

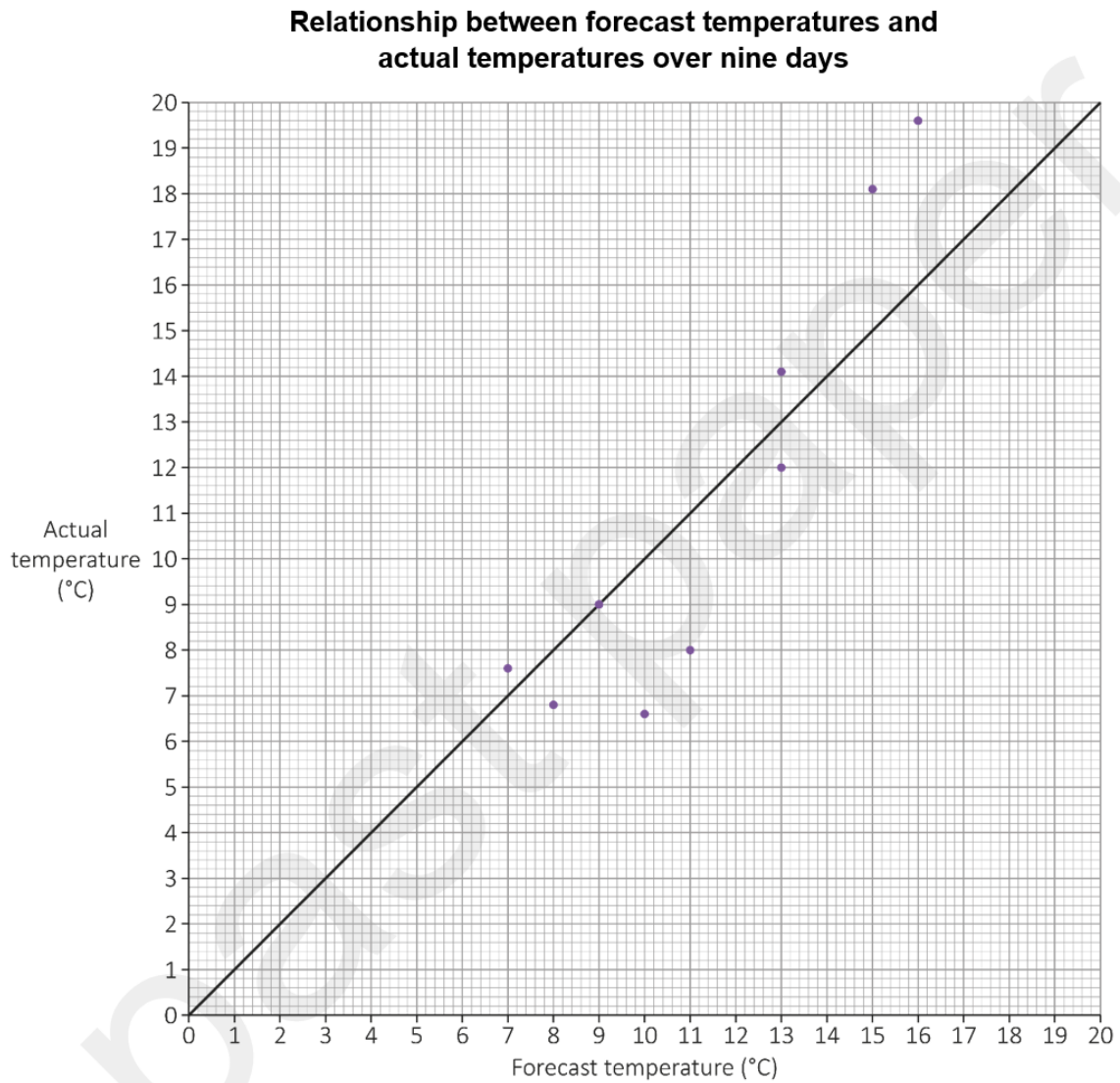
Non-calculator Questions

NCFE

1.

This scatter diagram shows the relationship between forecast temperatures and actual temperatures for the town over nine days.

The line represents the points at which the forecast and actual temperatures are the same.



A forecast is recorded as “accurate” if the actual temperature is within 2°C of the forecast temperature.

Zak writes that,

“The temperature forecast was accurate for less than 70% of the time”.

Is Zak correct?

Show how you decide.

[3 marks]



Your answer:



2.

Jackie is training for a cycle race.
She reads a cycling blog.

It says that cyclists should aim to keep their heart rate above 72% of their maximum heart rate.

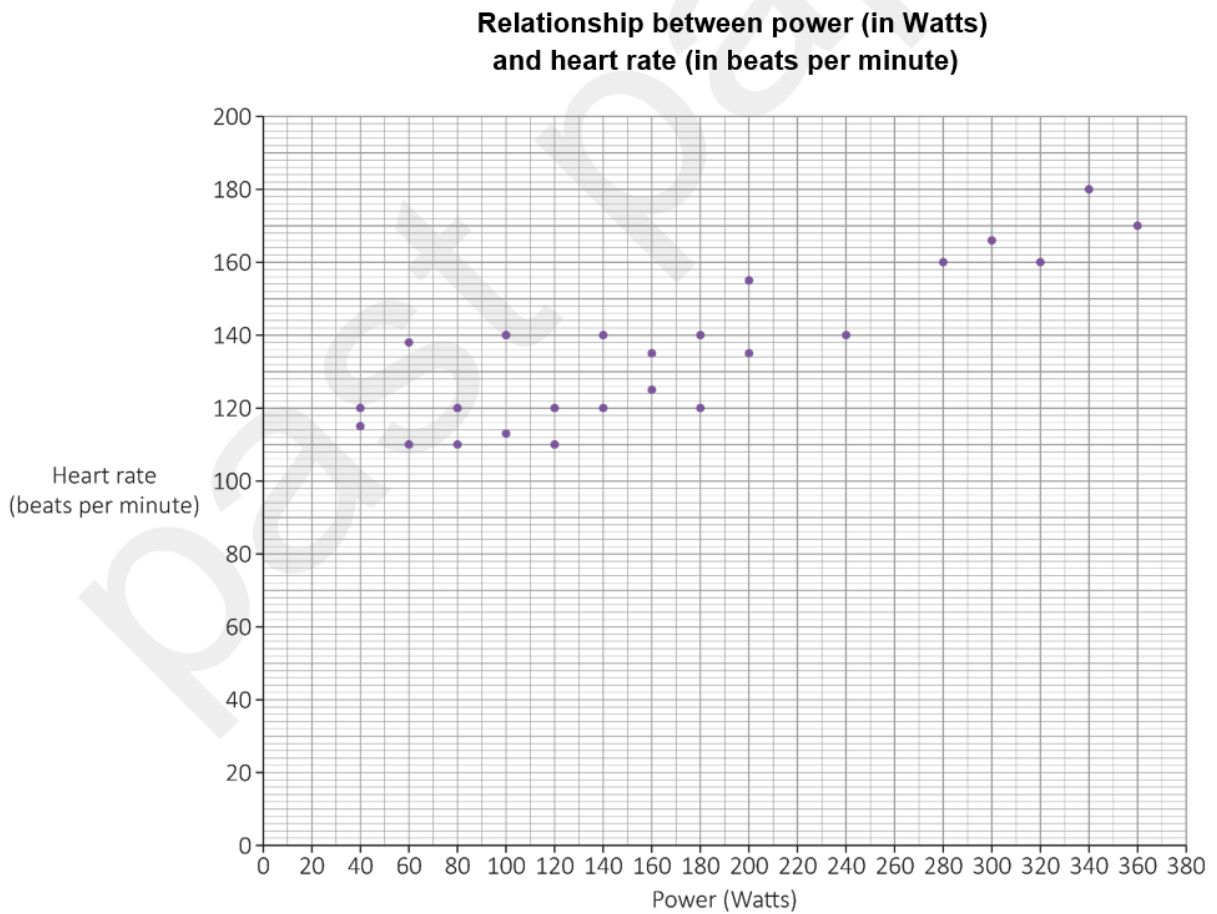
Jackie uses this formula to work out her maximum heart rate:

$$M = 191.5 - 0.007A^2$$

Where: M is the maximum heart rate in beats per minute
A is age in years.

Jackie is 25 years old.

This scatter diagram shows the relationship between power (in Watts) and heart rate (beats per minute):



To produce 100 Watts of power, a cyclist uses about 350 kilocalories per hour.

Estimate the number of kilocalories Jackie uses per hour if she cycles at 72% of her maximum heart rate.

