

**Statistics GCSE****Paper 1**

Edexcel Foundation - 2026

Foundation Tier

Variant 3

1ST0/1F

**Instructions**

- Write all answers in the spaces provided.
- Answer all questions.
- You must show all your working.
- There may not be enough space to show all your working out.

**Information**

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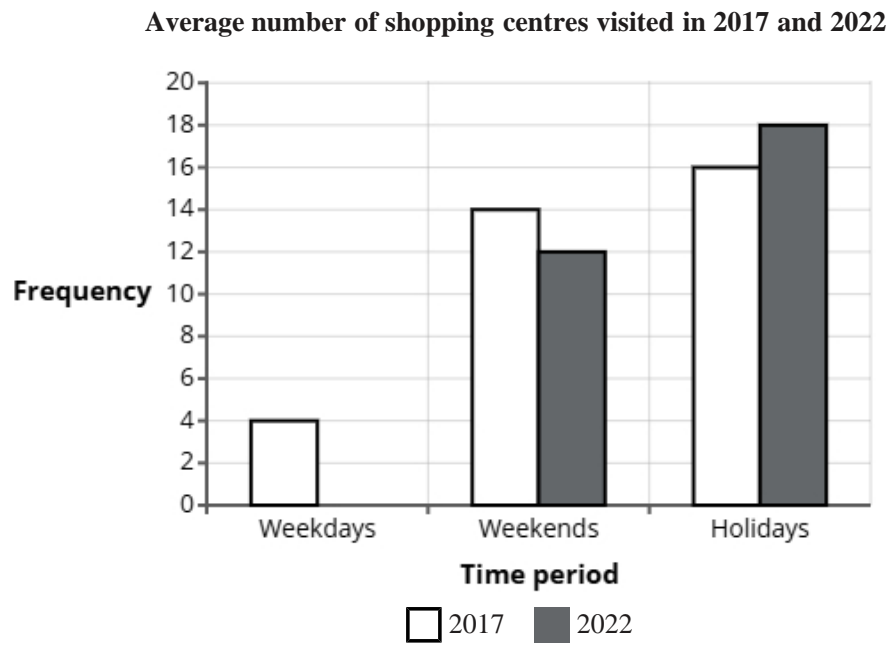
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**Advice**

- You can get support for all these questions at our website: [www.statsgcse.com](http://www.statsgcse.com)
- This paper and more are available on our site with questions that change subtly after each attempt.
- Good luck!

- 1 The comparative bar chart compares the average number of shopping centres visited at weekdays, weekends and holidays in 2017 and 2022.

