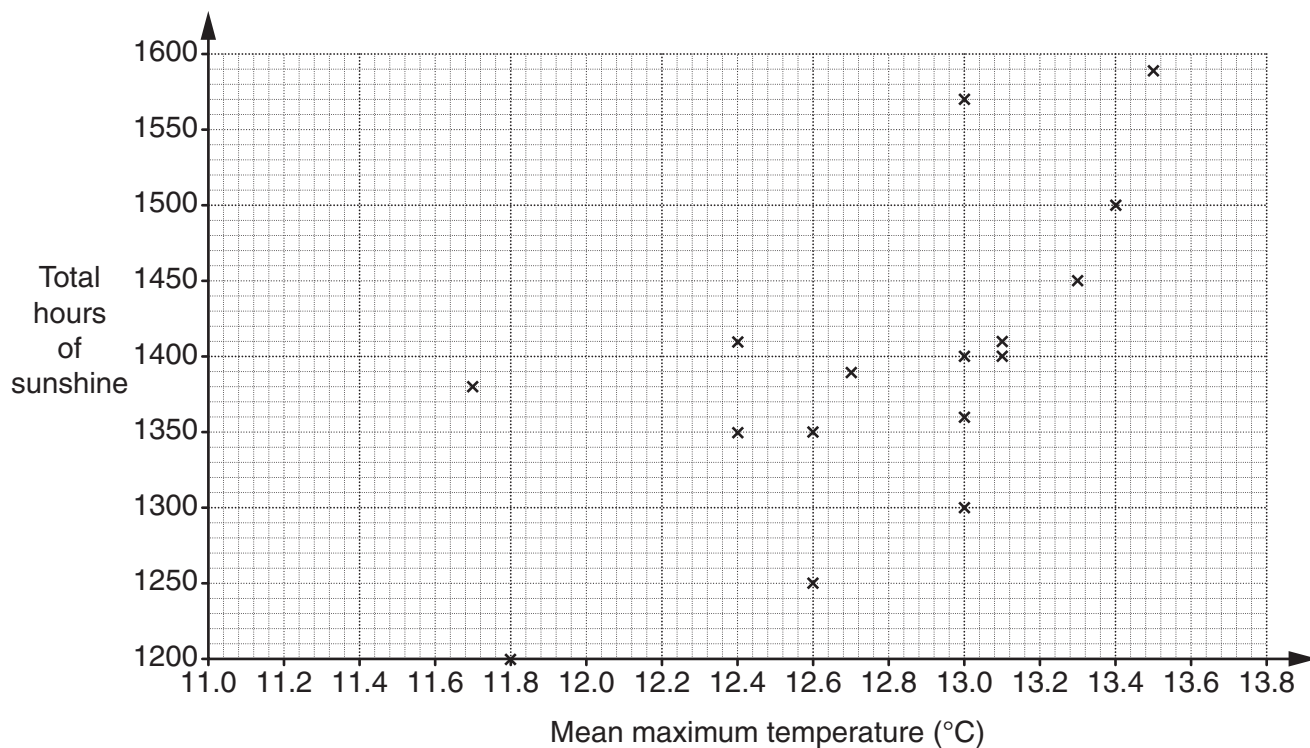


- 1 This table shows the mean maximum temperature and the total hours of sunshine recorded at one UK weather centre each year from 1993 to 2013.

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Mean maximum temperature (°C)	11.8	12.4	13.0	11.7	13.1	12.6	13.0	12.6	12.4	13.0	13.5
Total hours of sunshine	1200	1350	1570	1380	1410	1250	1400	1350	1410	1300	1590

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Mean maximum temperature (°C)	13.0	13.1	13.4	13.3	12.7	12.8	11.7	13.3	12.4	12.4
Total hours of sunshine	1360	1400	1500	1450	1390	1470	1460	1410	1340	1420

The results for the first 16 years are plotted on the scatter diagram.



(a) Complete the scatter diagram. [2]