[6 marks]

roast paper

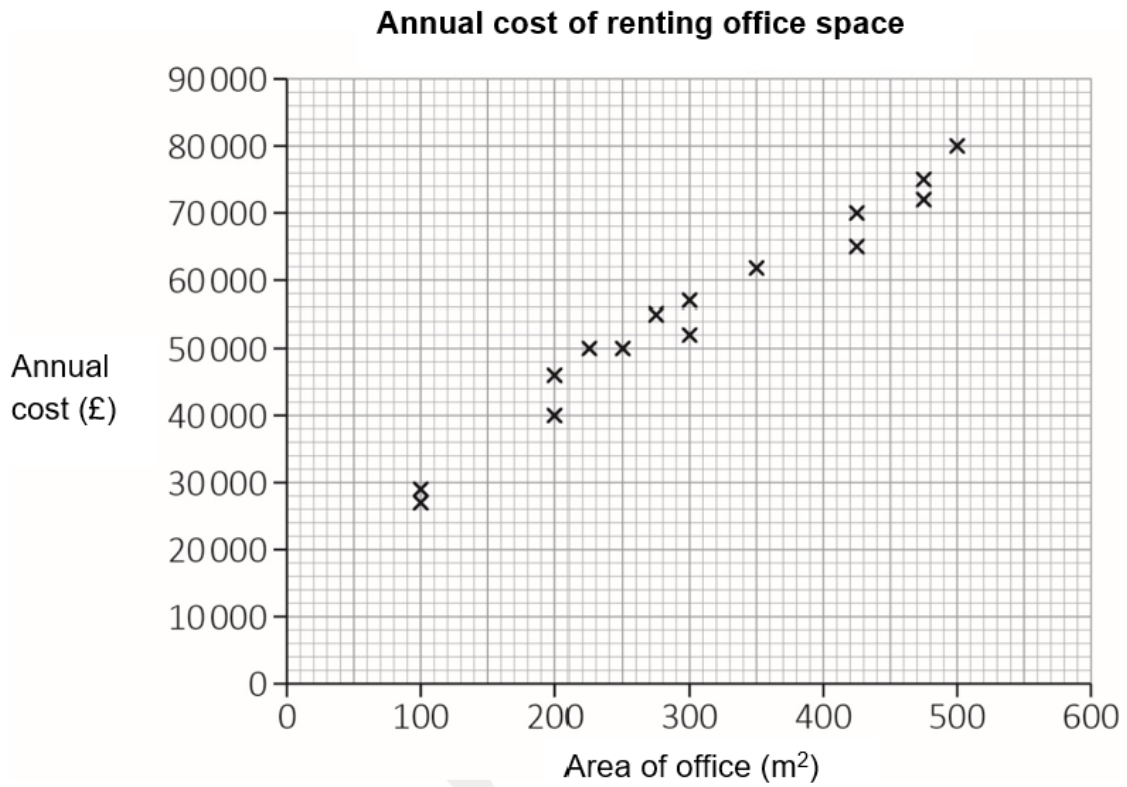
Your answer:

kilocalories

3.

Emma has been asked to estimate the cost of renting an office.

The graph shows how the **annual cost** varies with the total area of the office space.



The annual cost of renting office space will increase by 5.75% next year.

Estimate the cost of renting a 400 m² office next year.

[4 marks]



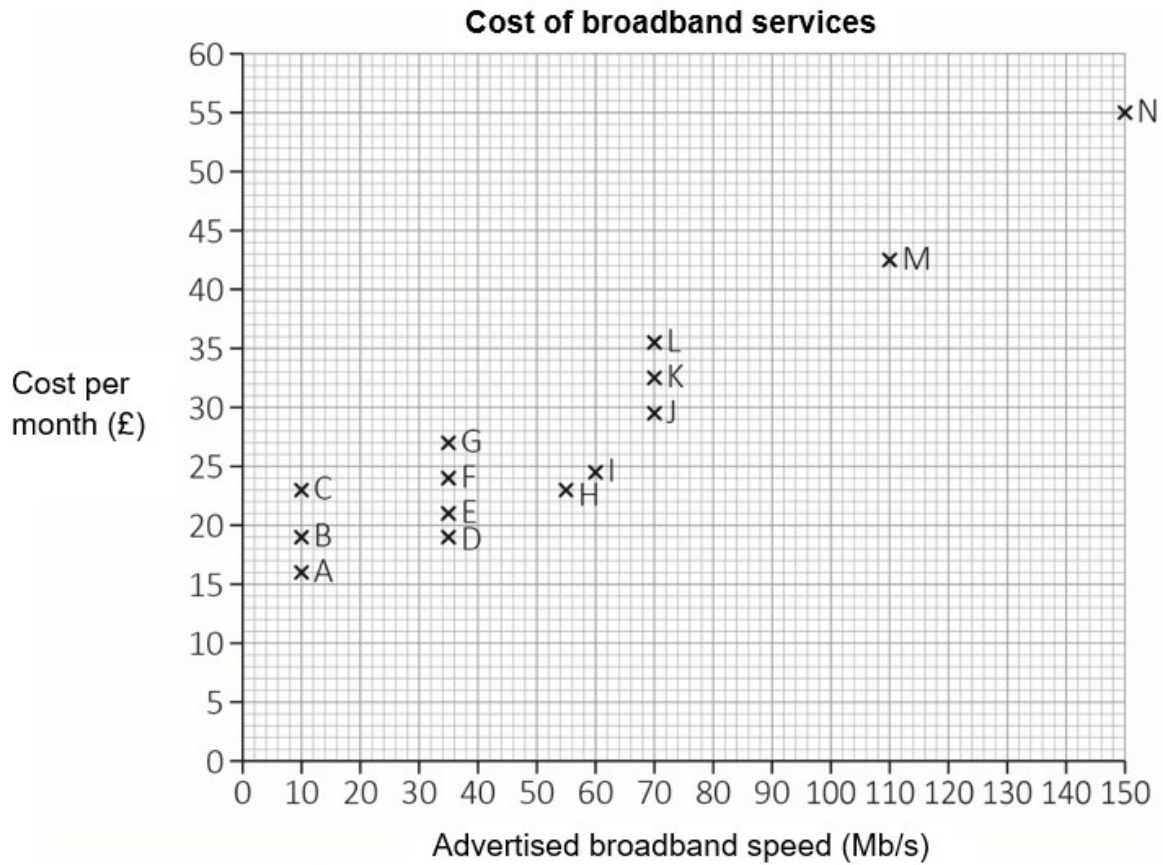
Your answer:

£

4.a)

Liam searches online for a choice of broadband services.

He finds this graph:



Broadband speed is measured in Mb/s (Megabits per second).

The lettered crosses in the graph represent the different services.

What is the modal speed of these broadband services?

[1 mark]

Your answer:

Mb/s

b)

Using the graph from **2 (d)**, what percentage of these broadband services cost over £25 per month?

Give your answer to 2 decimal places.

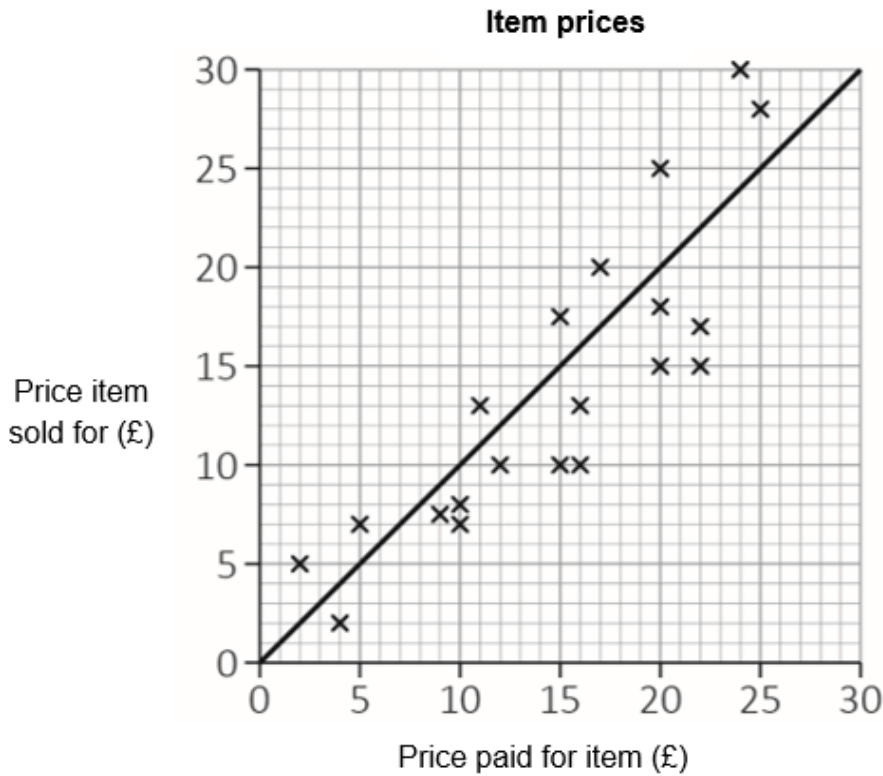
[2 marks]

Your answer:	%

5.

Hannah takes some items to a market to sell.

The scatter diagram shows the price Hannah paid for each item, and the amount she sells it for.



The line drawn on the scatter diagram marks the prices where Hannah makes no profit or loss.

Hannah thinks she made a profit on more than half of her items.

Is she correct? Explain your answer.

[2 marks]

Your answer:

6.

Model building blocks are sold in sets.

The scatter diagram shows information about more sets that Noah sees for sale:



Use the scatter diagram to estimate the price of a set containing 3500 blocks.

[2 marks]

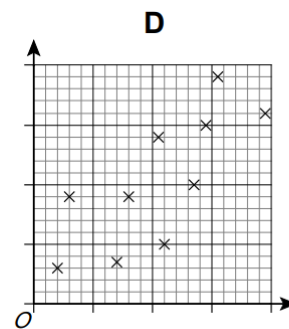
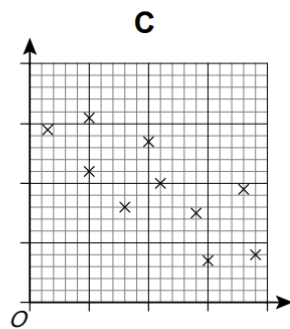
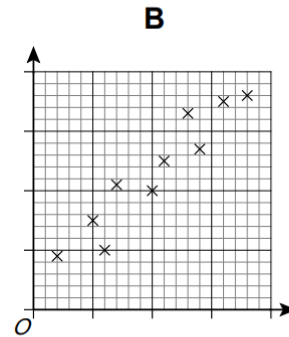
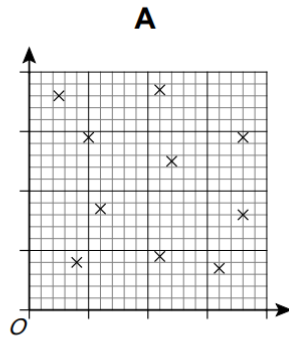
Your answer:

£

AQA

7.