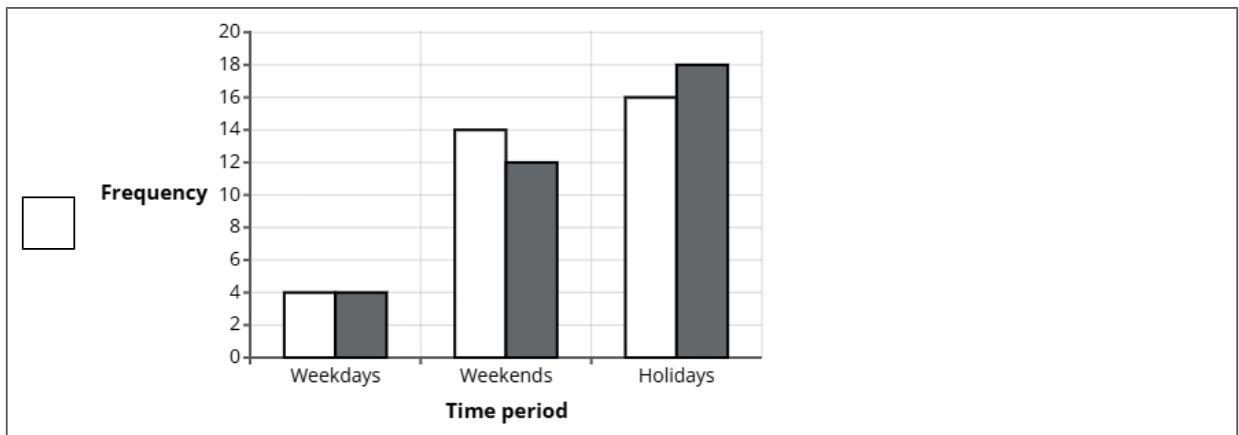
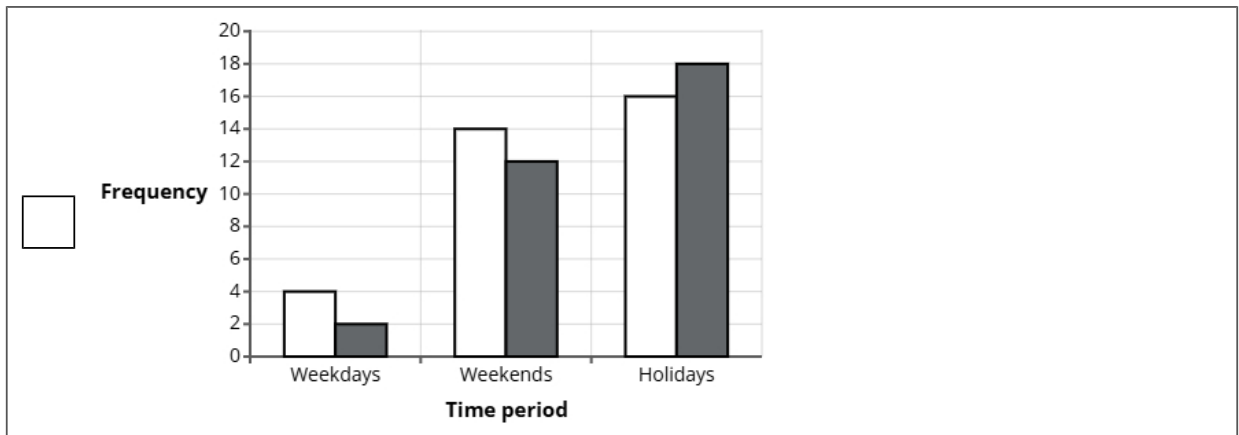
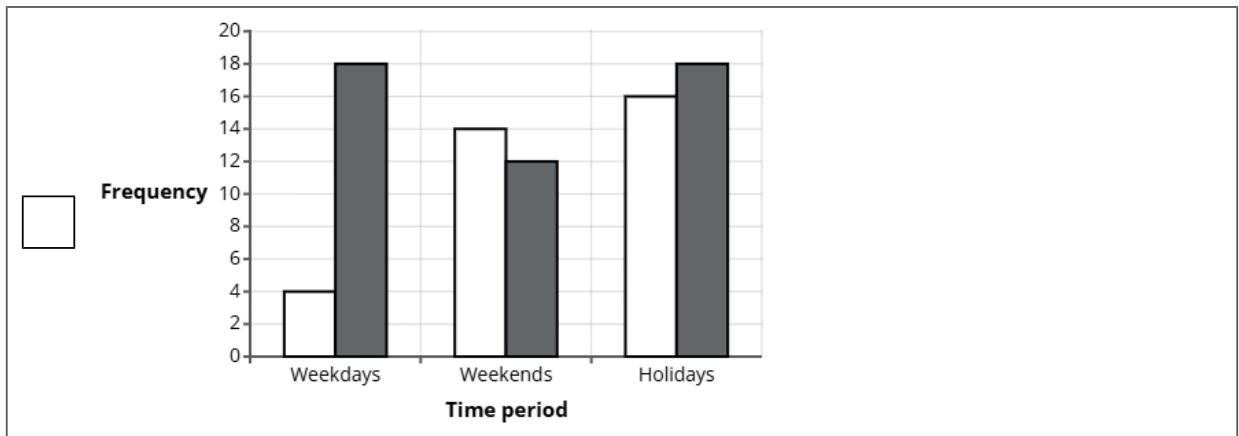
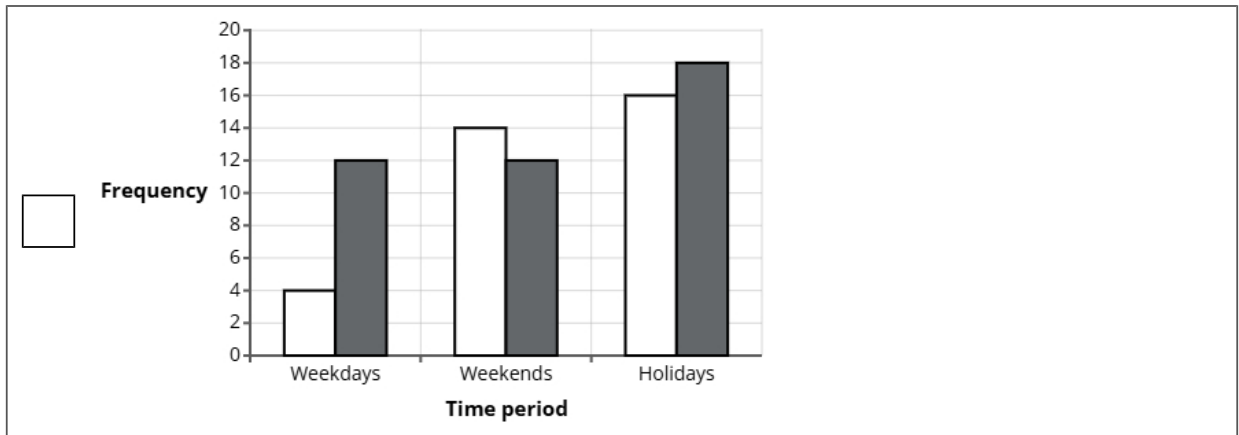


In 2022, people visited an average of 2 shopping centres on a weekday.

- (a) Complete the comparative bar chart for weekdays.

(1 mark)

Select the correct answer.



(b) Find how many more times people visited shopping centres in the holidays than at weekends in 2017.

(2 marks)

2017 is shown with an unshaded bar

(c) Compare the number of shopping centres visited at weekdays, weekends and holidays in 2017.

(2 marks)

Select the **two** correct statements (**two** statements are incorrect).

- People visited more shopping centres least on weekdays.
- People visited more shopping centres in the holidays than at weekends.
- People visited more shopping centres at weekends than in the holidays.
- People visited more shopping centres most on weekdays.

(d) The data displayed in the comparative bar chart is an example of quantitative data.

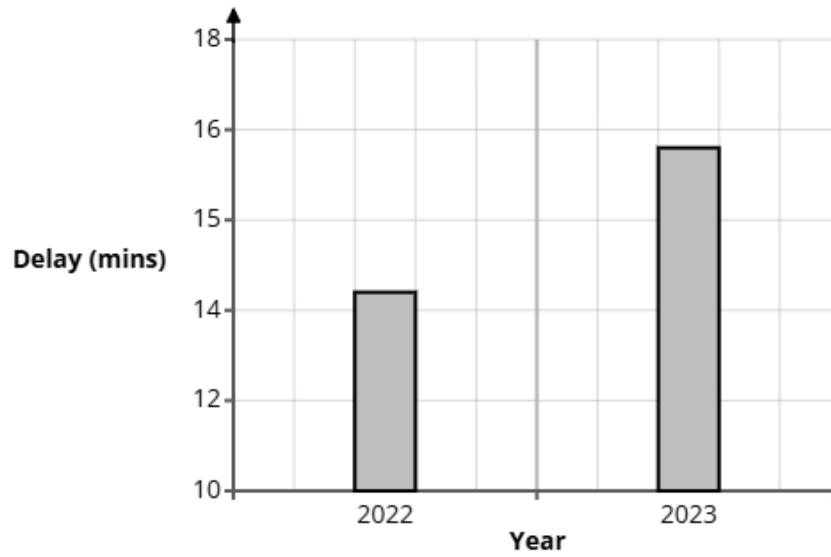
Explain what is meant by quantitative data.

