AQA

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Centre number | | | | | | Candidate number | | | | |

Surname _____

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GCSE
STATISTICS

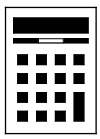
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Foundation tier Paper 2

Tuesday 18 June 2019 Morning Time allowed: 1 hour 45 minutes

Materials

For this paper you must have:
- a calculator
- mathematical instruments.



Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of the page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross out any work you do not want to be marked.

Information
- The marks for the questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
TOTAL	

Answer **all** questions in the spaces provided.

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1 For which data source would you have the greatest level of control of variables?

Circle your answer.

[1 mark]

observation | field experiment | laboratory experiment | natural experiment

1

2 Circle the value which indicates no correlation between two variables.

[1 mark]

1 | 0 | –1 | –100

1

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3 Amir is comparing the taste of sprouts from two farms.

He cooks a sample from each farm and asks volunteers to score the taste out of 10

3 (a) Which of these variables is the explanatory variable?

Circle your answer.

[1 mark]

the score given to the taste

how well the sample was cooked

which farm the sprouts were from

the gender of the volunteer

3 (b) Which of these variables is a possible extraneous variable?

Circle your answer.

[1 mark]

the score given to the taste

how well the sample was cooked

which farm the sprouts were from

the name of the farmer

2

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4 The table shows the number and the gender of teachers at three schools.

	Bushfield Primary School	**Ridge High School**	**Lindsey Academy**
Number of males	2	36	20
Number of females	12	24	6

4 (a) How many teachers are at **Ridge High School**?

[1 mark]

Answer _____

4 (b) What fraction of teachers at **Ridge High School** are male?

Give your answer in its simplest form.

[2 marks]

Answer _____

4 (c) Compare the **total number** of teachers in each school.

[2 marks]

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4 (d) Compare the proportions of each **gender** of teacher in each school.

You **must** support your comparison with appropriate calculations.

[3 marks]

8

Turn over for the next question

Do not write outside the box

5 The table shows information about sales of phones worldwide in 2017.

Make	Number of sales (millions)	Market share (%)
Samsung	318.3	21.7
Apple	215.8	
Huawei	153.1	10.4
OPPO	111.8	7.6
Xiaomi	92.4	6.3
Others	577.7	39.3

5 (a) Which company had sales of just over half of those of Apple?

[1 mark]

Answer _____

5 (b) Calculate Apple's market share to one decimal place.

[2 marks]

Answer _____ %

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5 (c) Wang says,

"The top 3 companies in the table have over 50% of the sales of phones."

Comment on Wang's statement, supporting your answer with evidence.

[2 marks]

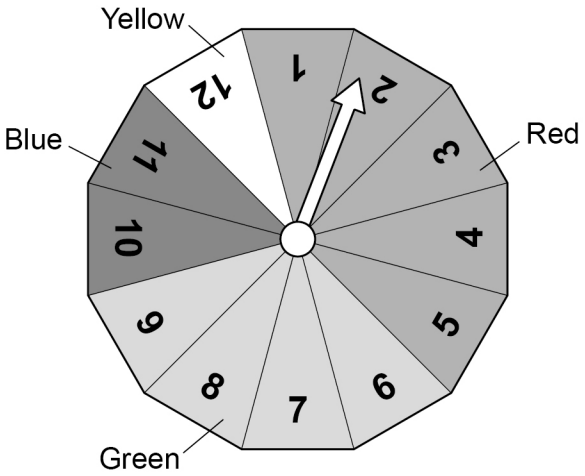
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Turn over for the next question

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6 The fair spinner shown has 12 equal sections.

The arrow is spun once.



6 (a) Work out the probability that the arrow stops on red or blue.

[2 marks]

Answer _____

6 (b) Work out the probability that the arrow does **not** stop on yellow.

[2 marks]

Answer _____

4

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7 Josh likes to play the game 'Knight Fort' with his friends.

When he logs on to his console some of his friends are usually already logged on.

Josh keeps a record over 5 consecutive days in **term time** of the number of friends logged on at 8pm.

The table shows the results.

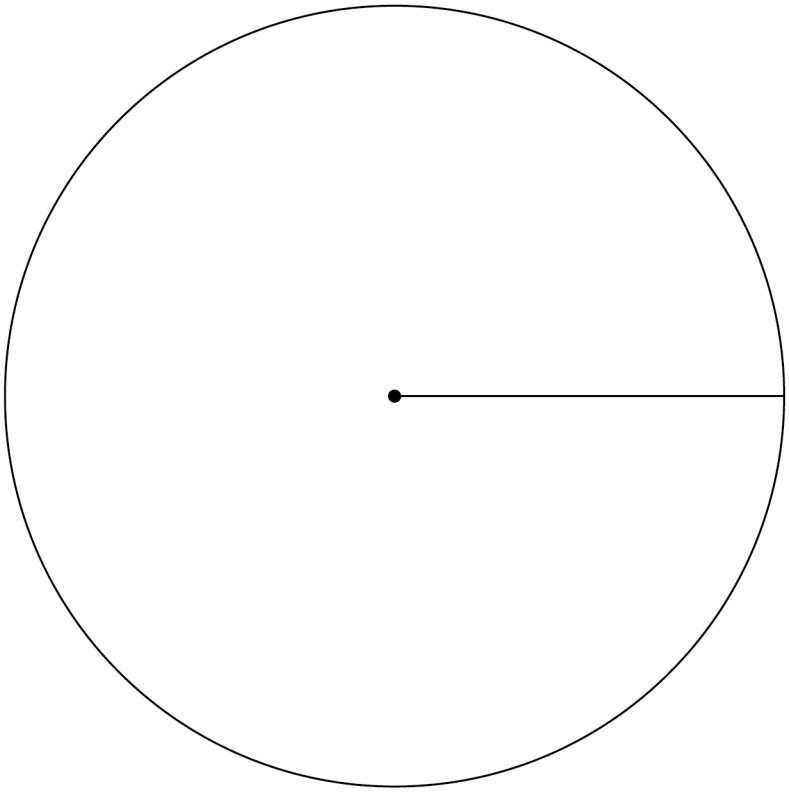
Day (term time)	Monday	Tuesday	Wednesday	Thursday	Friday
Number of friends	3	5	6	10	12