A, **B**, **C** and **D** are scatter diagrams.



Which diagram shows negative correlation?
Circle your answer below.

[1 mark]

A

B

C

D

8.

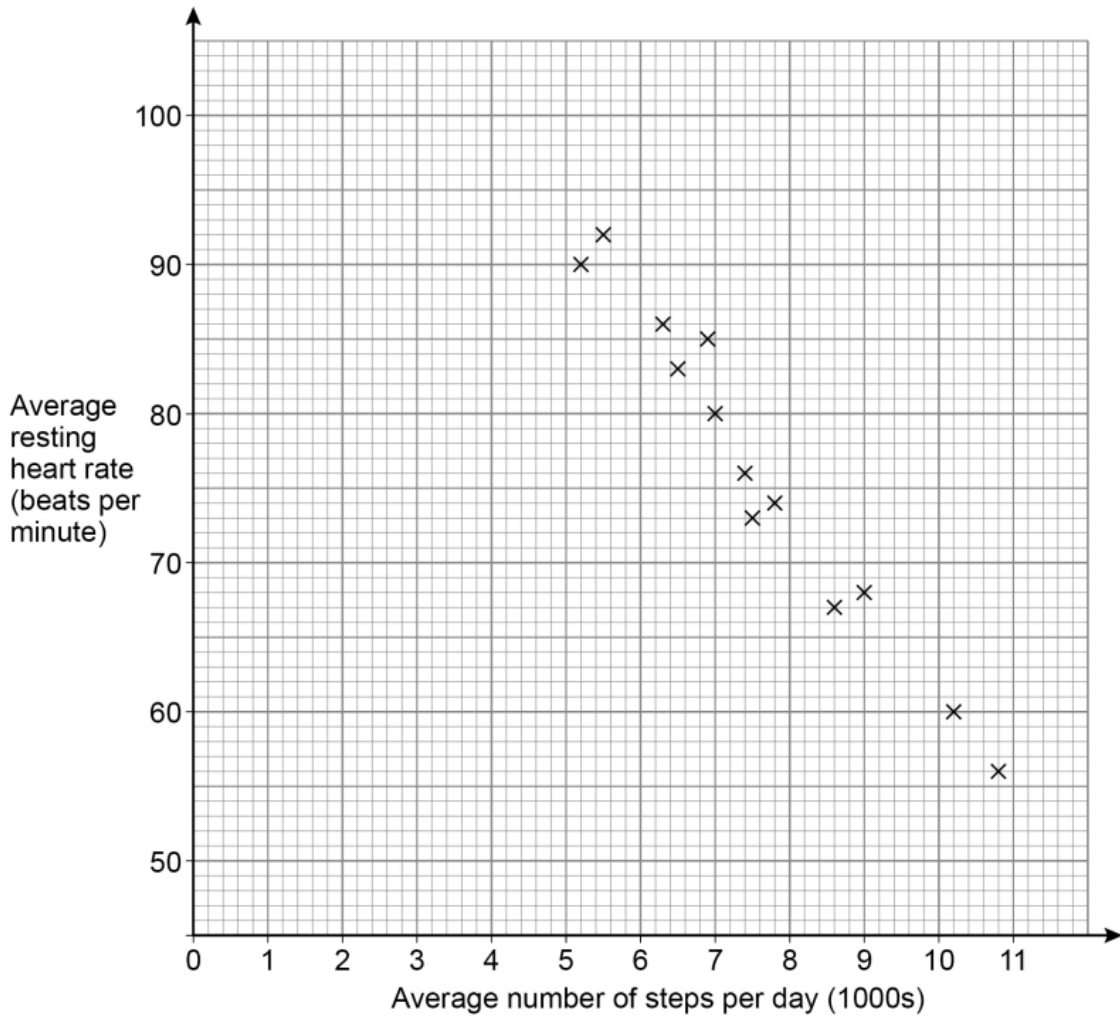
Fitness

Laura has a company with 16 employees.

Each employee has a device that records

- how many steps they take each day
- their resting heart rate.

(a) The scatter diagram represents the data for 13 of the employees.



The table shows the extra data for the other 3 employees.

Average number of steps per day	Average resting heart rate (beats per minute)
3600	96
3400	100
3100	99

Laura takes an average of 4000 steps per day.

Use the scatter diagram **with the extra data** to estimate Laura's average resting heart rate.

Give the units of your answer.

You **must** show your working, which should be on the diagram.

[5 marks]

Answer _____

b)

In total, the 16 employees had 70 days of sick leave last year.

Each day of sick leave costs the company £130

Laura thinks that increasing the wellbeing of the employees may reduce the number of days of sick leave.

She pays for gym membership for the 16 employees.

The cost for each employee is £15 per **month**.

Laura says,

“If the number of days of sick leave is reduced by 40% we will save over £750 per **year** after paying for the gym membership.”

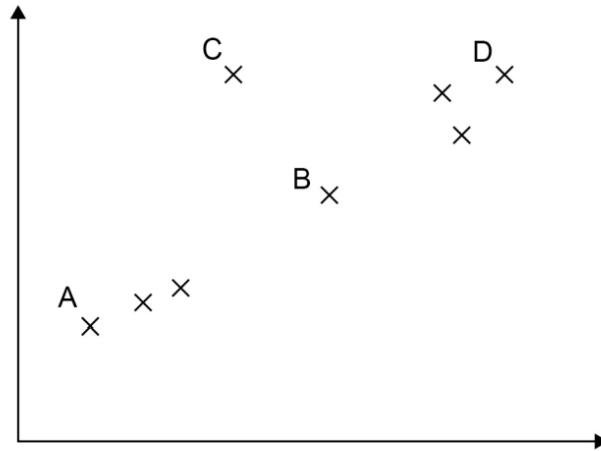
Is she correct?

You **must** show your working.

[7 marks]

9.

Here is a scatter diagram.



Four of the points are labelled.

Which one of these points is an outlier?

Circle your answer.

[1 mark]

A

B

C

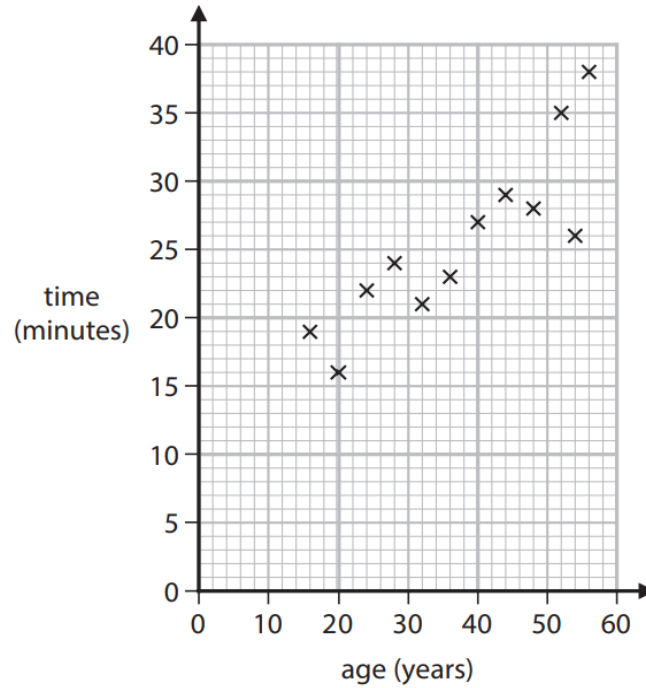
D

Calculator Questions

Edexcel

1.

The scatter diagram shows some information about 12 athletes who have run a race.



Here is the information for another athlete

- age 36, time 29 minutes.

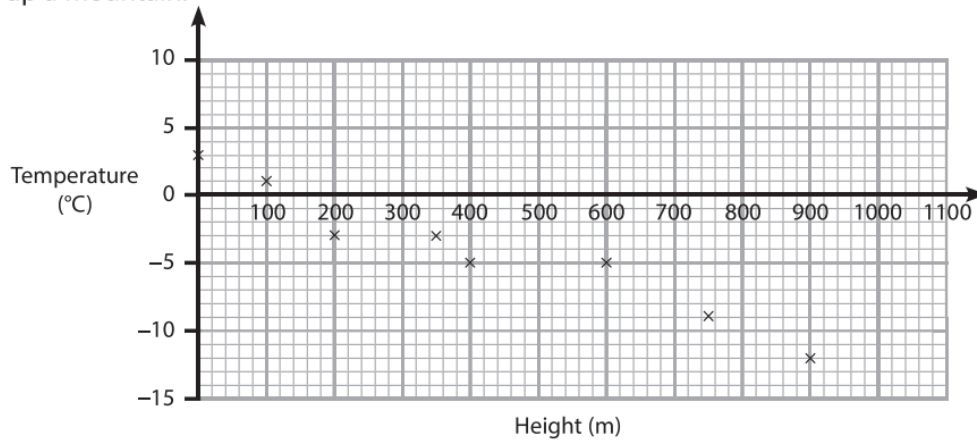
(a) Plot this information on the scatter diagram. (1)

(b) Draw the line of best fit on the scatter diagram. (1)

(c) Describe the relationship shown in this scatter diagram. (1)

2.

The scatter diagram gives information about the temperatures at 8 different heights up a mountain.