(1 mark)

Select **one** box.

- Quantitative data is information collected through open-ended questions.
- Quantitative data is data expressed in numbers.
- Quantitative data is information based on emotions and opinions.
- Quantitative data is data that describes characteristics without using numbers.

- 2 A media outlet reviewed figures on public transport delays across a train line in 2022 and 2023.  
A bar chart is drawn from the information.



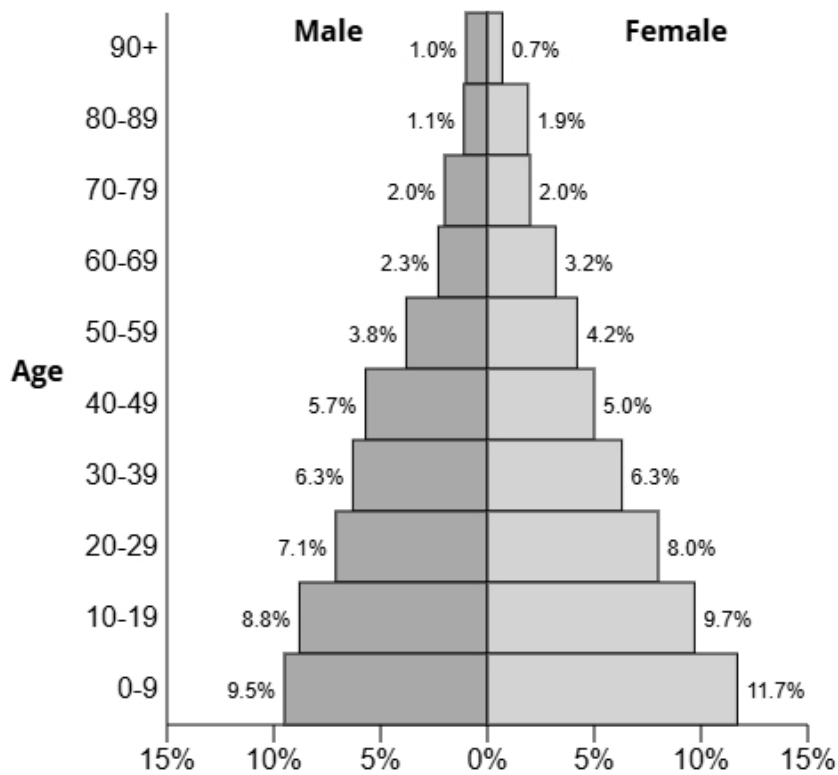
State **two** reasons why the bar chart could be misleading.

(2 marks)

Select **two** boxes.

- A pie chart would have been more suitable.
- The vertical axis scale does not go up in equal steps.
- The vertical axis on the graph does not begin at 0.
- The heights are wrong.

3 The population pyramid below shows the percentage of males and females in each age group for the town Thistlewick.



(a) Write down the percentage of females in the age group 10-19.

(1 mark)

Find 10-19 on the population pyramid and read off the number on the right-hand side (females).

\_\_\_\_\_ %

(b) Find the age group for males that has 7.1% of the population.

(1 mark)

Select **one** box.

50-59

20-29

40-49

30-39

(c) Find the age group that has 12.6% of the population.

(1 mark)

Select **one** box.

30-39

20-29

50-59

40-49

(d) Compare the percentage of the population aged 50-79 between males and females.

(1 mark)

Select **one** box.

There are more females.

They are both the same.

There are more males.

(e) Give a reason why the sum of all the percentages is 100.3% and not 100%.

(1 mark)

Select **one** box.

Some of the population may not have been counted.

The figures have been rounded.

The figures are wrong.

There are gaps in the ages.

4 A sports club is thinking about upgrading its facilities.

Jack is carrying out a survey to see what all club members think about the improvements.

Jack thinks that he should take a sample rather than a census.

(a) Jack has decided to use the register of members as a sampling frame.

State one problem Jack may have using the register of members as a sampling frame.

(1 mark)

Select **one** box.

The class registers would also include dates of birth.

The staff will not be included.

There will be too many names.

Bias.

(b) Jack is writing a plan for the investigation into club members' opinions on the upgrades to the facilities at the sports club.

Write down what Jack should include in the plan and explain why each of the things is appropriate.

You should include:

- + a sampling method
- + a question Jack should ask in the questionnaire
- + a statistical diagram to show the results of the survey.

(6 marks)

Number the **two** correct statements in the correct order (**two** statements are incorrect).

- Jack should use systematic sampling.
- This will ensure that the sample is representative of the whole membership.
- This will ensure that more students are asked.
- Jack should use full sampling.

Number the **two** correct statements in the correct order (**two** statements are incorrect).

A question could be:

- How satisfied are you with the current facilities?  
 Very Satisfied  Satisfied  Neutral  Unsatisfied  Very Unsatisfied
- The question is clear and unbiased, avoiding leading students to a particular answer.
- The question is open so will be easier and quicker to analyse.
- A question could be:  
Why do you think the facilities need to improve?

Number the **two** correct statements in the correct order (**two** statements are incorrect).

- This is because it shows frequencies and allows for visual comparisons.
- A tally chart can be used to display the data.
- This is because it can be used also to collect the data.
- A pictogram can be used to display the data.

5 The manager of a gym is reviewing the range of fitness classes offered.

The manager wants to find out what members think.

She plans to give a questionnaire to members who attend morning classes next week and ask them to return it at reception the following week.

(a) Describe the meaning of the term 'simple random sample'.

(1 mark)

Select **one** box.

Each individual in the population has an equal chance of being chosen.

The sample is created by selecting every  $n$ th individual from a list.

The same individuals can be chosen multiple times to ensure fairness.

