2021 ASSESSMENT MATERIALS

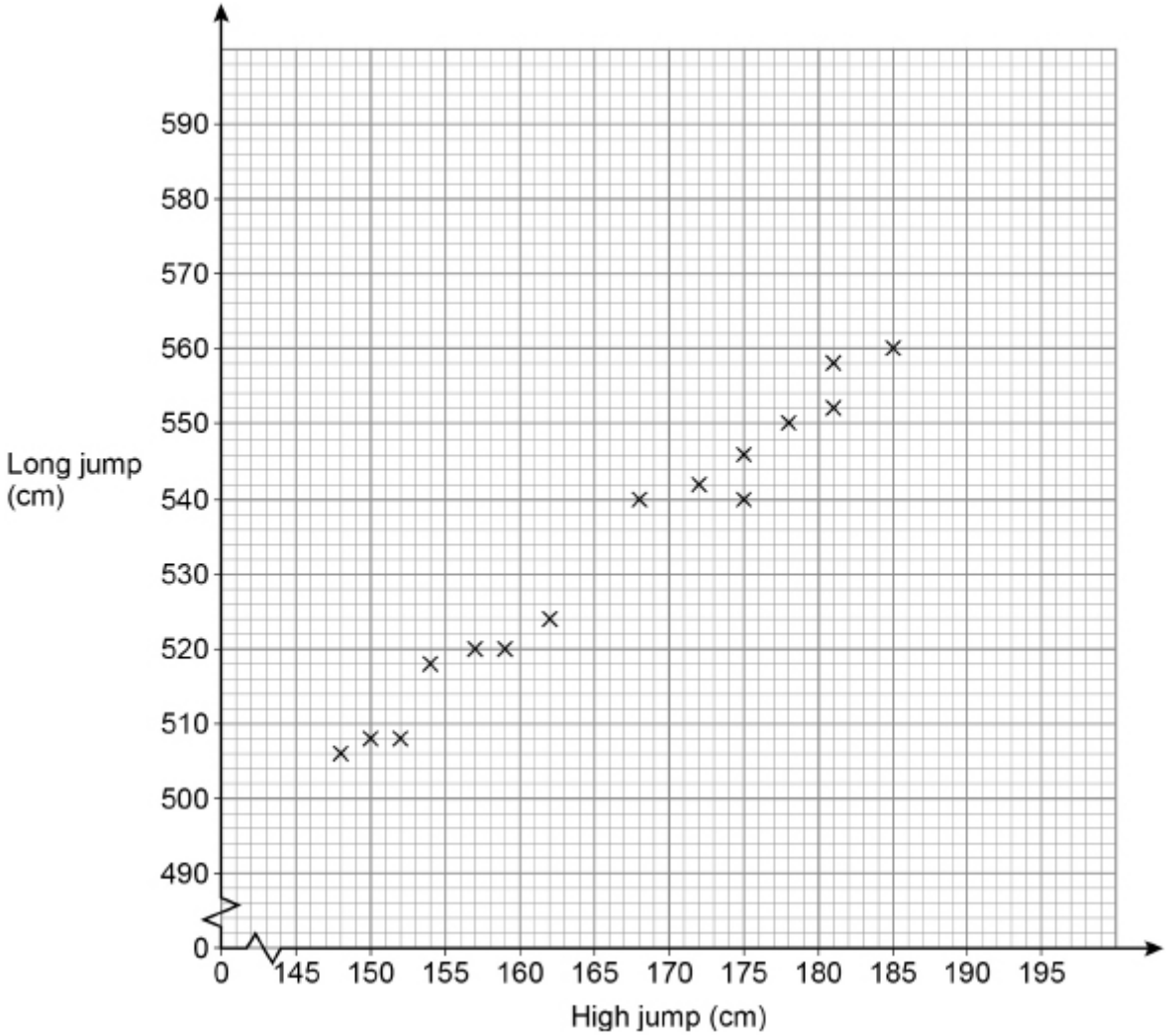
GCSE
MATHEMATICS (8300)
COMMON GRADES 4 & 5

Probability and Statistics

Total number of marks: 33 per optional item

Q25a

The scatter graph shows the best high jump and the best long jump for 15 boys.