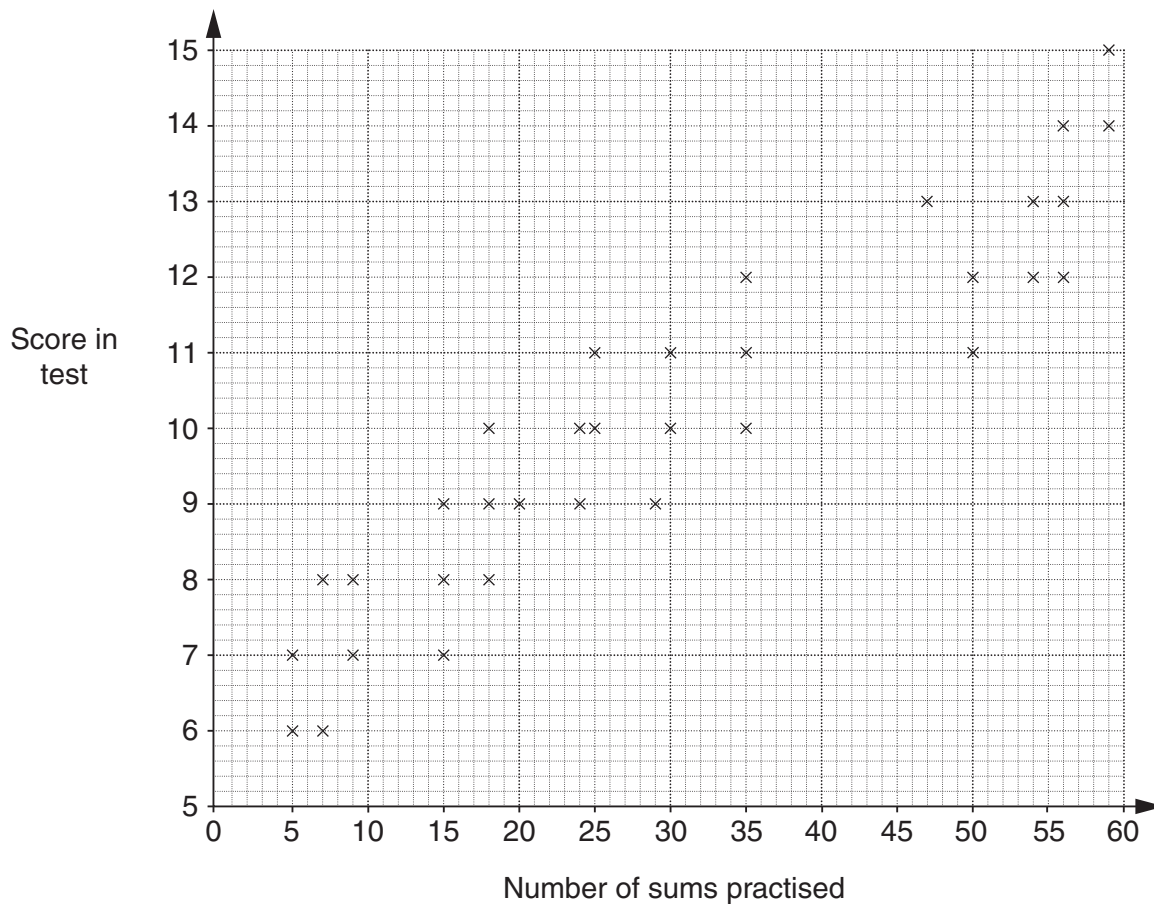
(b) Describe the strength and type of correlation between mean maximum temperature and total hours of sunshine.

..... [2]

(c) Is it appropriate to draw a line of best fit on your scatter diagram? Explain your answer.

.....  
..... [1]

- 2 Pia uses a computer to help her revise.  
 Each time, Pia practises a number of sums and then takes a test, scored out of 15.  
 For each test, Pia records the number of sums practised and the score on the test.  
 She draws this scatter graph.



One day, Pia practised 42 sums but did not have time to take the test.  
 She decides to use a line of best fit to estimate her likely score in the test.

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

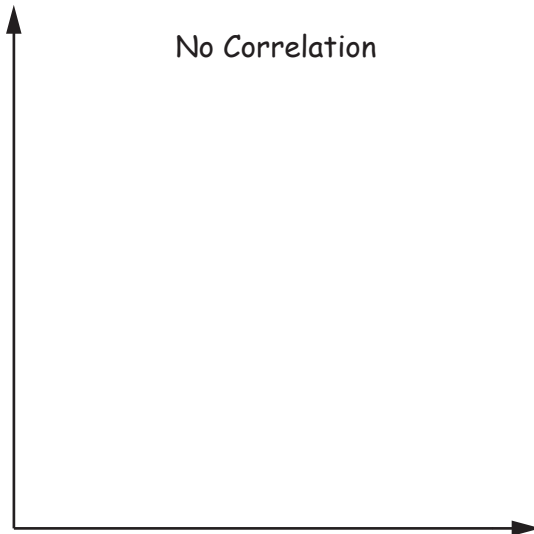
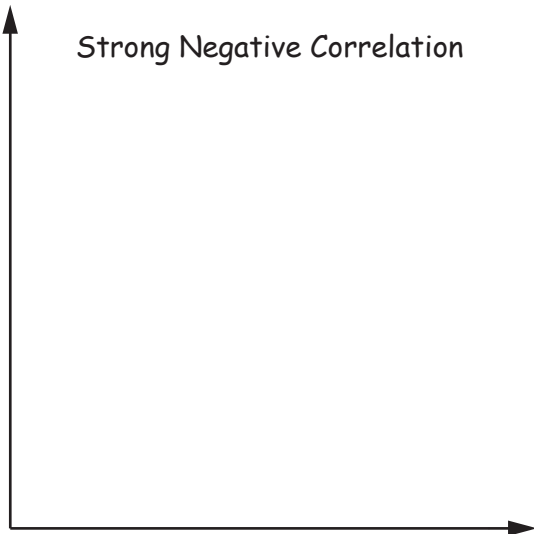
(b) Use your line of best fit to estimate a score for Pia.

(b) ..... [1]

(c) What type of correlation is shown?