The researcher selects individuals based on their judgment of who best represents the population.

(b) Assess the gym manager's plan to get the opinions of the members.

(3 marks)

Select **three** boxes.

No members will return the questionnaires.

The members are not being selected at random.

Not effective.

The members are only being asked on one day.

Questionnaires are a good way to collect opinions.

(c) Here is an open question that the gym manager is considering for the questionnaire.

What do you think about the fitness classes we offer?

Give one reason why this is not a good question.

(1 mark)

Select **one** box.

- It is an open question.
- The question is not relevant.
- There are too many ways to respond.
- There may be issues with privacy.

(d) Design a suitable closed question for the gym manager to use on her questionnaire so that she can decide how many different classes to run at the gym each week.

(2 marks)

Select the **two** correct statements (**two** statements are incorrect).

- Excellent
- Great
- Good
- Not bad
- 1 to 3 classes
- 4 to 6 classes
- 7 to 9 classes
- 10 or more classes
- How good are the fitness classes offered at the gym?
- How many different types of fitness classes should the gym offer each week?

- (e) When the gym manager has designed her questionnaire, she decides to pre-test it by using a pilot survey with a small sample of members.

Select **two** reasons why she should conduct a pilot survey.

(2 marks)

Select **two** boxes.

- A pilot survey will include more people.
- A pilot survey will test questions are working as intended.
- A pilot survey will give more accurate data.
- A pilot survey will give an idea of response rate.

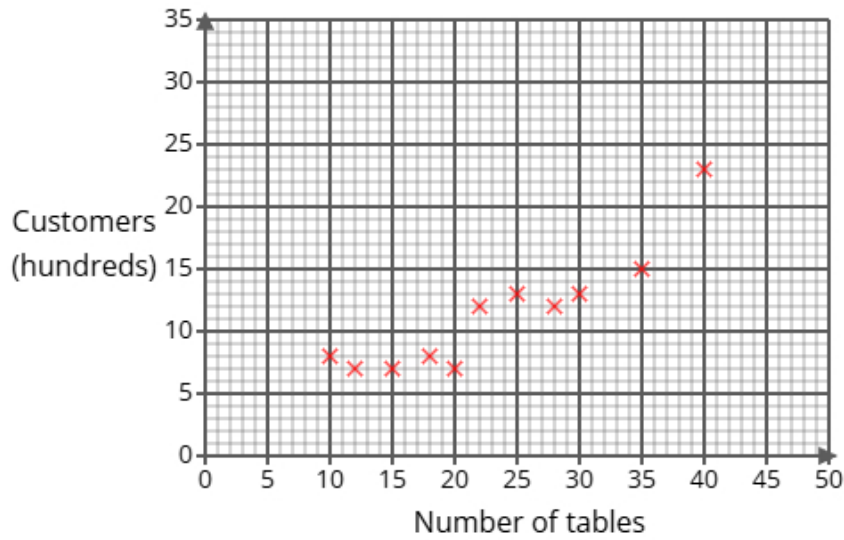
- 6 A sports coach wants to know how much time players spend training outside organised sessions each week. She plans to ask 10 players from the team to record the number of hours they train in a week. Each player will write down their weekly training time. Describe one problem the sports coach might face in the statistical enquiry process due to non-response or unexpected results, and explain how she could address this issue.

(2 marks)

Select the **two** correct statements (**two** statements are incorrect).

- To address this she could give them a defined list of training activities.
- Not all players may agree on what counts as training.
- The players could lie.
- To address this she could ask more players.

- 7 Noah collected data on 11 restaurants, recording their number of tables and the average number of customers they serve per week (in hundreds). He represented his findings in the scatter diagram below.



- (a) One of the 11 restaurants has 28 tables.

For this restaurant, write down the average number of customers they serve per week.

(1 mark)