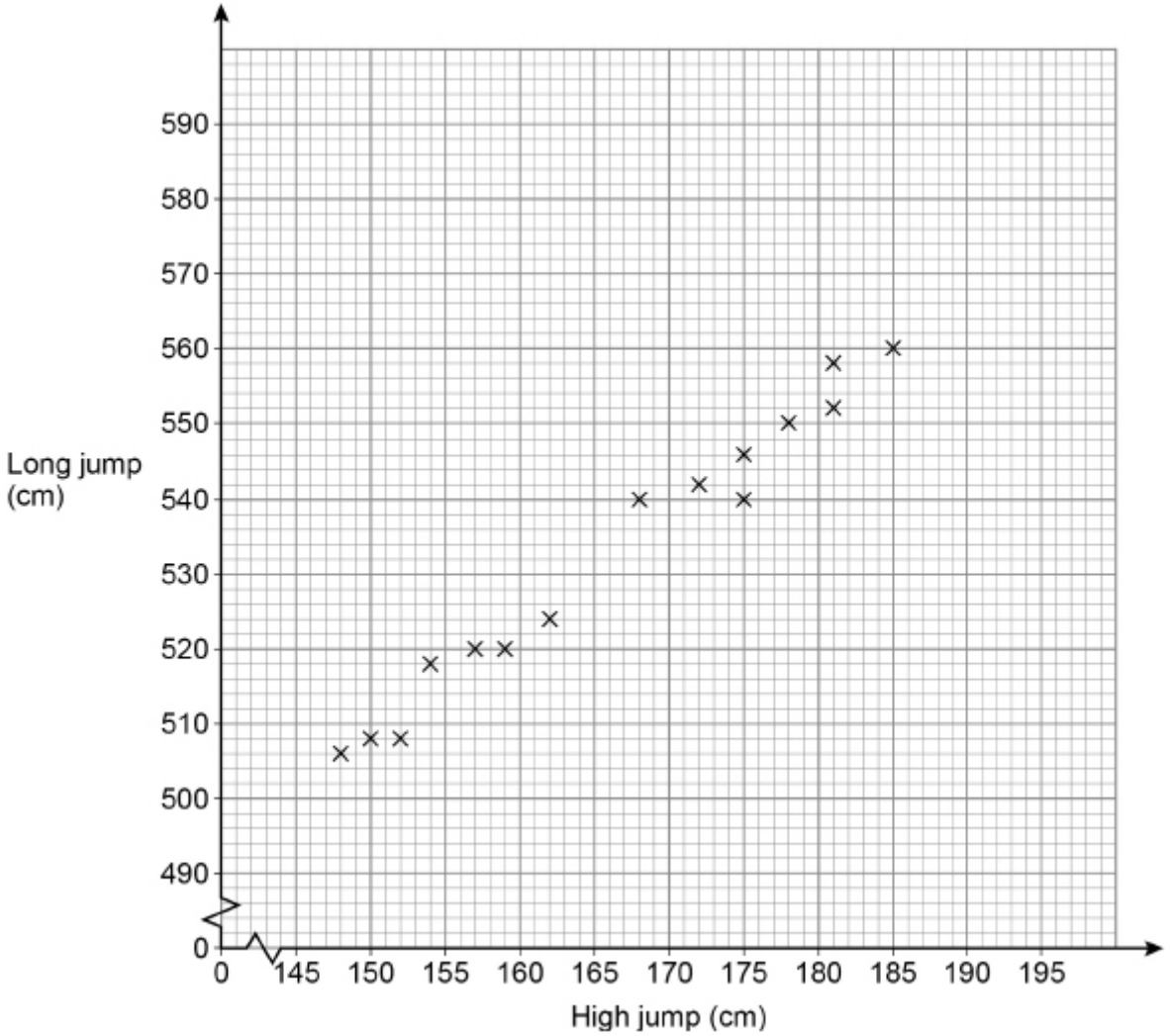


(a) Write down the type of correlation shown.