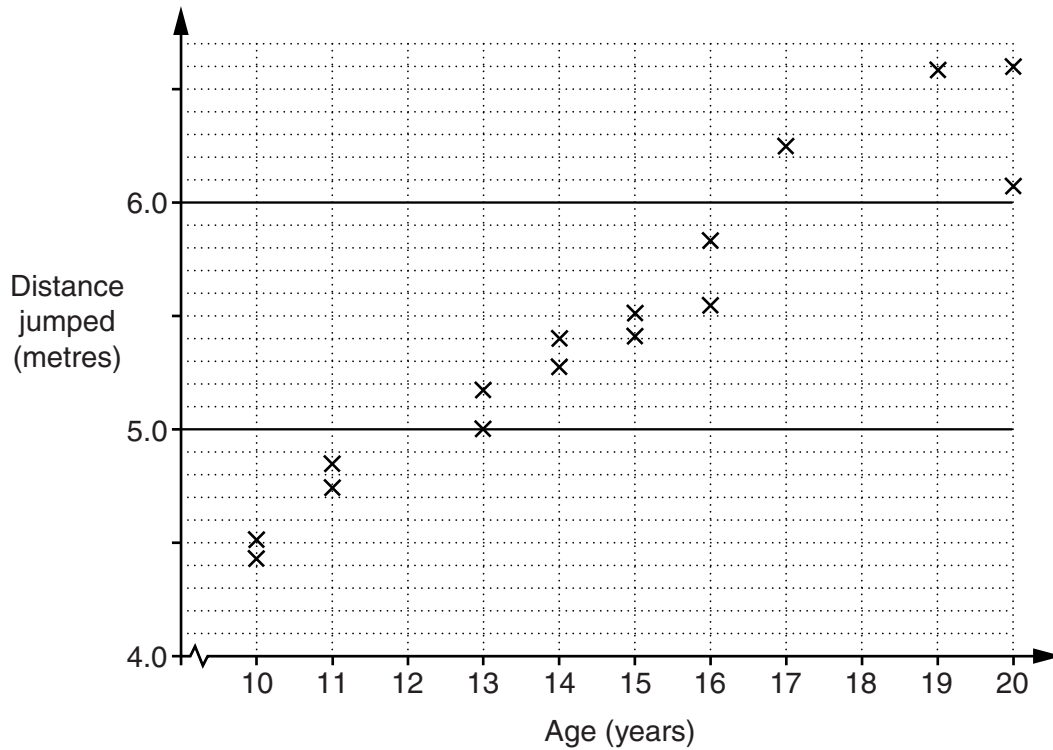
(c) ..... [1]

3 Draw at least 10 crosses ( $\times$ ) on each grid to produce scatter graphs that show the following.



[3]

- 4 This scatter graph represents the ages of 16 young people and the distance they jumped in a long jump competition.



The ages of two more competitors and the distance each jumped are given below.

Age (years)	Distance jumped (m)
17	5.45
19	5.80

- (a) Plot these values on the scatter graph. [2]
- (b) Draw a line of best fit on your scatter graph. [1]
- (c) Marco, aged 12, and Carl, aged 18, also took part in the competition.
  - (i) Use your line of best fit to estimate the distance each jumped.

(c)(i) Marco \_\_\_\_\_ m

Carl \_\_\_\_\_ m [2]

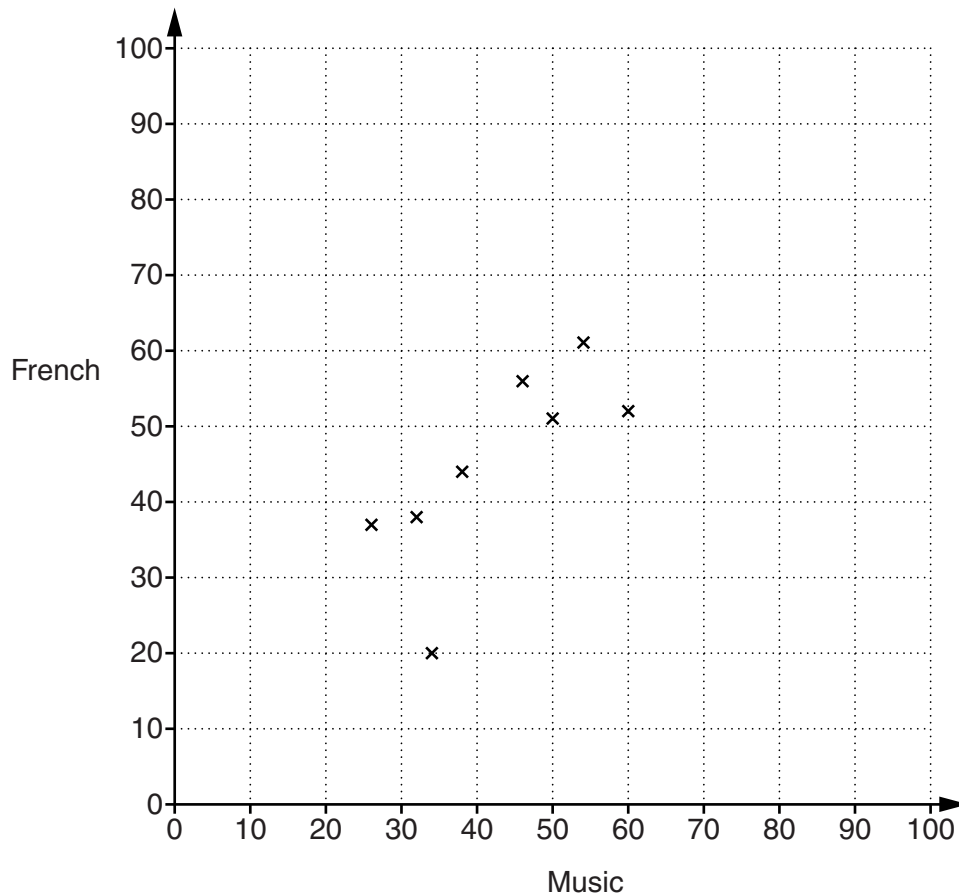
- (ii) Which estimate in part (c)(i) is likely to be closer to the actual distance jumped? Explain why.