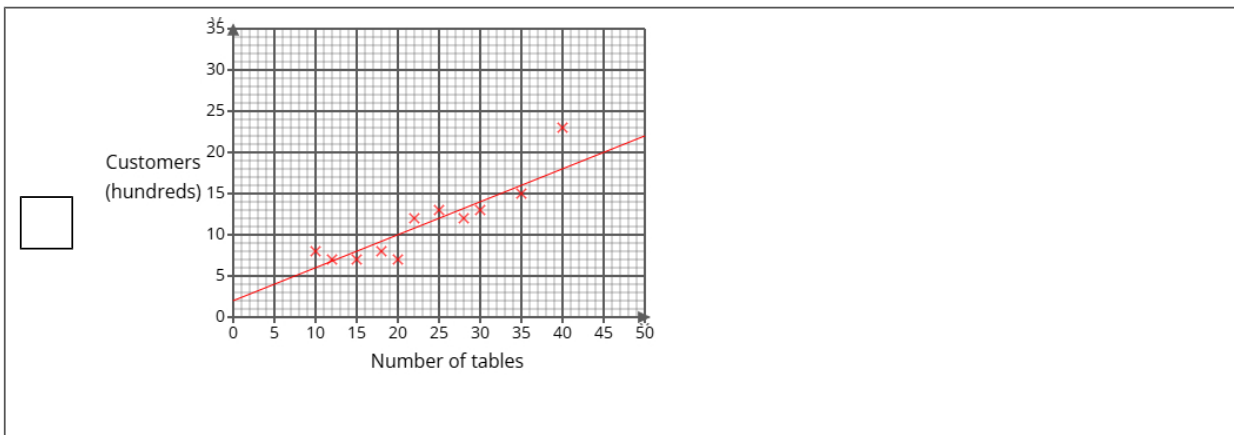
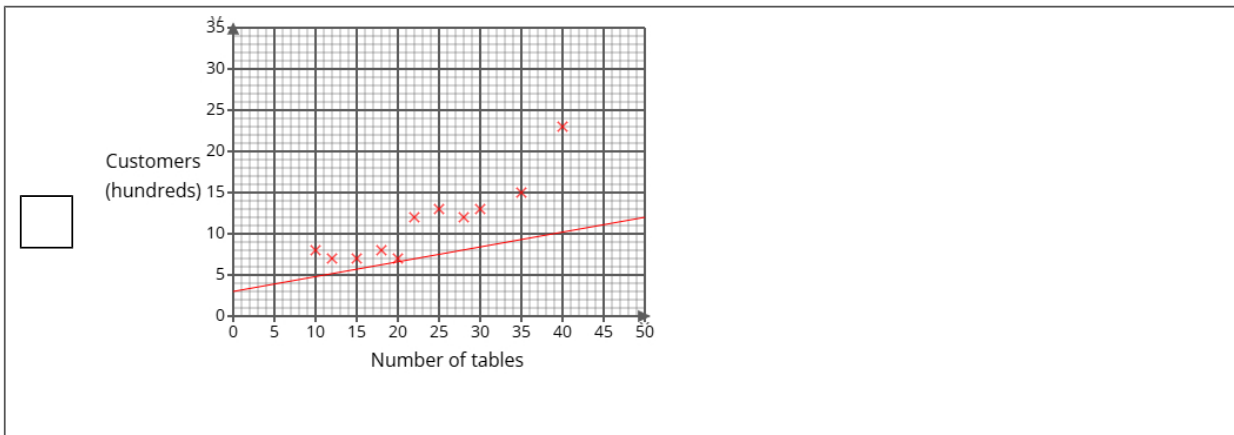
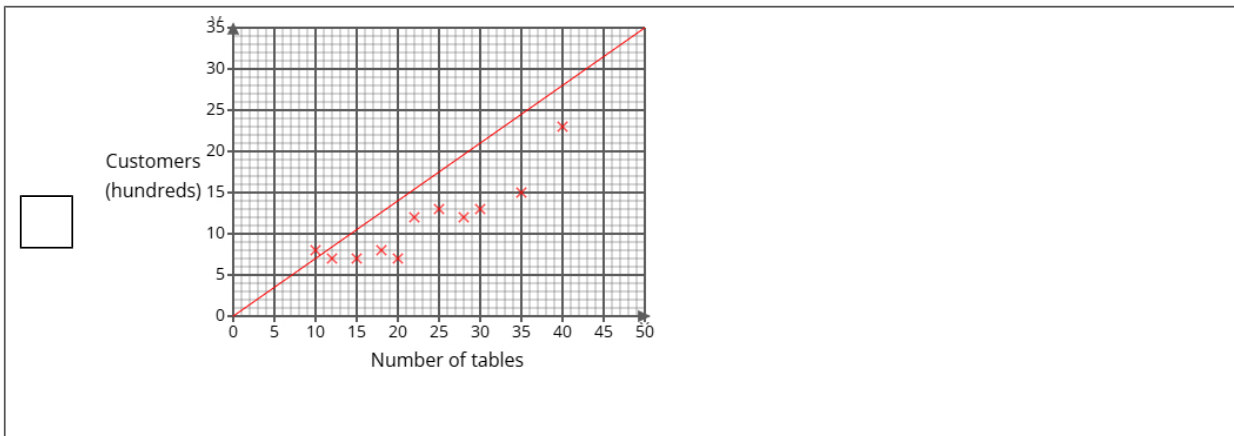
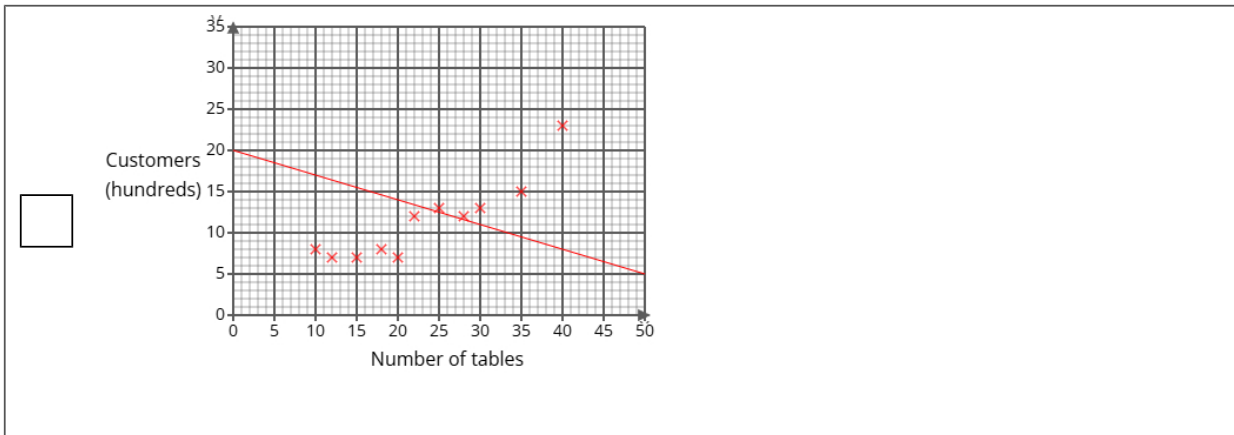
Find the cross on the scatter graph that is at 28 on the x-axis (the bottom axis), then read off the value from the y-axis (the side axis).

\_\_\_\_\_ customers

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

(1 mark)

Select the correct answer.



(c) Describe and interpret the type of correlation shown by the scatter diagram.

(3 marks)

Number the **two** correct statements in the correct order (**three** statements are incorrect).

- The correlation is negative and
- There is no correlation but it is
- strong
- The correlation is positive and
- weak

Select **one** box.

- A restaurant that has lots of tables will have a high number of customers.
- A restaurant that has lots of tables will have a low number of customers.
- As the tables increases the number of customers increases.
- As the tables increases the number of customers decreases.

(d) A new restaurant will be opening soon with 75 tables.

Noah is planning on using the line of best fit on the scatter diagram to predict the average number of customers they serve per week.