(Total 1 mark)

Q25b

The scatter graph shows the best high jump and the best long jump for 15 boys.



(b) Liam has a best high jump of 166 cm

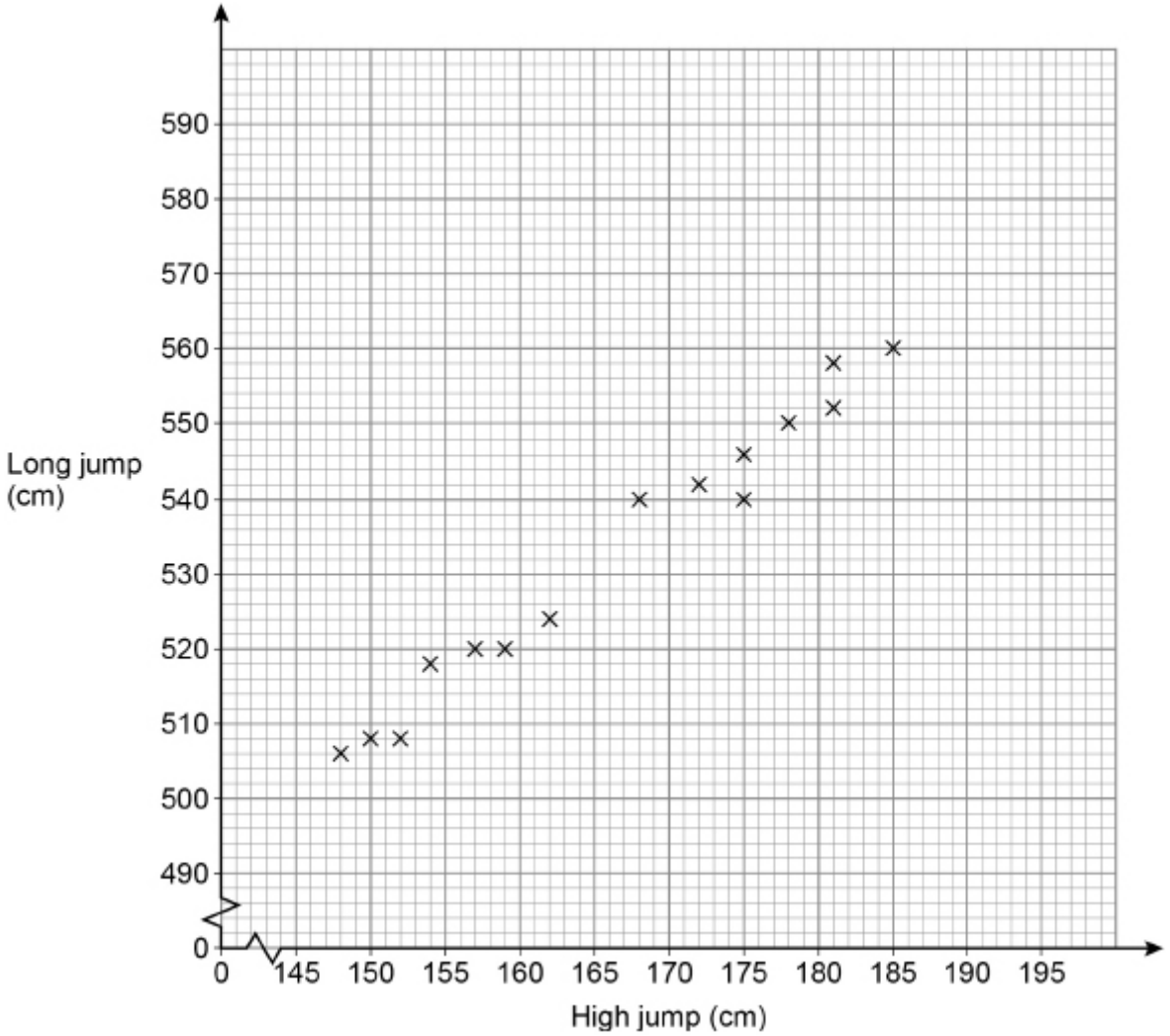
Use a line of best fit to estimate his best long jump.