\_\_\_\_\_ because \_\_\_\_\_

\_\_\_\_\_ [2]

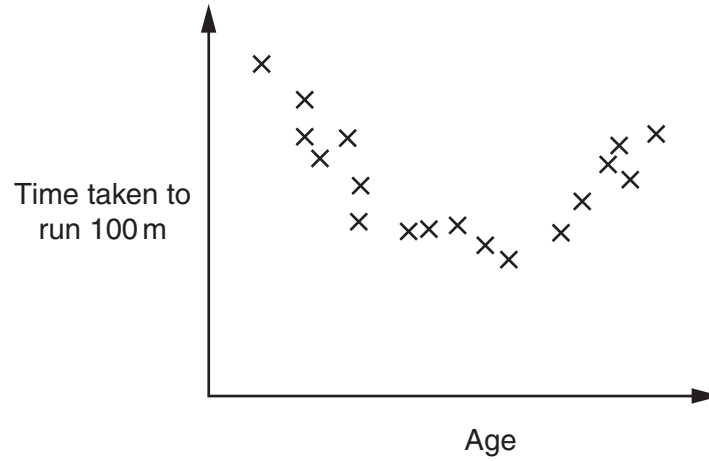
- 5 A group of students did tests in Music and French. Their results were as follows.

Music	34	54	32	46	50	60	26	38	68	77	45	70	62
French	20	61	38	56	51	52	37	44	74	83	89	72	71



- (a) Complete the scatter graph to show these results. The first eight points have been plotted for you. [2]
- (b) Draw a line of best fit on your scatter graph. [1]
- (c) Describe the correlation shown by the graph. [1]
- (c) \_\_\_\_\_ [1]
- (d) One of the students in the group, Guillaume, is French and always does much better in French than Music. Draw a ring round the cross that represents Guillaume's results. [1]

- 6 This scatter graph shows the time taken to run 100 metres plotted against age for a group of 18 people.



Lizzie says that, for these people, there is **no correlation** between age and time taken to run 100m.

Parand says that, for these people, there **is a relationship** between age and time taken to run 100m.

Is Lizzie correct? Is Parand correct?  
Explain your conclusions clearly.

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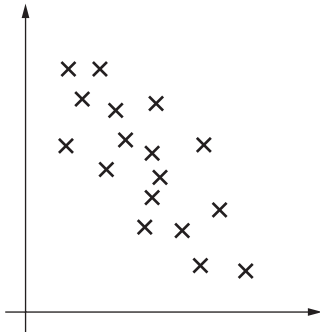
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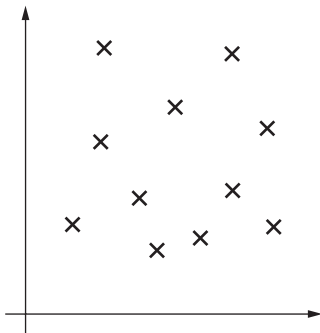
[4]

- 7 (a) Describe the correlation shown in each of these scatter graphs.  
If appropriate, also describe the strength of the correlation.



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.....



.....

.....

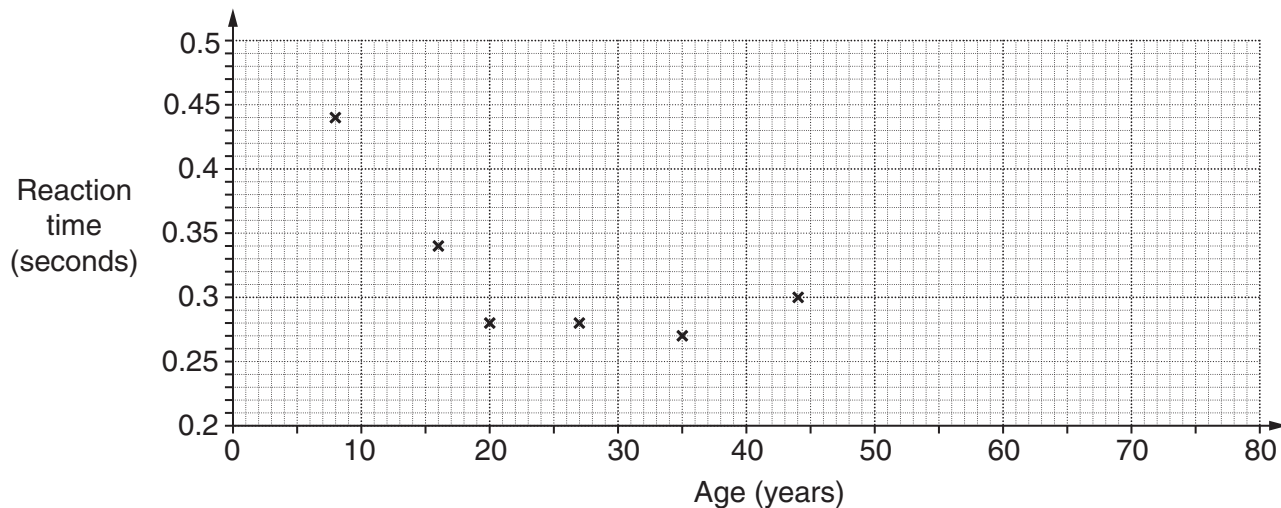
[3]



- (b) A student measures the reaction time for each of ten people of different ages. The results are given in this table.