At a height of 1000m the temperature is -13°C .

(a) Plot this information on the scatter diagram.

(1)

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

(1)

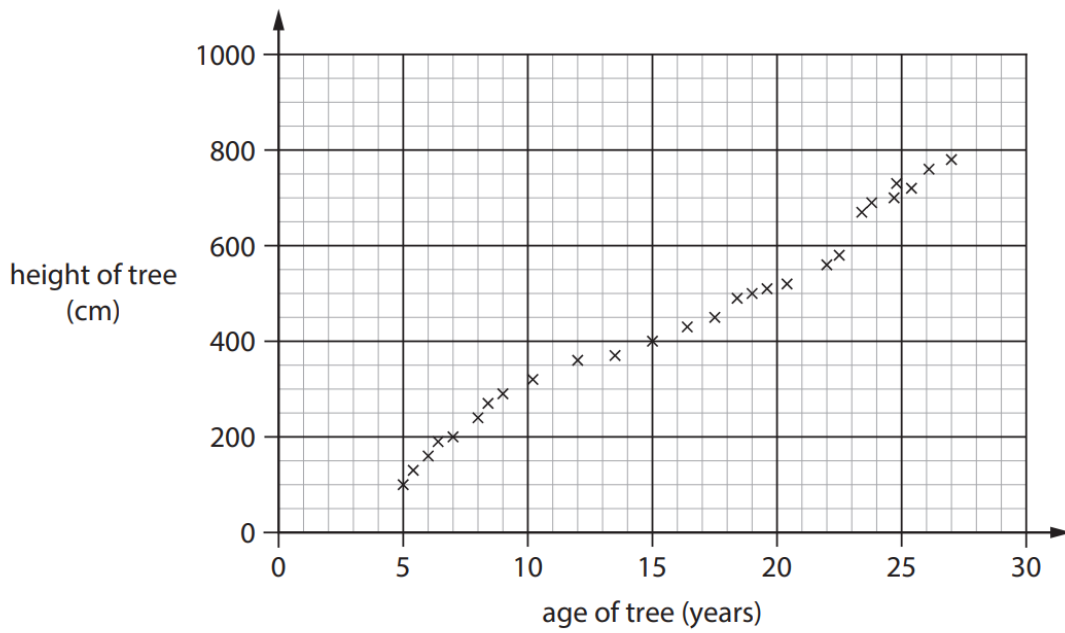
(c) Use the line of best fit to estimate the difference between the temperature at a height of 550m and at a height of 950m.

(2)

°C

3.

The scatter diagram shows information about the age and height of some trees.



(a) Describe the relationship shown in the diagram.

(1)

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

(1)

(c) Estimate the age of a tree with a height of 625 cm.

(1)

years

4.

Jana is writing a report about wages.

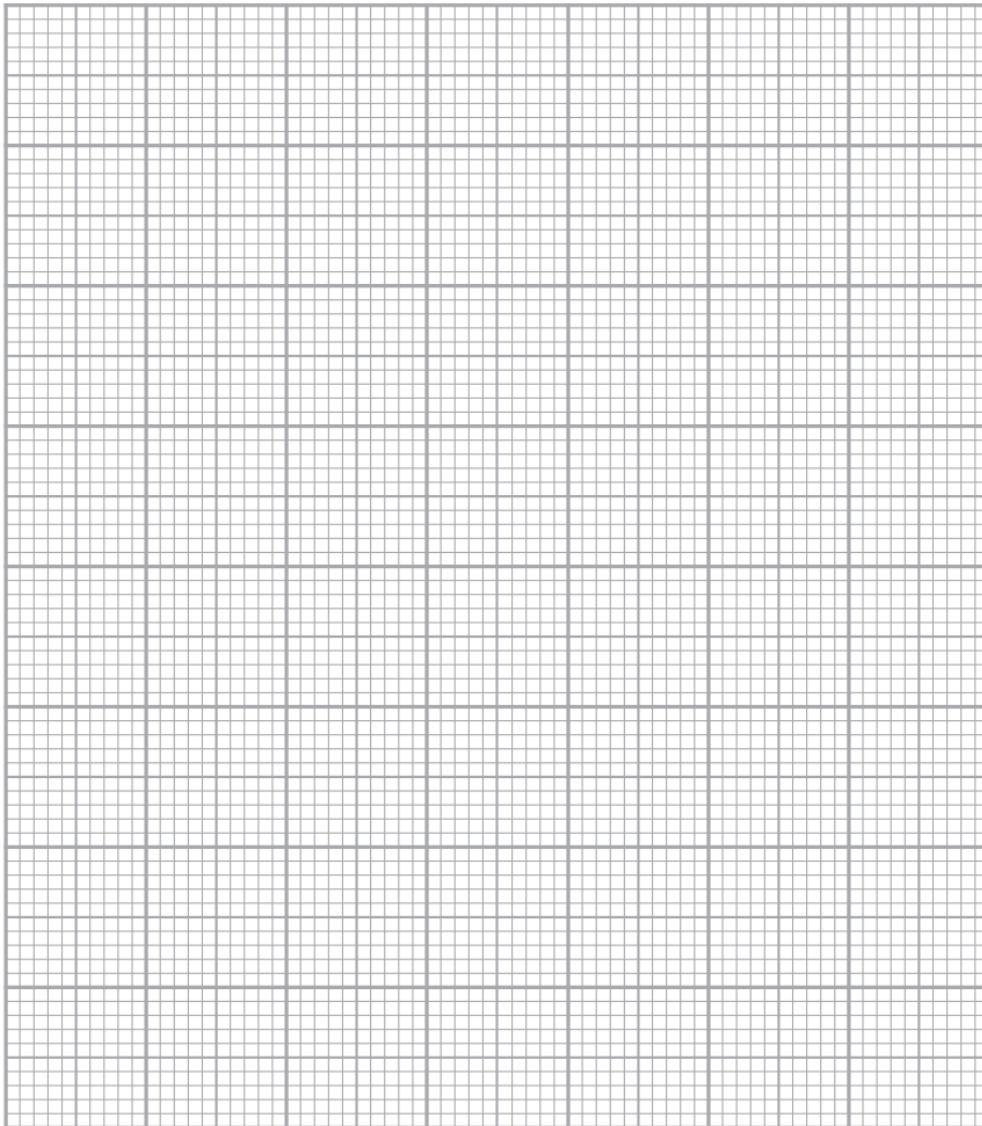
She has this information about the ages and weekly pay of eight men.

Age (years)	27	41	32	19	46	37	24	53
Weekly pay (£)	470	686	514	295	612	578	338	615

Jana wants to draw a diagram to see if there is a relationship between age and weekly pay for these eight men.

(a) Draw a suitable diagram for Jana.

(3)



(b) What type of correlation describes the relationship between age and weekly pay for these men?

(1)

Jana wants to compare the variation in weekly pay of men with the variation in weekly pay of women.

She finds the range of weekly pay for a sample of eight women is £437

(c) Write a comment comparing the variation in weekly pay for men and for women. Support your comment with a calculation.

(2)

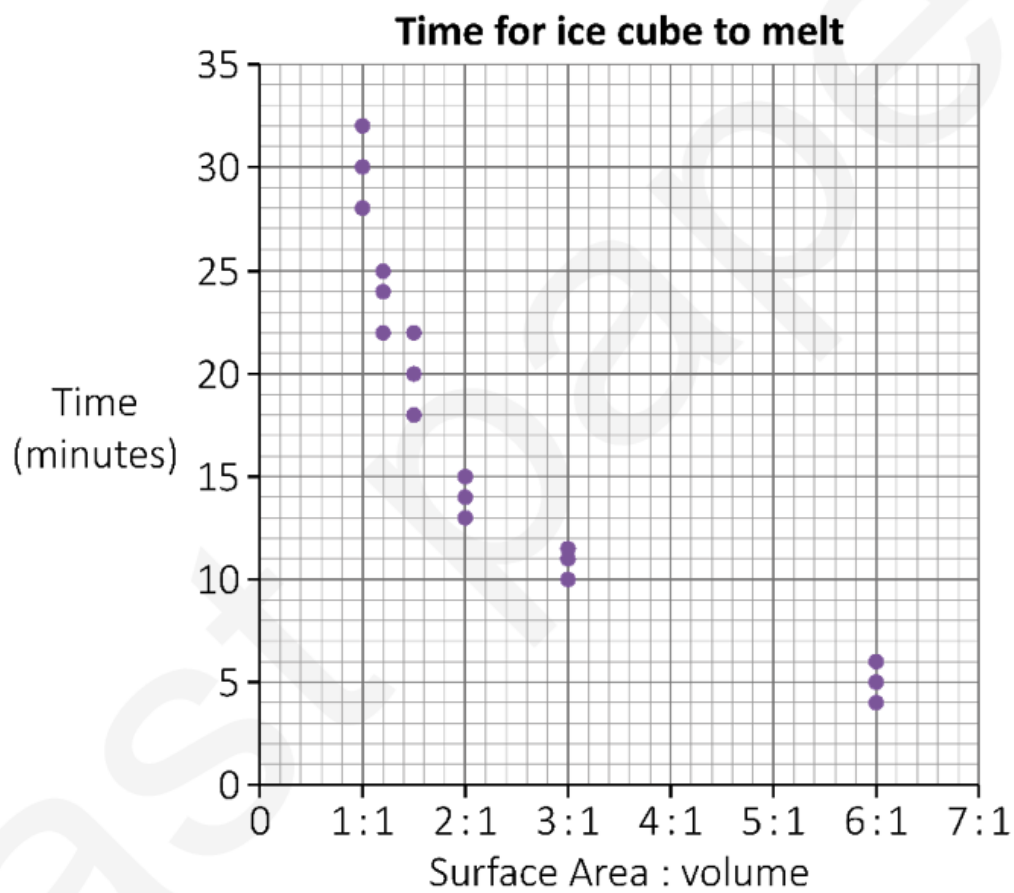
NCFE

5.