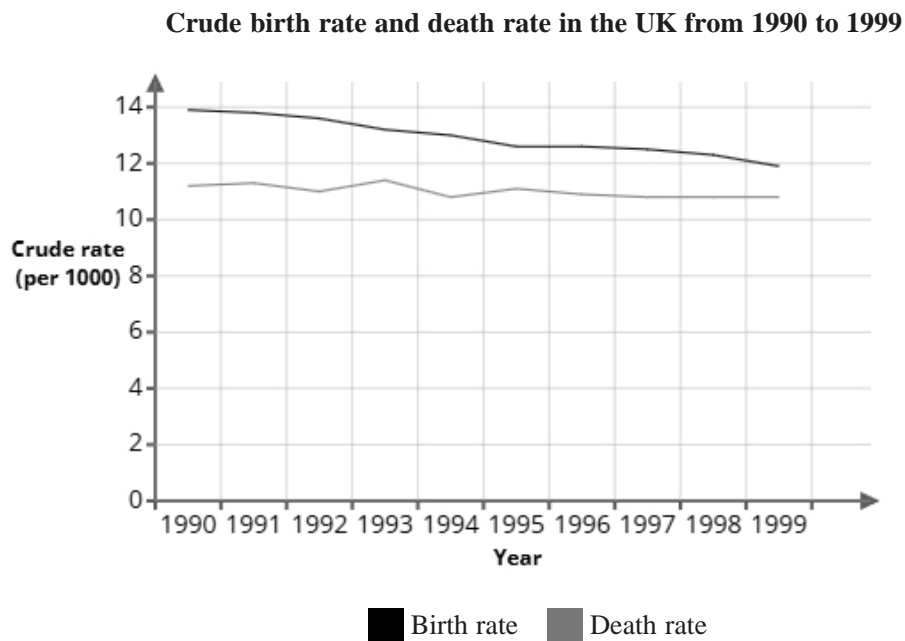
Explain whether or not it is appropriate to use the line of best fit for this prediction.

(2 marks)

Number the **two** correct statements in the correct order (**two** statements are incorrect).

- because the point is outside the range of the data.
- This is appropriate
- This is not appropriate
- because the point is inside the range of the data.

8 The graph shows the crude birth rate and death rate in the UK from 1990 to 1999



Sophia uses the information in the graph to conclude:

"The total population in the UK has increased from 1990 to 1999"

(a) Explain how the information in this graph supports Sophia's conclusion.

(1 mark)

Select **one** box.

- In 1990, the birth rate is roughly 3 bigger than the death rate.
- The graph shows that the UK is a large country.
- The crude birth rate is higher than the crude death rate.
- The crude death rate is higher than the crude birth rate.

(b) Give a reason why Sophia's conclusion might **not** be correct.

(1 mark)

Select **one** box.

- Sophia's conclusion does not take into account the average age of the population.
- Sophia's conclusion does not take into account emigration.
- Sophia's conclusion does not take into account where in the UK these births happened.
- The data in the graph may be inaccurate.

(c) In 2000, the population of the UK was 58 894 355.

There were 679 324 recorded births.

Using the formula below, calculate the crude birth rate in 2000.

Give your answer correct to 1 decimal place.

$$\text{crude birth rate} = \frac{\text{number of births} \times 1000}{\text{total population}}$$

(2 marks)

Substitute each of the values into the crude birth rate formula.

9 Emma investigates the monthly electricity bills (in pounds) of 250 households.

The charges range from £38 to £112.

Emma considers using one of the two possible grouped frequency tables for the results, Table A or Table B, shown below.

**Table A**

Charge (£ p)	Frequency
$0 < p \leq 30$	0
$30 < p \leq 60$	45
$60 < p \leq 90$	169
$90 < p \leq 120$	36
$120 < p \leq 150$	0

**Table B**

Charge (£ p)	Frequency
$30 < p \leq 50$	18
$50 < p \leq 70$	79
$70 < p \leq 90$	116
$90 < p \leq 110$	33
$110 < p \leq 130$	4

(a) Give **two** advantages of using grouped data rather than raw data.

(2 marks)

Select **two** boxes.

- Grouped data helps avoid using averages.
- Grouped data is easier to read.
- Grouped data provides a more accurate reflection of trends.
- Grouped data can help to spot patterns in the data.
- Grouped data eliminates the need to use any statistical methods.

(b) Give **one** disadvantage of using grouped data rather than raw data.

(1 mark)

Select **one** box.

- Grouped data cannot be used for statistical tests.
- Grouped data does not show the maximum and minimum values.
- Grouped data cannot be used to identify patterns.
- Grouped data cannot be drawn on a graph.

(c) Emma feels that Table B gives more detail than Table A about the results.

Assess the appropriateness of Emma's claim.

(2 marks)

Select the **three** correct statements (**three** statements are incorrect).

- Emma's claim is justified.
- In Table A, there are no households in two of the groups, so these groups are not needed.
- In Table A, there are no households in two of the groups, so there is a much better spread of data.
- in Table B, each group has a smaller class width, showing more detail.
- Emma's claim is not justified.
- in Table B, each group has a smaller class width, so detail is lost.

(d) Emma wants to work out the average monthly electricity bills of the 250 households.

She decides to use Table B.

Calculate the average monthly electricity bills of the 250 households, giving your answer to 1 decimal place.

(3 marks)

Add midpoint and  $fp$  columns onto the table.

Then find the sums of the  $f$  and  $fp$ .