Age (years)	8	16	20	27	35	44	56	65	70	79
Reaction time (seconds)	0.44	0.34	0.28	0.28	0.27	0.30	0.28	0.34	0.38	0.40

The results are plotted on a scatter graph.



- (i) Complete the scatter graph. The first six results have been plotted for you. [2]

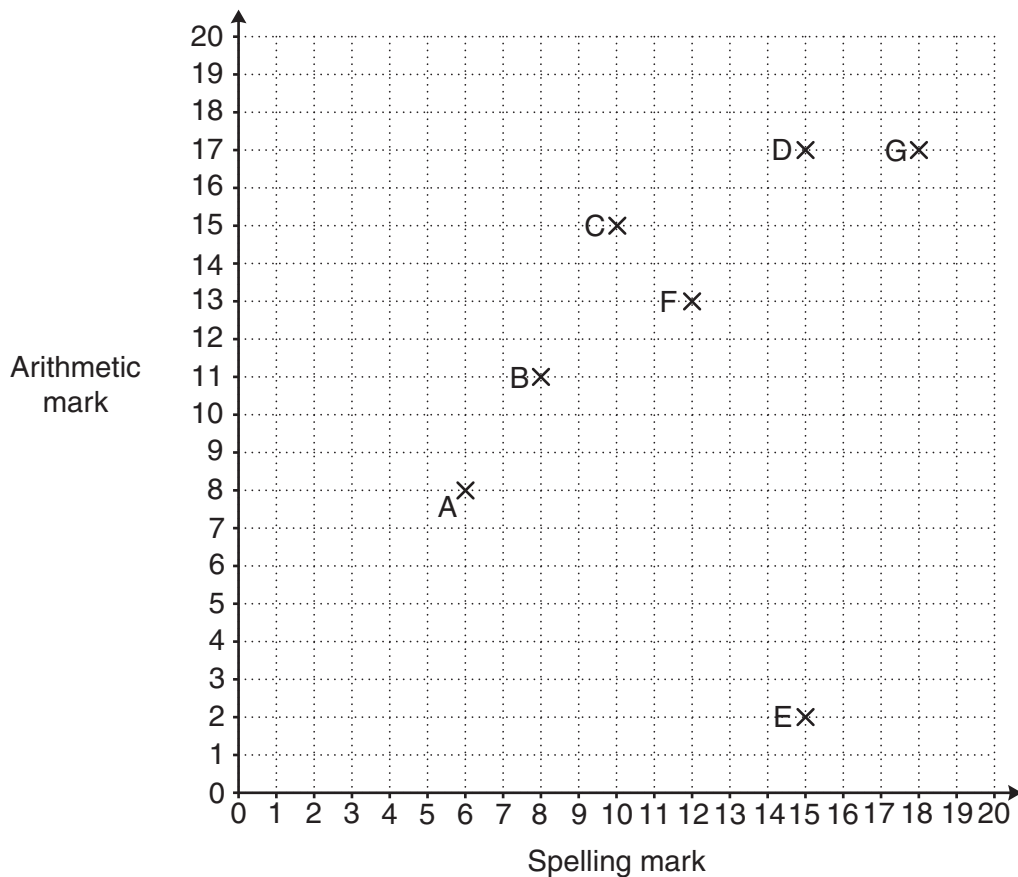
- (ii) Why is it not sensible to draw a line of best fit?

.....  
 ..... [1]

- (iii) Describe the relationship between age and reaction time shown by your graph.

.....  
 ..... [1]

- 8 Ten primary school children each did a spelling test and an arithmetic test. Each test was marked out of 20. The marks of seven of the children (A to G) are shown on the scatter graph.



- (a) The marks of the other three children are given below.

Child	Spelling mark	Arithmetic mark
H	11	14
J	18	19
K	10	12

Plot and label these values on the scatter graph.

[2]

- (b) (i) Describe the type of correlation shown in your diagram.

(b)(i) \_\_\_\_\_ [1]

- (ii) Give a reason why it is difficult to be sure of the strength of the correlation.

\_\_\_\_\_ [1]

- (c) Suki scored exactly 50% more marks in her arithmetic test than in her spelling test.

Which letter represents Suki?

(c) \_\_\_\_\_ [1]

- (d) Pedro learnt his spellings but not his arithmetic.  
His arithmetic score was much worse than his spelling score.

Which letter represents Pedro?