Tom is studying science at college.
He is learning about ice.

Tom does an experiment.
He shows that the ratio of an ice cube's surface area to its volume affects the time it takes for the ice cube to melt.

This scatter diagram shows his results:



Tom has another ice cube.
Each side is 2.5 cm long.

Estimate how long this ice cube will take to melt.

[4 marks]



Your answer:

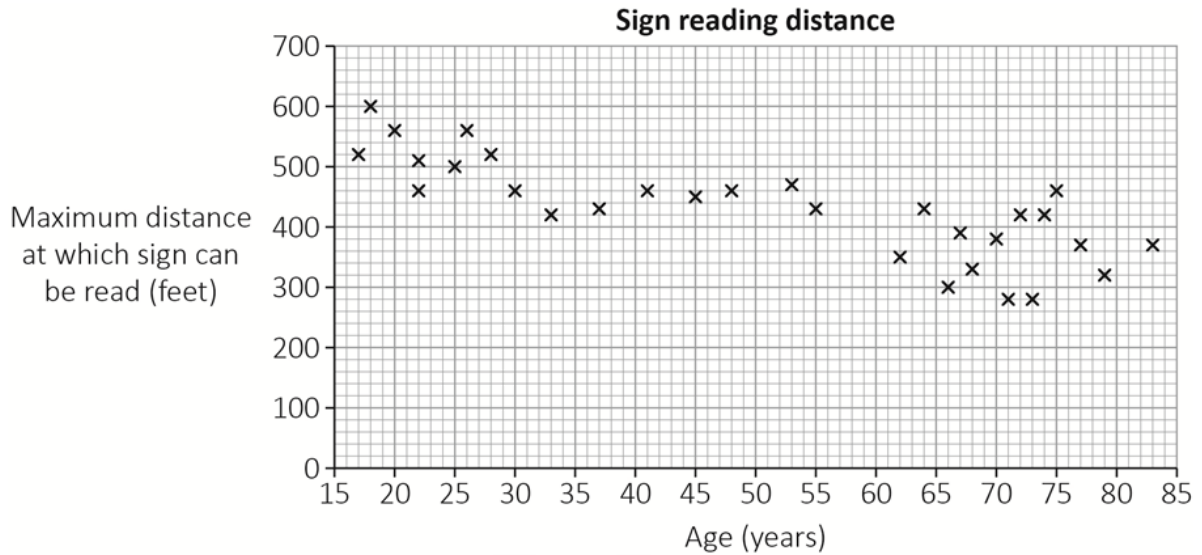
minutes

6.a)

Jed is 65 years old.

He drives a car but thinks his eyesight is not as good as it was.

The scatter diagram shows the relationship between the ages of drivers and the maximum distances at which they can read road signs.



What fraction **of the drivers over 65** can read a road sign at over 400 feet?

[3 marks]

Past

Your answer:

b)

Jed says,

“Using the scatter diagram, I predict that between the ages of 25 and 65 the maximum distance at which people can read a sign reduces by over 50 **metres**”

Is Jed’s prediction reasonable?

Use the scatter diagram in **3 (a)** to show how you decide.

Use the conversion: 1 metre = 3.28 feet

[5 marks]



Your answer:



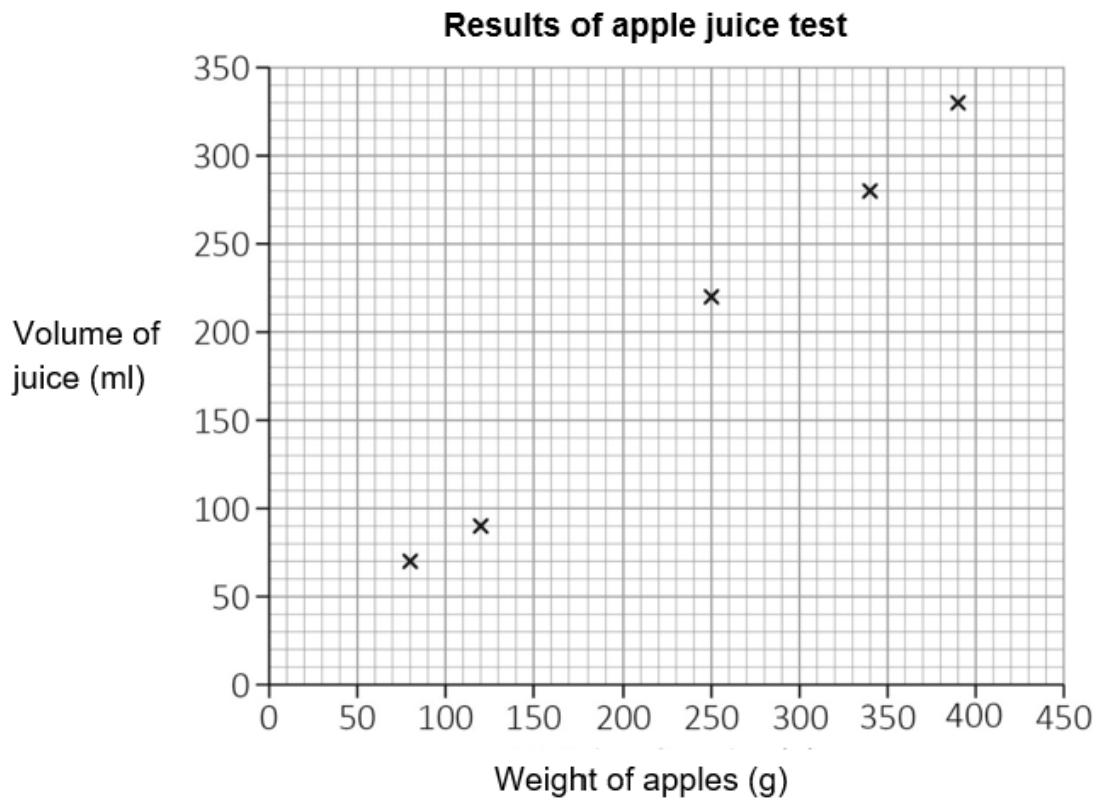
7.

Pete tests the SuperJuicer.

The manufacturer claims that 300 g of apples will produce $\frac{2}{5}$ of a pint of juice.

Pete tests this claim by juicing different weights of apples and measuring the amounts of juice they produce.

He uses his results to draw this scatter diagram:



Is the manufacturer's claim correct? Show how you decide.

Use the conversion: 1 pint = 568 ml

[3 marks]

Your answer:

8.

The Blitz-It juicer's information states that the weight of juice produced from oranges is around 30% of the weight of the fruit.

If Pete wants to produce 150 g of juice, what weight of oranges should he use?

[2 marks]

Your answer: g

9.

Emma also buys cars.

Bill wants to sell his old car.

The car is 3 years old and in good condition.

Emma uses a formula to work out the price that she will pay for Bill's car:

$$P = 12\,000 \times C \times (0.75)^T$$

Where:

P is the price she will pay (in £)

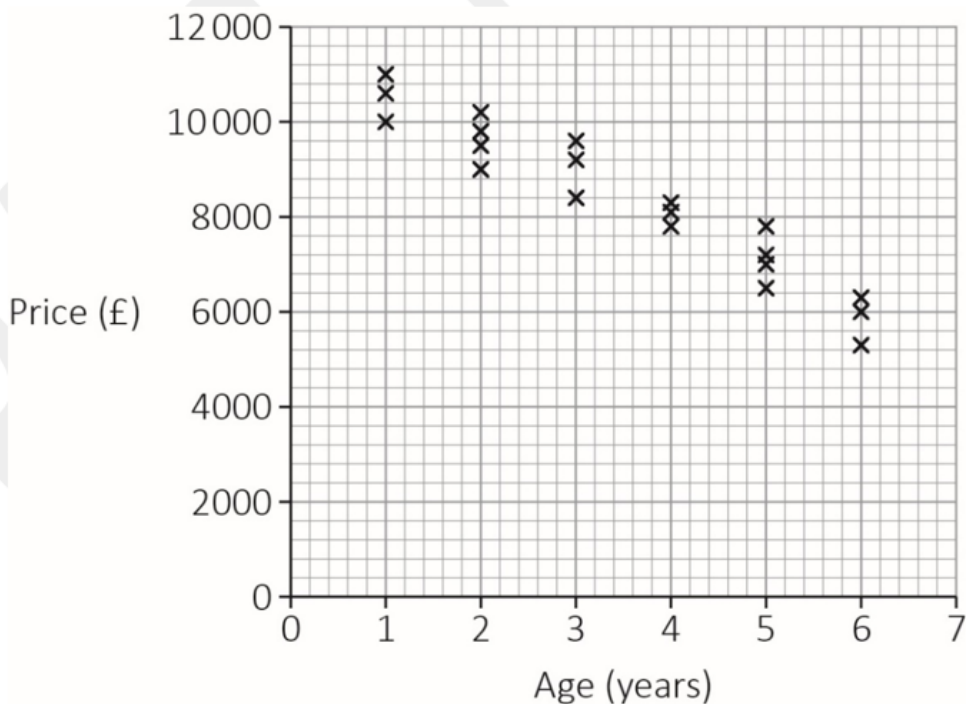
T is the age of the car (in years)

C is the condition of the used car, according to this table:

Condition	C
Good	0.9
Average	0.7
Poor	0.5

The scatter diagram below shows the prices paid online for the same model of car in good condition:

Car prices (£)



How much more would Bill expect to get if he sells his car online instead of selling to Emma?