Find the mean by  $\frac{\sum fp}{\sum f}$

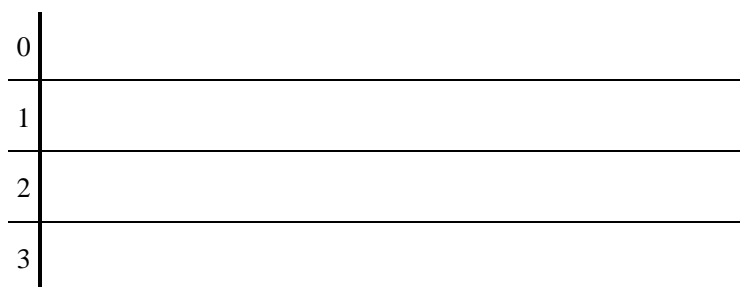
\_\_\_\_\_ pounds

**10** 23 male volunteers were asked to toss a ball into a basket 40 times and the number of successful hits was measured.

Here are the results.

16	6	5	16	22	33	9	35
17	37	22	37	7	20	7	5
3	19	13	10	2	5	5	

(a) Complete the stem and leaf diagram for the data.



**Key:** 1|0 = 10

(2 marks)

Select the correct answer.

	0	2 3 5 5 5 5 6 7 7 9
	1	0 2 2
<input type="checkbox"/>	2	0 3 6 6 7 9
	3	3 5 7 7

	0	0 3 6 6 7 9
	1	2 3 5 5 5 5 6 7 7 9
<input type="checkbox"/>	2	0 2 2
	3	3 5 7 7

	0	2 3 5 5 5 5 6 7 7 9
	1	0 3 6 6 7 9
<input type="checkbox"/>	2	0 2 2
	3	3 5 7 7

	0	2 3 5 5 5 5 6 7 7 9
	1	0 3 6 6 7 9
<input type="checkbox"/>	2	3 5 7 7
	3	0 2 2

(b) Work out the interquartile range from the data.

(2 marks)

Find the lower quartile using  $\frac{1}{4}(n + 1)^{\text{th}}$

Find the upper quartile using  $\frac{3}{4}(n + 1)^{\text{th}}$

Find the interquartile range

**IQR = upper quartile – lower quartile**

(c) A group of 23 female volunteers were also measured.

The results from the female volunteers had a median of 16 and an interquartile range of 15.

Oliver thinks that these results show that females are better at tossing a ball into a basket than males.

State whether you agree with Oliver and give reasons why.

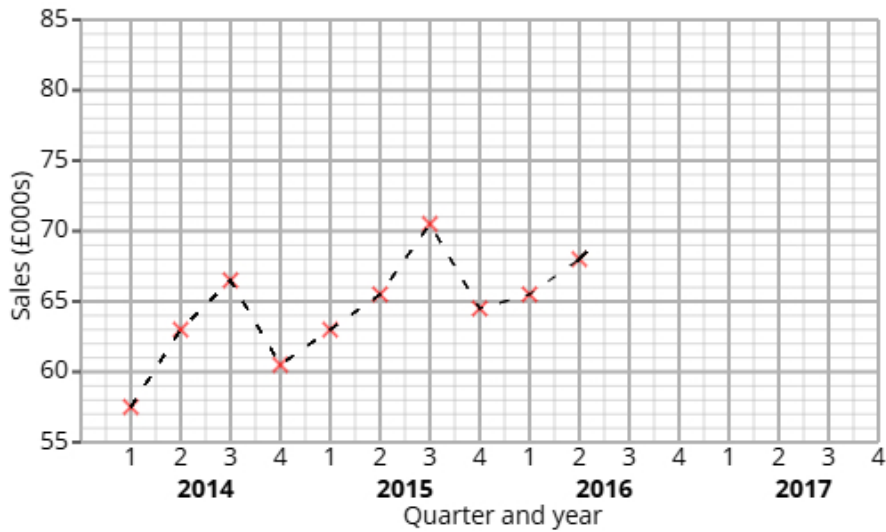
(3 marks)

Median for male volunteers = \_\_\_\_\_

Select the **two** correct statements (**two** statements are incorrect).

- The median for the females is higher than the median of the males.
- No, Oliver's conclusion is supported by the data.
- Yes, Oliver's conclusion is supported by the data.
- The median for the males is higher than the median of the females.

11 The time series graph shows information about the sales at a clothes shop from 2014 to 2016.



Ava calculates the 4-point moving averages from the time series graph, which are shown below.

62      63      64      65      66      67      67

(a) Identify and interpret in context one example of seasonality displayed in the time series graph.

(2 marks)

Number the **two** correct statements in the correct order (**two** statements are incorrect).

- which shows that less people buy clothes in the summer.
- The greatest values are in Q3
- which shows that more people buy clothes in the summer.
- The lowest values are in Q2

(b) Explain why a 4-point moving average is appropriate.

(1 mark)

Select **one** box.

- The pattern in the data repeats every four quarters.
- It shows correlation.
- 4-points is more detailed than annual data.
- It shows skew within the data.

**12** A fair 4-sided spinner is numbered 1, 2, 3, 4.

A fair 3-sided spinner is numbered 1, 2, 3.

The spinners are used to play a game. Both spinners are spun and the total score is recorded.

		3-sided spinner		
		1	2	3
4-sided spinner	1	2	3	
	2	3		
	3			
	4			

The game is won when the total is at least 5.

Kai plays the game once.

**(a)** Complete the sample space diagram.

(2 marks)

Select the correct answer.

3-sided spinner

	<b>1</b>	<b>2</b>	<b>3</b>
<b>1</b>	2	3	5
<b>2</b>	3	5	6
<b>3</b>	5	6	7
<b>4</b>	6	7	8

4-sided spinner

3-sided spinner

	<b>1</b>	<b>2</b>	<b>3</b>
<b>1</b>	2	3	4
<b>2</b>	3	4	5
<b>3</b>	4	5	6
<b>4</b>	5	6	7

4-sided spinner

3-sided spinner

	<b>1</b>	<b>2</b>	<b>3</b>
<b>1</b>	2	3	3
<b>2</b>	3	4	6
<b>3</b>	3	6	9
<b>4</b>	4	8	12

4-sided spinner

(b) Find the probability that Kai wins the game.