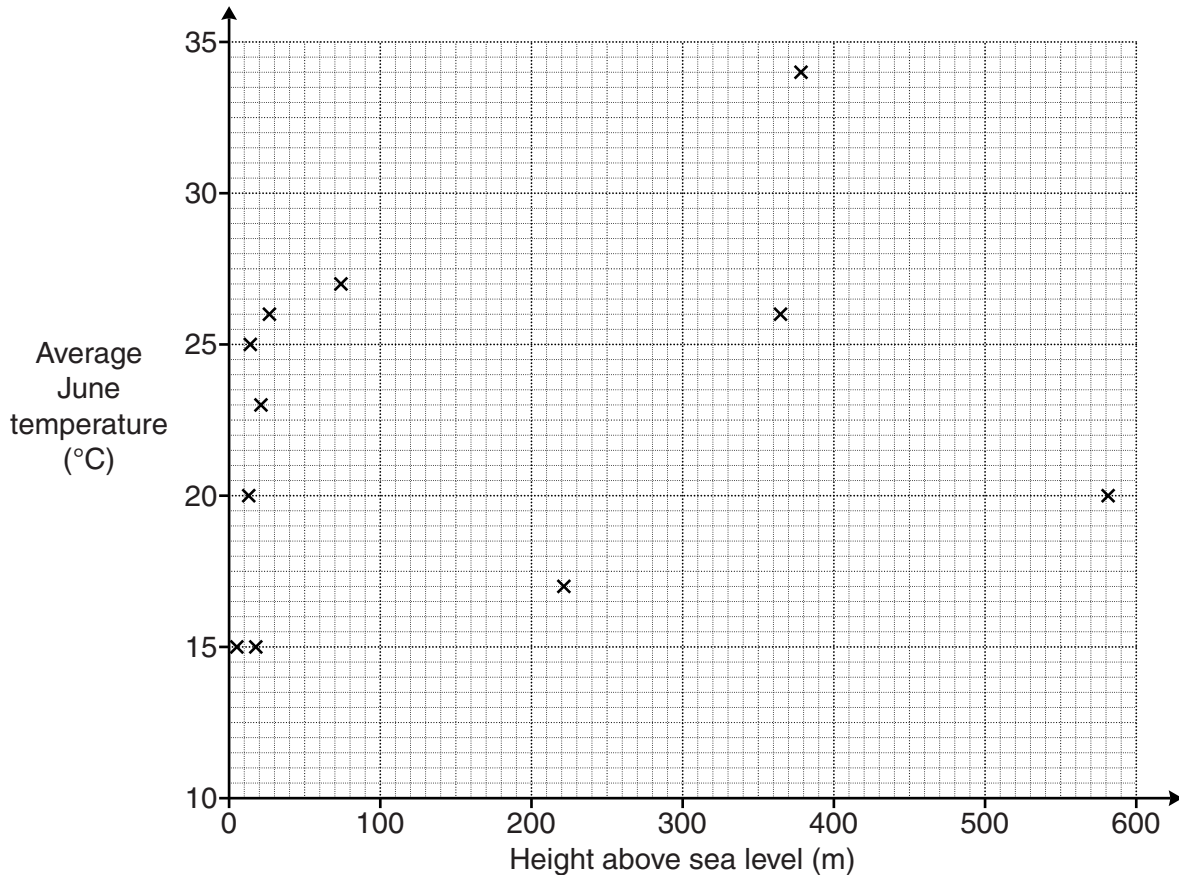
(d) \_\_\_\_\_ [1]

9 Lizzie and Sam discuss where to go on holiday. They collect this data about cities in the Northern Hemisphere from the Internet.

City	Latitude (degrees)	Average June temperature (°C)	Height above sea level (m)
Oslo	59	15	17
Copenhagen	55	15	4
Dijon	47	17	221
Madrid	40	20	581
Rome	41	20	13
Athens	37	23	21
Cairo	30	27	74
Khartoum	15	34	379
Freetown	8	26	27
Bangui	4	26	365
Libreville	0	25	14

(a) Lizzie wants to go to somewhere that is near to sea level as she thinks places that are higher will be cooler.

Lizzie draws a scatter graph of average June temperature against height above sea level for these cities.



- (i) Describe the relationship between height above sea level and average June temperature shown on the scatter diagram.

(a)(i) \_\_\_\_\_ [1]

- (ii) Does the scatter diagram support Lizzie's view about the relationship between temperature and height above sea level?  
Explain your answer.