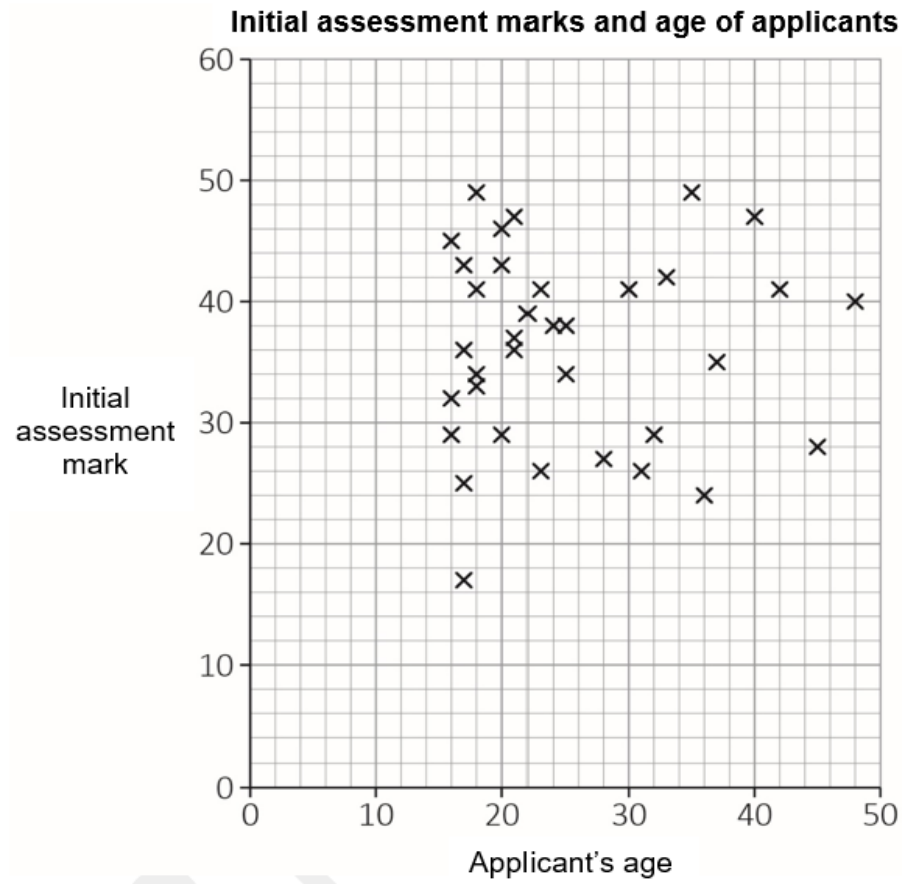
[4 marks]

<p>ST PAPER</p>	
Your answer:	£

10.

All applicants who attend the interview complete an initial assessment.

Mel has this scatter diagram about the results of the initial assessment:



What fraction of applicants over the age of 26 scored more than 40 marks?

[3 marks]

Your answer:

City & Guilds

11.

A café owner wants to know how many cold drinks she is likely to sell next week.

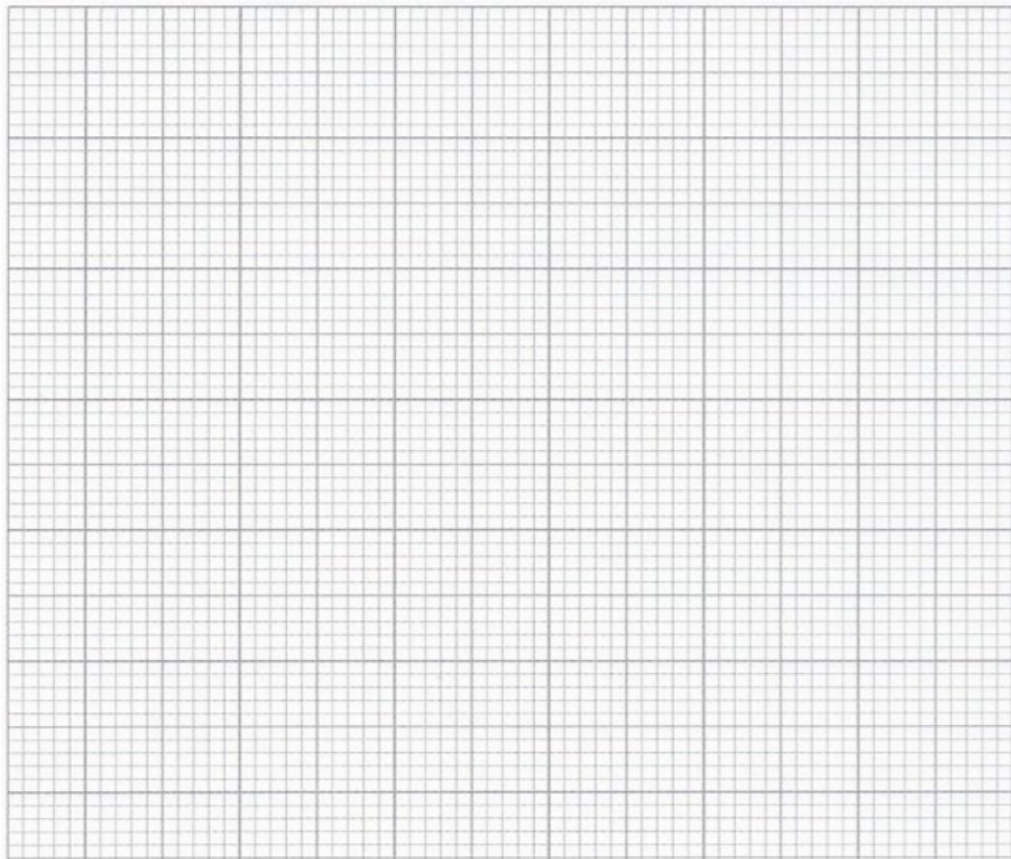
She makes a record of sales of drinks over the last two weeks:

Day	M	T	W	Th	F	S	M	T	W	Th	F	S
Temperature (°C) at midday	17	18	17	19	20	20	19	19	22	23	20	20
Number of cold drinks sold	24	26	25	30	32	28	27	29	35	40	30	34
Number of hot drinks sold	34	36	32	34	27	29	37	39	25	25	28	28

She wants to use this information to see if she can predict the number of **cold** drinks she is likely to sell based on the temperature forecast for a particular day.

Use the graph paper to show clearly the data she has collected in a way that will help her to do this.

Space for working



The weather forecast for next week says it will be 21°C on Monday.

What can you tell the café owner about how many cold drinks the café is likely to sell on Monday?
Show clearly on your graph paper how you found your answer.

Answer

(6 marks)

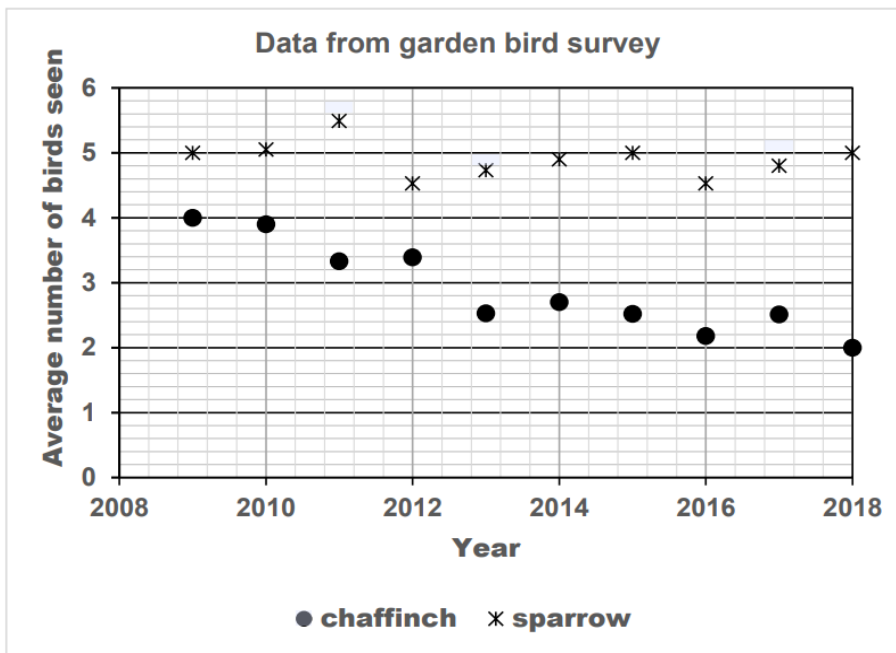
12.

A magazine article has this headline.

Garden birds in decline
Fewer birds seen in our gardens

An environmental organisation records information about bird populations.

The graph shows some data about two types of garden birds.



Is the magazine headline correct?

Show suitable calculations of percentage changes for the last ten years and draw trend lines on the graph to support your answer.

Explain your answer and make **two** comments.

Show all your working

Comment 1

Comment 2

(5 marks)

13.