(2 marks)

Find all the numbers in the table that are 5 or larger

Put this number as the numerator and total amount of numbers as the denominator

$$\text{probability} = \frac{\text{5 or larger}}{\text{total outcomes}}$$

- 13** Sara organises two painting classes, Class Red and Class Blue, to help people learn watercolour techniques. She wants to compare the two classes to see which improves skills more.

The table shows number of participants who passed or failed the painting challenge.

	Passed	Failed	Total
Class Red	24	8	32
Class Blue	35	25	60

- (i) Find the relative risk of failing the painting challenge having been in Class Red compared to Class Blue.  
(ii) Give an interpretation of your answer to part (i).

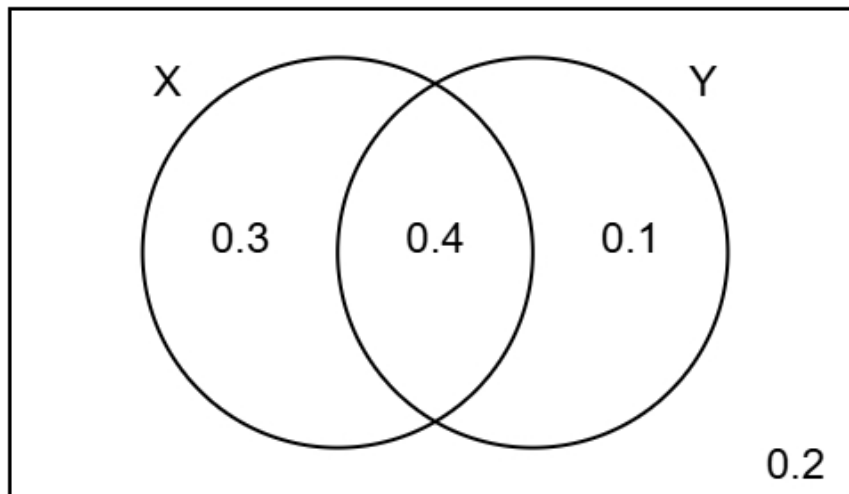
(4 marks)

Write your answer as a decimal.

Select **one** box.

- More people failed the painting challenge in Class Red than in Class Blue.
- The risk of failing the painting challenge having taken Class Red is greater than the risk of failing the painting challenge having taken Class Blue.
- The risk of failing the painting challenge having taken Class Red is lower than the risk of failing the painting challenge having taken Class Blue.
- Less people failed the painting challenge in Class Red than in Class Blue.

- 14 The Venn diagram shows information about the probabilities of two events occurring.  
The events are labelled as X and Y.



- (a) Find the probability of event Y happening.

(1 mark)

Add the probabilities in the circle marked Y together

Leave your answer as a decimal.

\_\_\_\_\_

- (b) Find  $P(X \text{ and } Y)$

(1 mark)

$P(X \text{ and } Y)$  is shown in the overlap of the Venn diagram

Leave your answer as a decimal.

\_\_\_\_\_

(c) Find  $P(Y | X)$

(2 marks)

Use the formula to find  $P(Y | X)$

$$P(Y | X) = \frac{P(X \text{ and } Y)}{P(X)}$$

(d) Two different events events R and S are independent.

$$P(R) = 0.4$$

$$P(S) = 0.8$$

Find  $P(R \text{ and } S)$

(2 marks)

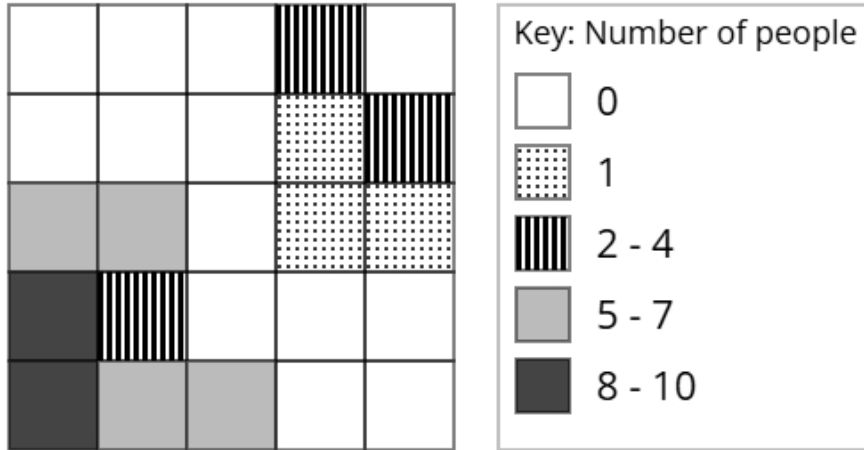
Use the formula for independent events

$$P(R \text{ and } S) = P(R) \times P(S)$$

Leave your answer as a decimal.

\_\_\_\_\_

- 15** The choropleth map below represents a town square that has been divided into 25 squares of equal area. Aisha has collected data about the popularity of different parts of the town square. The number of people recorded in each square on one Thursday morning is shown.



- (a) Calculate an estimate of the total number of people that were recorded on Thursday.

(3 marks)

Find the midpoints for the groups.

Multiply each key with amount of squares and add them up.

(b) Aisha would like to open a flower stall in the town square.

After analysing the data, she decides that she should open the flower stall in the corner of the town square shown at the bottom left of the choropleth map.

Using the information in the choropleth map, assess the validity of Aisha's conclusion.

(2 marks)

Select the **two** correct statements (**two** statements are incorrect).

because there were less people at the bottom left of the town square.

Aisha's comment is not valid

because there were more people at the bottom left of the town square.

Aisha's comment is valid

(c) Daniel argues that the method used by Aisha to collect the data is not appropriate for reaching a reliable conclusion.

Assess whether Daniel's argument is correct and give a reason.

(1 mark)

Select the **two** correct statements (**two** statements are incorrect).

because the data was only collected on one Thursday.

Daniel is not correct

Daniel is correct

because there was a large amount of data collected.