Answer _____ cm

(Total 2 marks)

Q25c

The scatter graph shows the best high jump and the best long jump for 15 boys.



(c) Another boy has a best high jump of 195 cm

Give a reason why you should **not** use a line of best fit to estimate his best long jump.

(Total 1 mark)

Q7

Here is some information about the times taken by 40 people to fill in a form.

Time, t minutes	Number of people
$0 < t \leq 5$	3
$5 < t \leq 10$	9
$10 < t \leq 15$	11
$15 < t \leq 20$	17

In which class interval is the median?

Circle your answer.

$0 < t \leq 5$ $\quad$ $5 < t \leq 10$ $\quad$ $10 < t \leq 15$ $\quad$ $15 < t \leq 20$

(Total 1 mark)

Q18

Here are five cards.

One of the cards is removed.

The mean of the numbers on the remaining four cards is 6

Which card was removed?

You **must** show your working.

(Total 3 marks)

Q22a

Here is some information about 20 trains leaving a station.

Number of minutes late, t	Number of trains	Midpoint	
$0 \leq t < 5$	12		
$5 \leq t < 10$	7		
$10 \leq t < 15$	1		
$t \geq 15$	0		

(a) Work out an estimate of the mean number of minutes late.

Answer _____ minutes

(Total 3 marks)

Q22b

Here is some information about 20 trains leaving a station.

Number of minutes late, t	Number of trains	Midpoint	
$0 \leq t < 5$	12		
$5 \leq t < 10$	7		
$10 \leq t < 15$	1		
$t \geq 15$	0		

(b) The station manager looks at the information in more detail.

Number of minutes late, t	**Number of trains**
$0 \leq t < 2$	12
$2 \leq t < 4$	0
$4 \leq t < 6$	7
$6 \leq t < 8$	0
$8 \leq t < 10$	0
$10 \leq t < 12$	1

He works out an estimate of the mean using this information.

How does his estimate compare with the answer to part (a)?

Tick **one** box.

☐ Higher than part (a)

☐ Same as part (a)

☐ Lower than part (a)

☐ Not possible to tell

(Total 1 mark)

Q21a

An experiment is carried out 200 times.

The possible outcomes are K, L and M.

(a) Complete the table.

Outcome	K	L	M
Frequency	84	54	
Relative frequency	0.42		

(Total 2 marks)

Q21b

An experiment is carried out 200 times.

The possible outcomes are K, L and M.

(b) Altogether, the experiment is carried out 500 times.

How many times would you expect the outcome to be K?

(Total 2 marks)

Q14a

There are 135 passengers on a plane.

3 of the passengers in Business Class are flying for the first time.

In total, there are 15 passengers in Business Class.

$\frac{1}{4}$ of the passengers **not** in Business Class are flying for the first time.