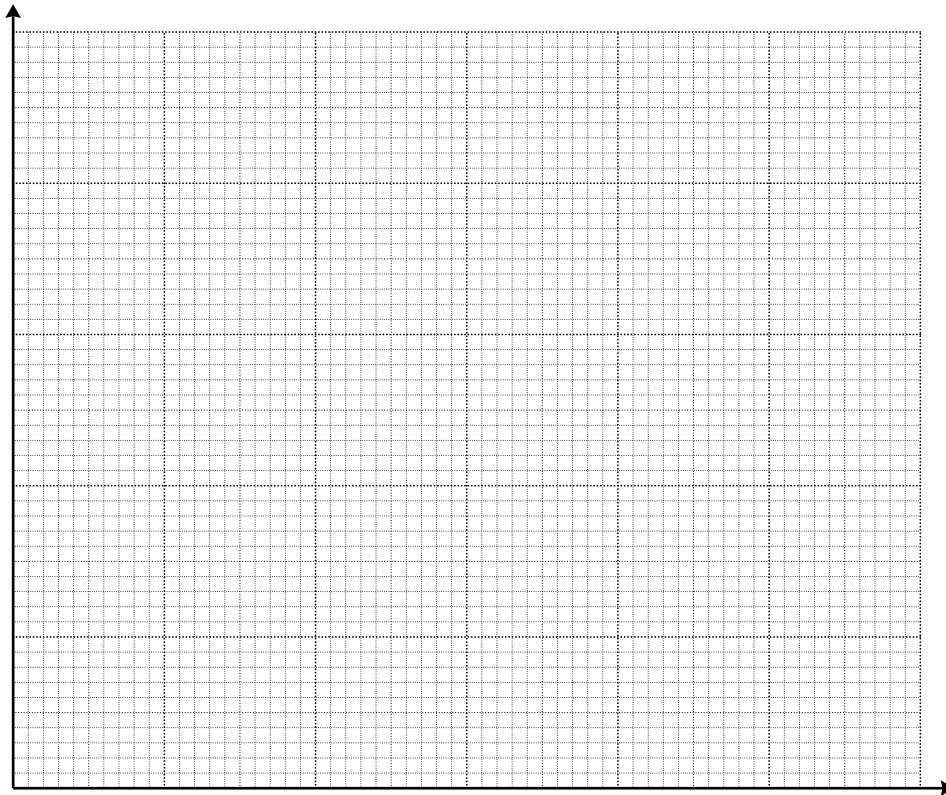
\_\_\_\_\_ because \_\_\_\_\_

\_\_\_\_\_ [1]

- (b) Sam wants to go somewhere near the equator as he thinks these places will be warmer.

'Latitude' gives information about how far from the equator you are. So Libreville, at latitude 0 degrees, is on the equator and Oslo, at latitude 59 degrees, is a long way north of the equator.

- (i) Use Latitude and Average June temperatures to draw and label another scatter diagram to test Sam's idea.



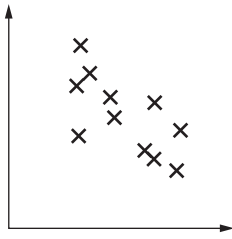
[4]

- (ii) Does your scatter diagram support Sam's view about the relationship between temperature and distance from the equator?  
Explain your answer.

\_\_\_\_\_ because \_\_\_\_\_

\_\_\_\_\_ [2]

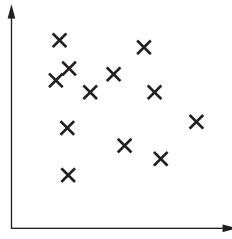
10 Describe **fully** the correlation shown in each scatter graph.




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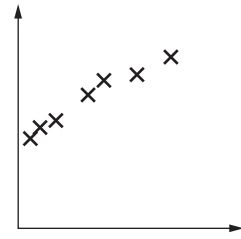
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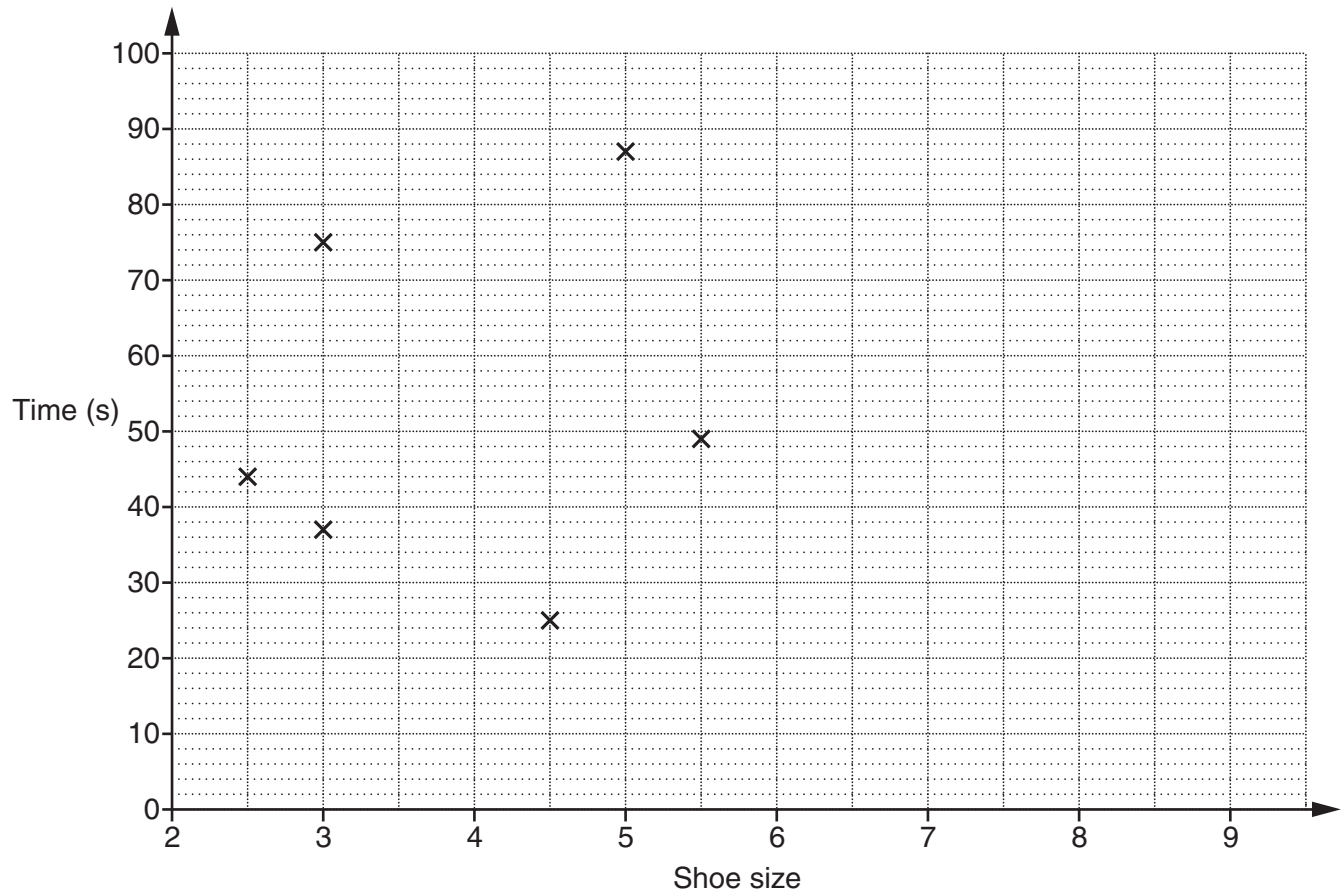