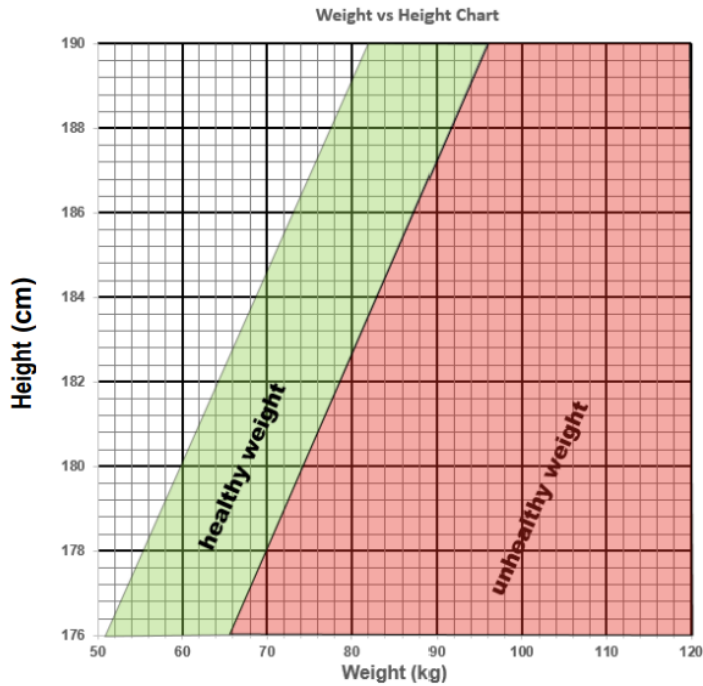
A man is 185cm tall and weighs 98kg. He wants to reach a healthy weight.

A doctor says he can lose 0.75kg a week if he follows a diet **and** exercises to burn 600 calories a week.

He plans his diet and decides to use Yoga exercise to burn 600 calories a week.

He will use one-hour Yoga classes that burn 200 calories. Each class costs £6.

He has £360 he can spend on Yoga classes



Does he have enough money to pay for the Yoga classes?

Explain your answer using figures.

Show your working

Does he have enough money? (tick one box) Yes No

Explanation

(5 marks)

14.

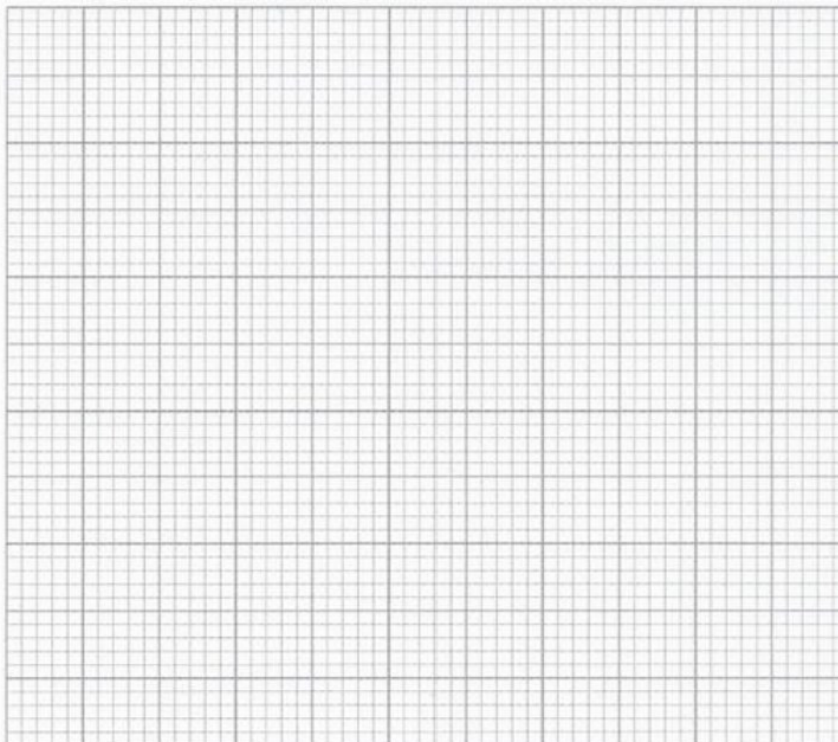
A vet nurse in a pet rescue centre records weights and ages of kittens brought to the centre.

Weights and ages of kittens brought to the centre				
weight (g)	age (days)		weight (g)	age (days)
600	50		660	50
340	28		720	56
480	42		420	28
360	20		180	14

One day the centre receives an abandoned kitten. It weighs 460g

The nurse needs to estimate the age of the kitten.

Draw a suitable graph and trend line.
 Estimate the age of the abandoned kitten.
 Show on the graph how you made the estimation.



Estimated age of rescued kitten weeks

(6 marks)

15.

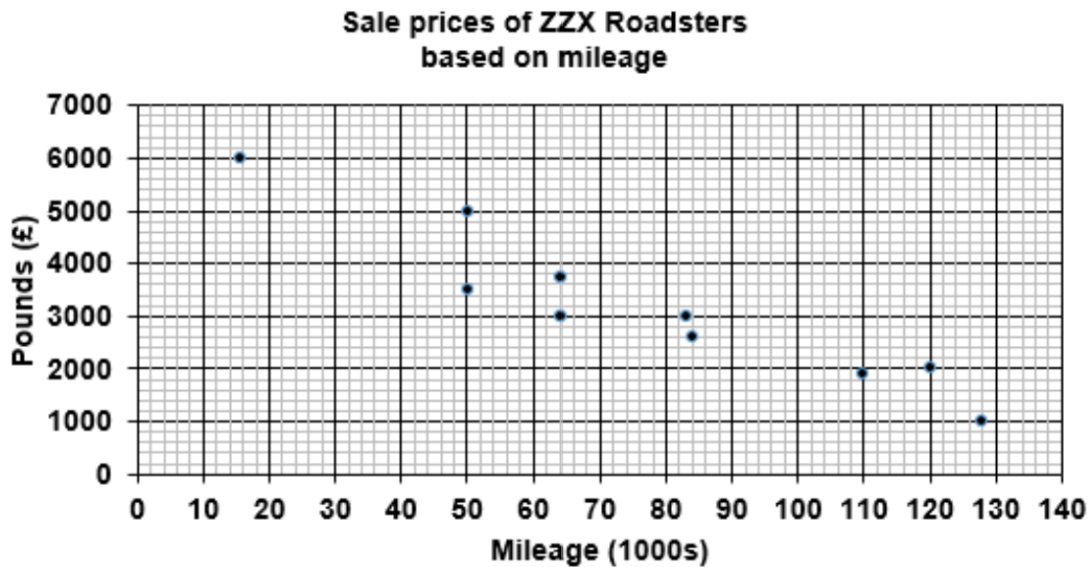
A garage sells used cars.

When a customer buys a car, the garage owner will offer an amount to pay for their old car.

A customer brings in a ZZX Roadster with a mileage of 70 000.

The garage owner estimates the value of this car based on the mileage.

He uses this website graphic to find this value.



He wants to make a first offer to the customer 30% below this value in order to make a profit when he resells it.

What amount should he offer the customer?

Explain your answer by drawing a trend line and marking the graph to show how you decided the amount.

Estimated value of the customer's car £

Show your working

First offer to customer £

(4 marks)

Highfield

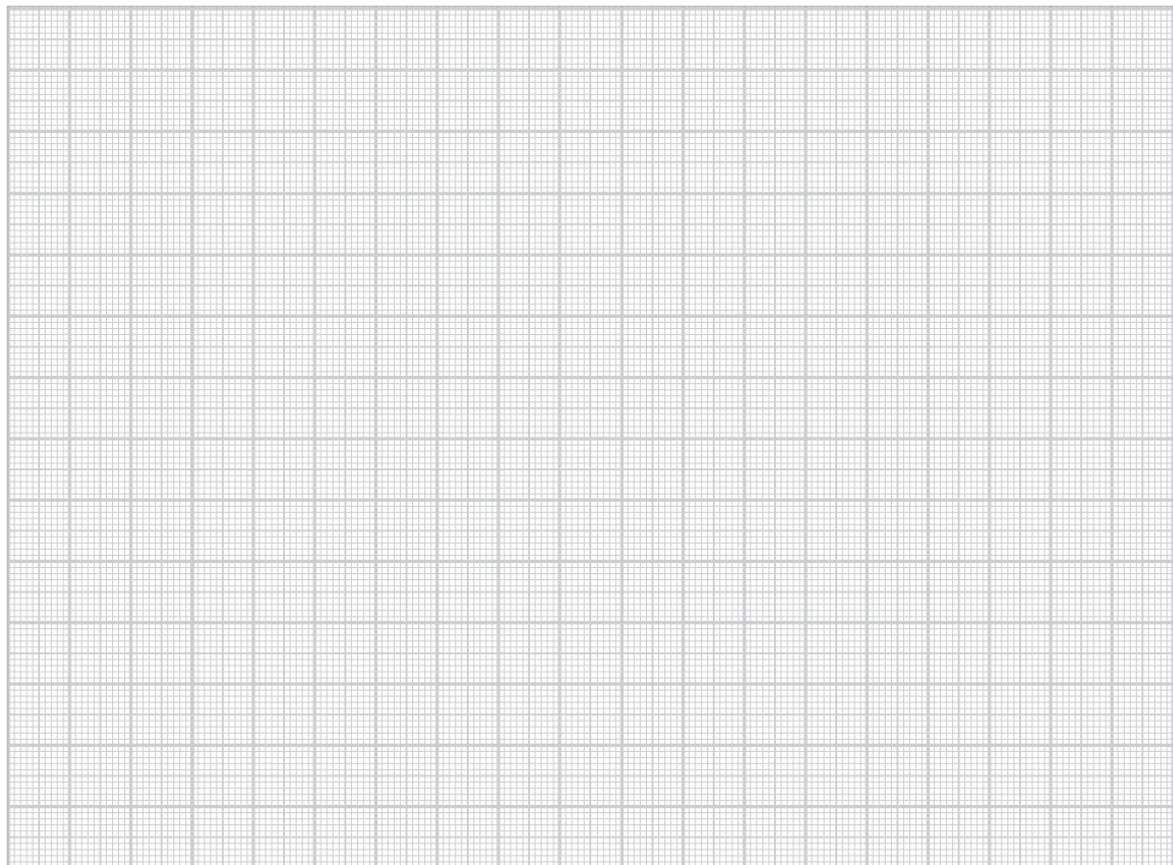
16.