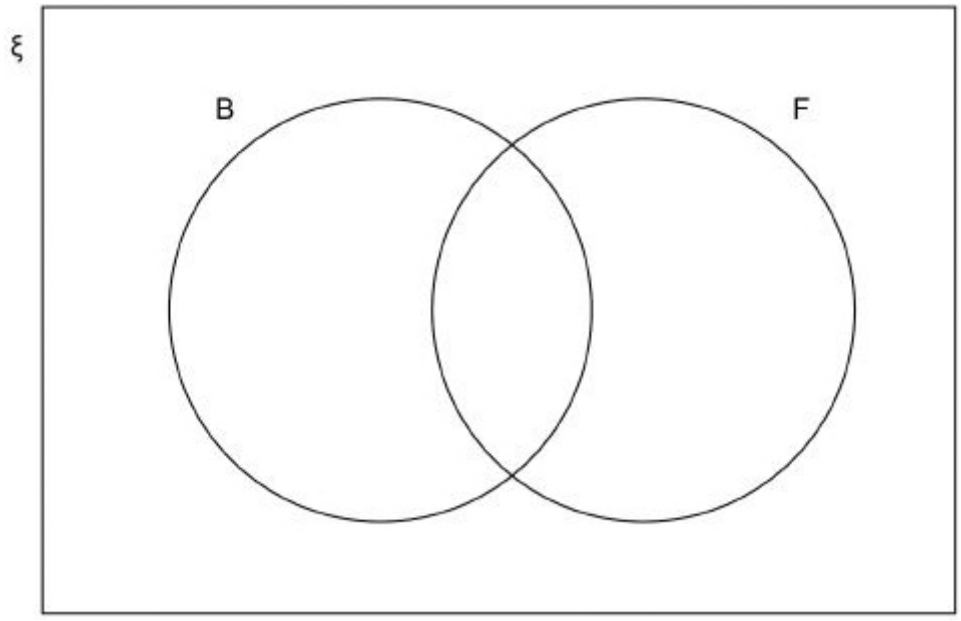
(a) In the Venn diagram,

ξ = passengers on the plane

B = passengers in Business Class

F = passengers flying for the first time.

Complete the Venn diagram.



(Total 4 marks)

Q14b

There are 135 passengers on a plane.

3 of the passengers in Business Class are flying for the first time.

In total, there are 15 passengers in Business Class.

$\frac{1}{4}$ of the passengers **not** in Business Class are flying for the first time.

(b) One of the passengers is chosen at random.

Write down the probability that the passenger is in Business Class.

(Total 1 mark)

Q17b

A shop sells ice creams.

Each ice cream has two scoops.

The possible flavours are vanilla (V), strawberry (S), chocolate (C) and mint (M).

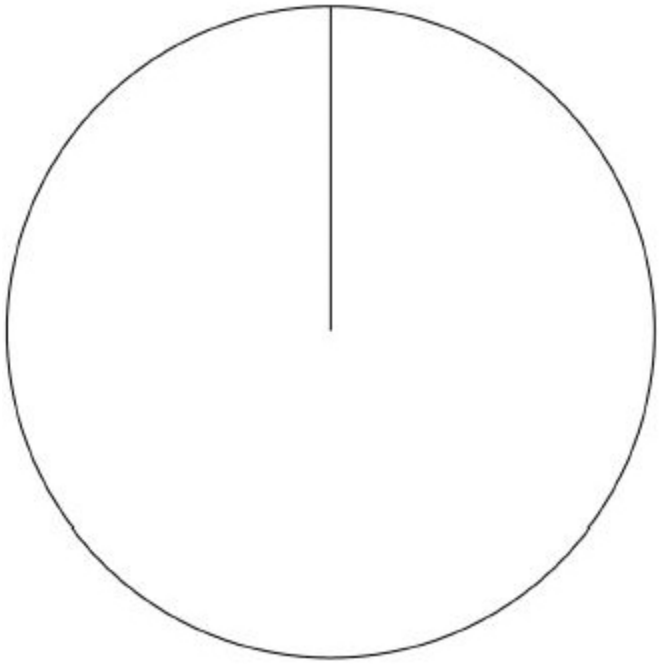
The two scoops can be the same flavour or different flavours.

(b) In one hour the shop sells 180 scoops of ice cream.

The number of scoops of each flavour is shown in the table.

Flavour	Vanilla	Strawberry	Chocolate	Mint
Number of scoops	45	75	50	10

Complete the pie chart to represent the data.



(Total 4 marks)

Q2

For a biased dice, $P(6) = \frac{3}{5}$

Circle the probability of two sixes when the dice is rolled twice.