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[3]

- 11 Rajneev records data for ten students in her school. She records their shoe size and the time it takes them to complete a puzzle.

Shoe size	2½	3	3	4½	5	5½	6	6	7½	9
Time (s)	44	37	75	25	87	49	34	62	31	43



The first 6 points are plotted on the scatter diagram.

- (a) Complete the scatter diagram. [2]
- (b) Choose from the following to describe the diagram.  
Put a ring around your answer.

Negative  
correlation

No  
correlation

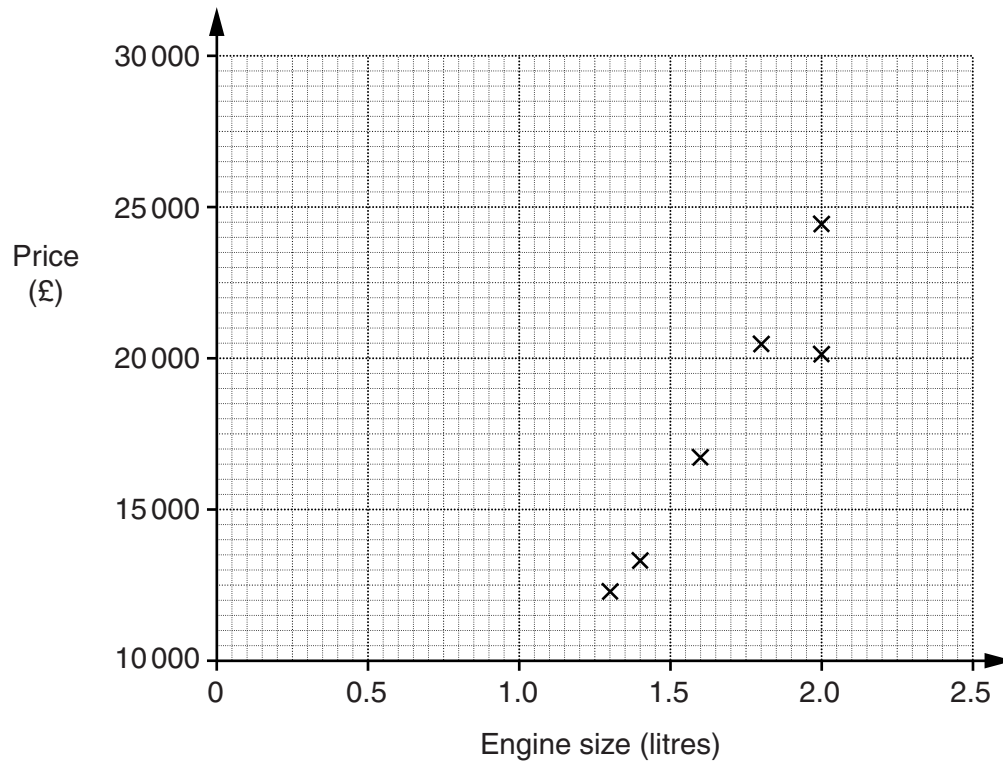
Positive  
correlation

[1]

12 A website gives the price and engine size for different models of one manufacturer's cars.

Engine size (litres)	Price (£)
1.3	12 360
1.4	13 345
1.6	16 695
1.8	20 495
2	20 095
2	24 295
2	29 945
2.2	27 345
2.5	25 745

- (a) Complete the scatter graph below.  
The first six points have been plotted for you.



[2]

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

[1]



(c) Describe the correlation between price and engine size.

(c) \_\_\_\_\_ [1]

(d) This manufacturer is planning to produce a car with a 1.7 litre engine.

What might you expect its price to be?

(d) £ \_\_\_\_\_ [1]

(e) One of the cars is a sports model that is more expensive than other cars with the same engine size.

Put a ring round the point that represents the sports model. [1]