This is a table of the heights and shoe sizes of some of the children at the nursery.

Name	Height (cm)	Shoe Size
Ben	98	11
Rosie	104	10
Holly	94	9
Eva	106	11
Samira	81	6
Tom	85	6
Meeku	92	9
Cameron	95	10
Rakeeb	91	9
Joseph	89	7

a. Draw a scatter diagram to represent this data.

(4 marks)



b. What type of correlation does this graph show?

Write your answer in the box below.

(1 mark)

Answer:

c. What is the mode shoe size of the children?

Write your answer in the box below.

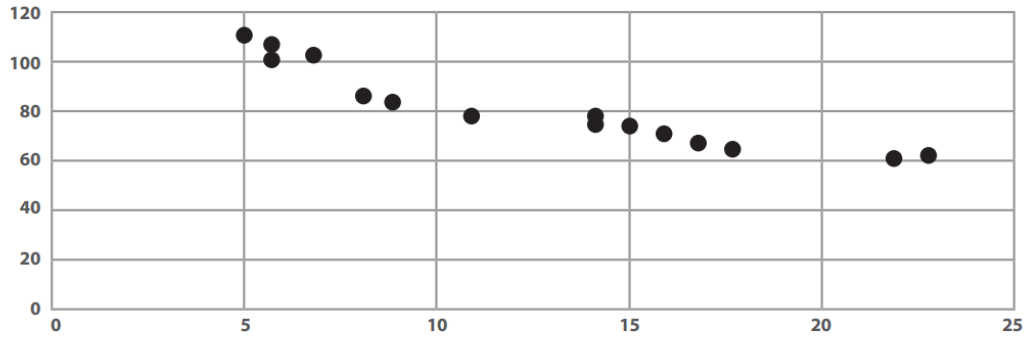
(1 mark)

Answer: _____

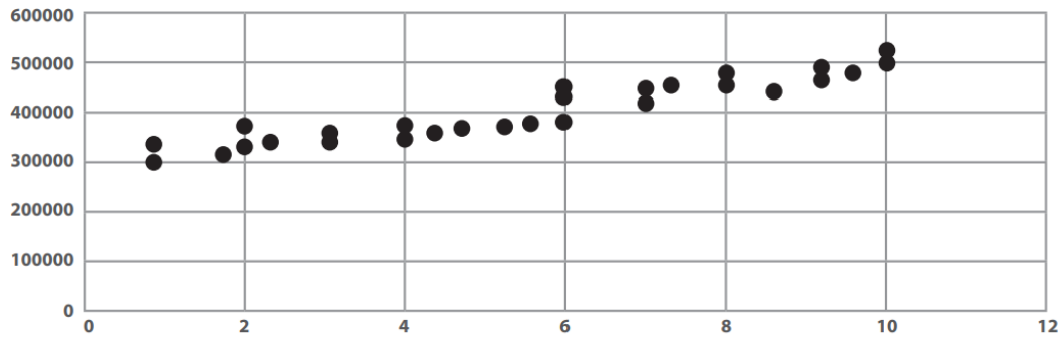
17.

Identify the types of correlation in the following scatter graphs.

Graph A



Graph B



Write the answers in the box below.

(2 marks)

Graph A: _____ Graph B: _____

Open Awards

18.

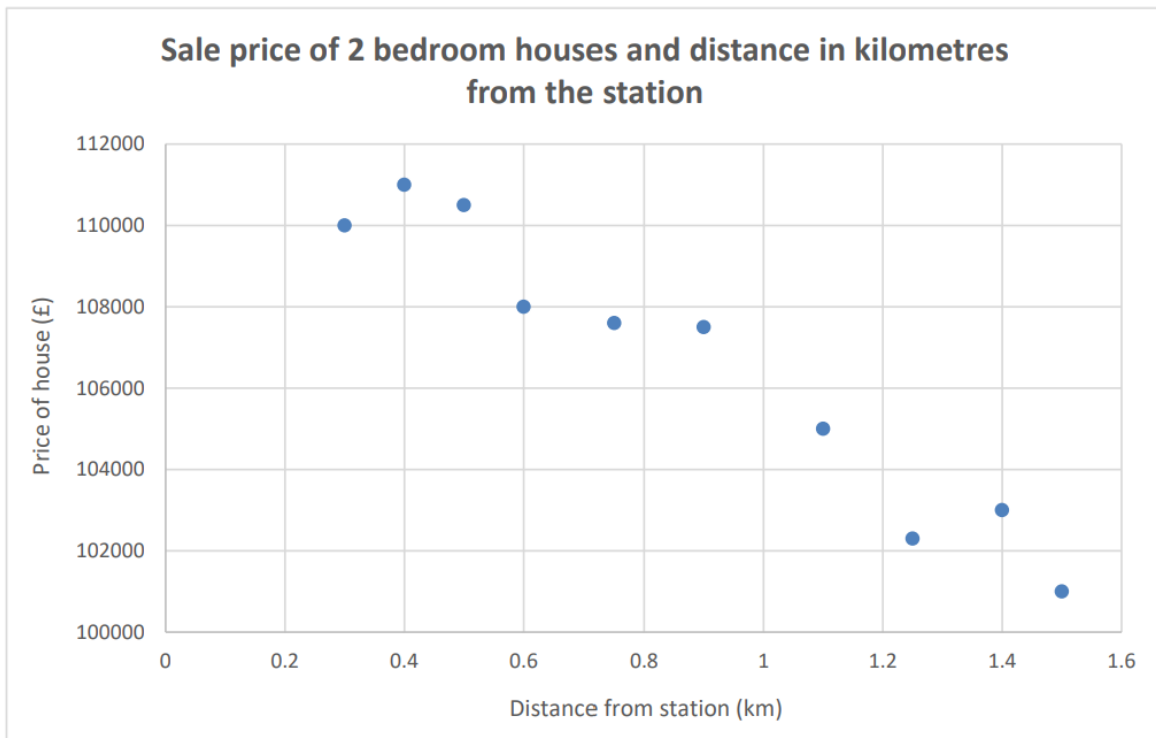
Khalid wants to buy a two-bedroom house no further than 0.6 miles from the station.

Khalid has saved a deposit of £4 875. He can afford a mortgage of 3.5 times his earnings which is £28 145 per annum.


The scatter graph shows information about the price and distance from the station of recent two-bedroom house sales in the area.

Can Khalid afford to buy a two-bedroom house within 0.6 miles of the station? Give a reason for your answer. (5 marks)

1 mile = 1.6 km



Show your calculations and/or workings out here:



Write your answer in this box, giving a reason for your answer.



AQA

19.

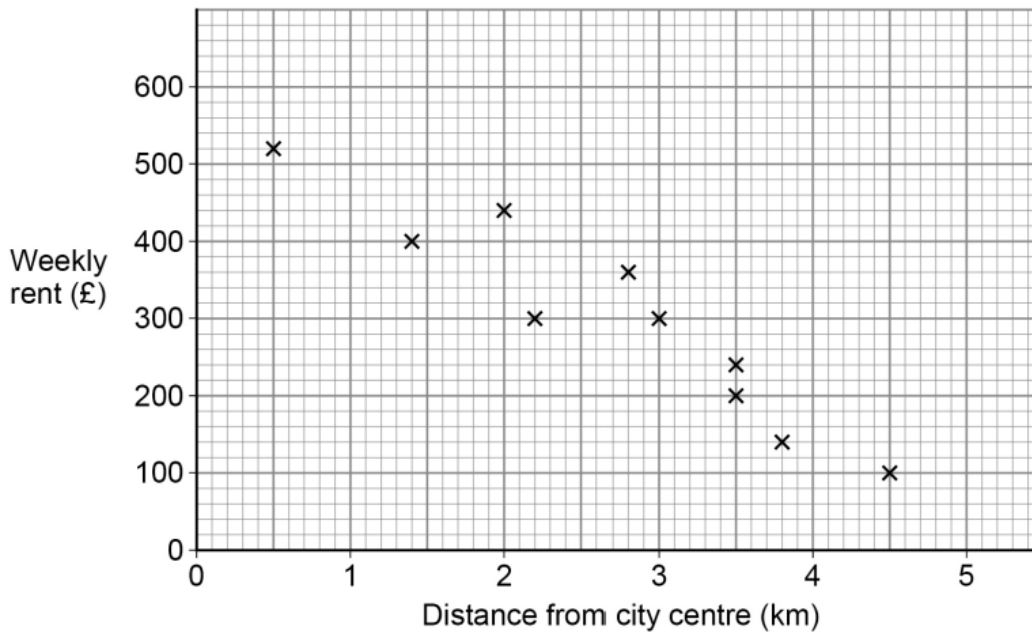
Pete wants to rent an apartment near Norwich city centre.

He records information about 10 apartments on a scatter diagram.

The diagram shows

the distance from the city centre in km

the weekly rent in £



The table shows extra data about two other apartments.

Distance from city centre (km)	Weekly rent (£)
2	250
3.2	180

Pete rents an apartment for £280 per week.

Use the scatter diagram **with the extra data** to

estimate the distance from the city centre to the apartment.

You **must** show your working, which should be on the diagram.

[4 marks]

Answer _____