$\frac{6}{25}$ $\frac{6}{10}$ $\frac{9}{25}$ $\frac{9}{5}$

(Total 1 mark)

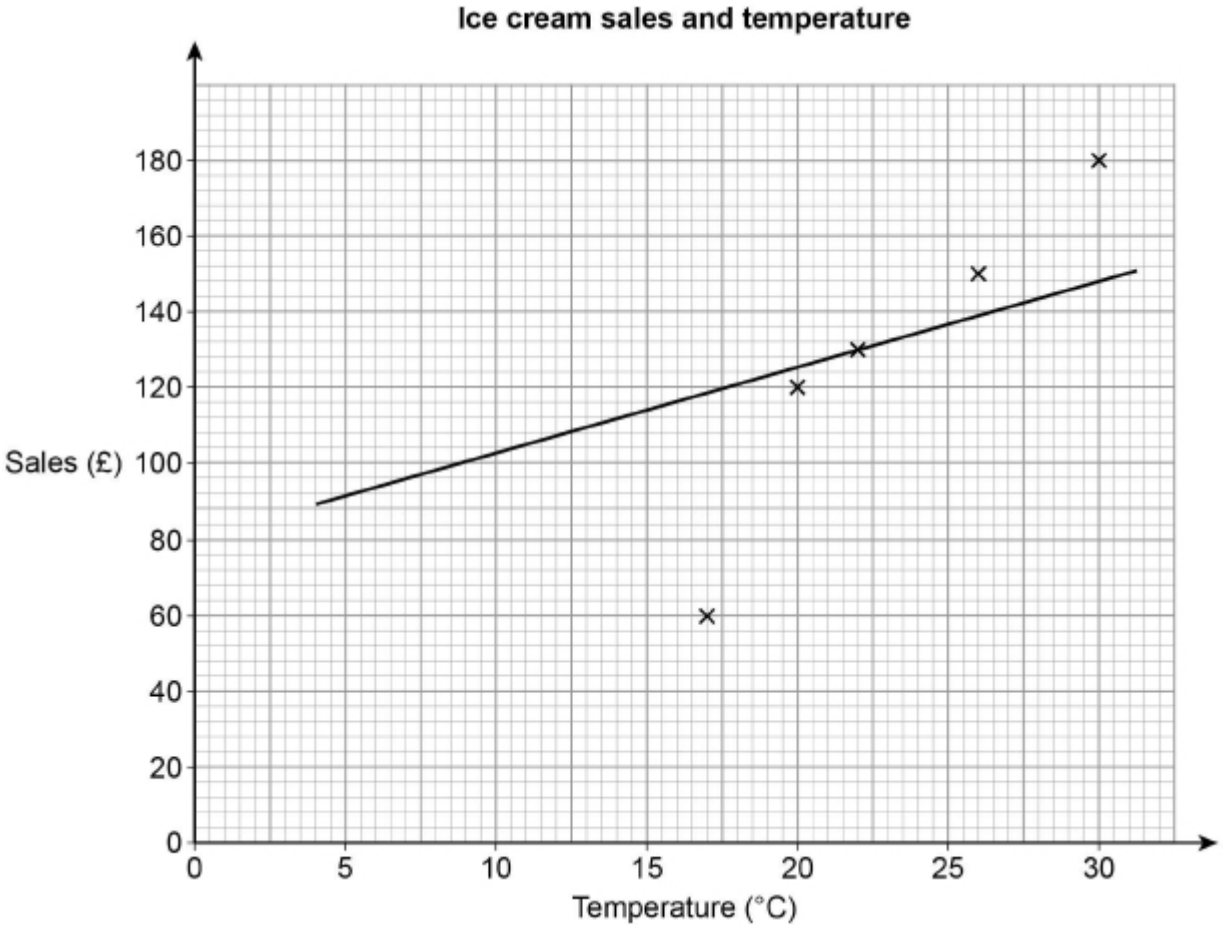
Q12a

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

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



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

Mistake 1

_____

_____

Mistake 2

_____

_____

(Total 2 marks)

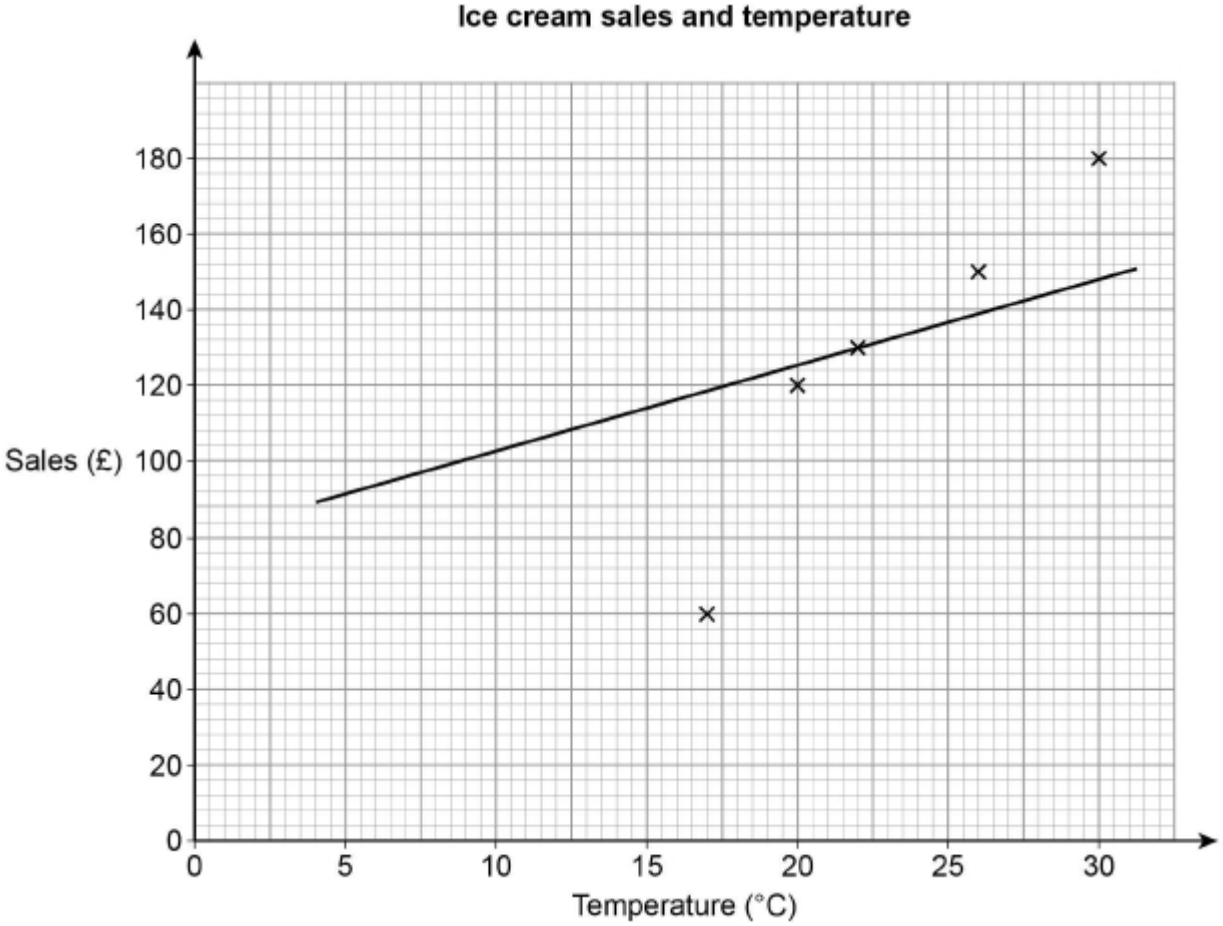
Q12b

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

He draws this scatter graph and line of best fit.



(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.

Yes	☐		No	☐

Give a reason to support your answer.

(Total 1 mark)

Q19

The following data comes from a large sample survey of the audience at a concert.

	Percentage	**Mean age (years)**	**Age range (years)**
Male	17%	20.3	6
Female	83%	25.7	28

Make **three** comparisons of males and females at the concert.

Use the headings given.

Proportion of the audience

Average age

Spread of ages

(Total 3 marks)

Q23

Which **one** of the following is discrete data?

Circle your answer.

Mass of a television	Time taken to deliver a television
Height of a television mast	Number of televisions sold

(Total 1 mark)