7 (a) Describe the trend in the data.

[1 mark]

7 (b) Draw a fully labelled pie chart to illustrate the data.

[4 marks]



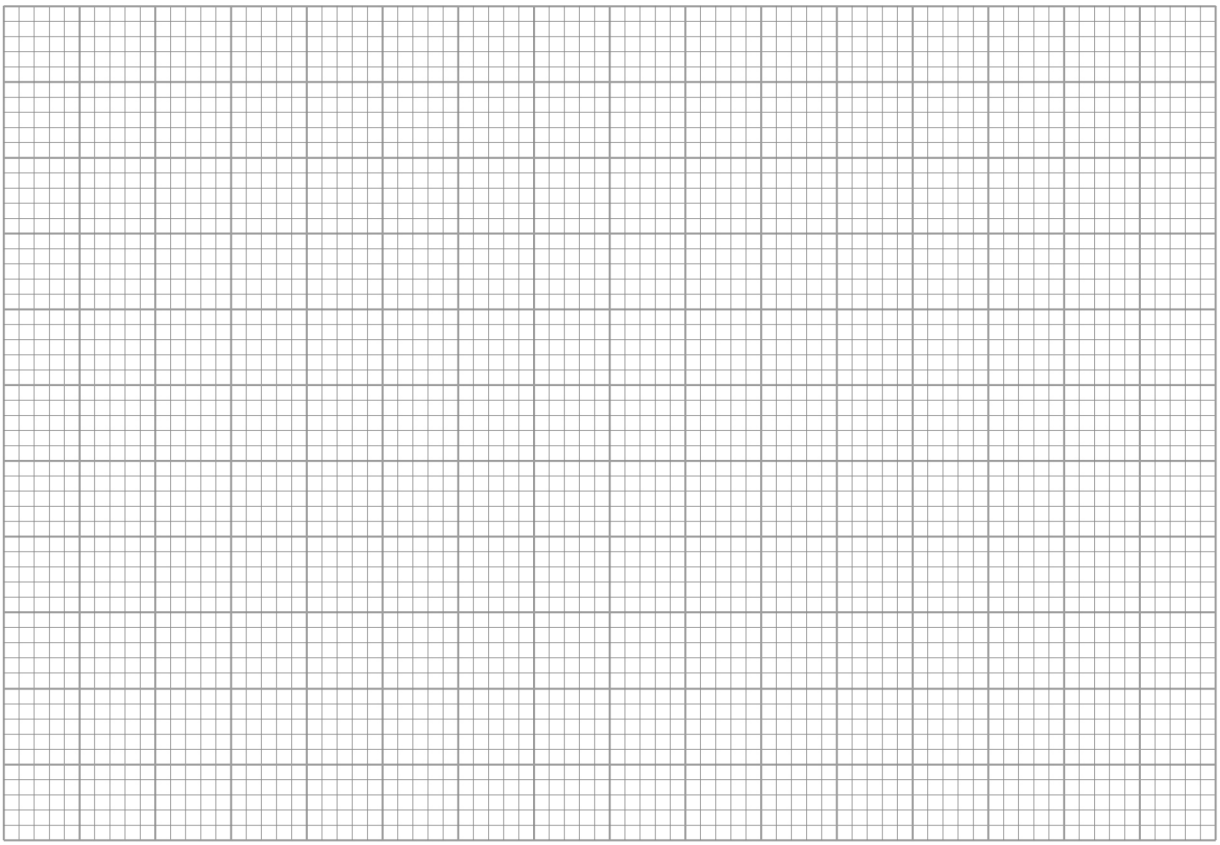
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7 (c) Josh also collected data for 8pm for 5 days in the **Easter holidays**.

Day (Easter holidays)	Monday	Tuesday	Wednesday	Thursday	Friday
Number of friends	15	14	11	10	8

On the grid below, draw a diagram suitable for showing **both** the term time and Easter holiday data at the same time.

[4 marks]



Do not write outside the box

7 (d) Comment, with justification, on whether these statements from Josh are true or false.
[3 marks]

Statement 1

'Overall, more friends are already logged on in the Easter holidays.'

Comment _____

_____

Statement 2

'Every day there were more friends already logged on in the Easter holidays than in term time.'

Comment _____

_____

Statement 3

'When the two sets of data are combined, the day having the most friends already logged on is Thursday.'

Comment _____

_____

12

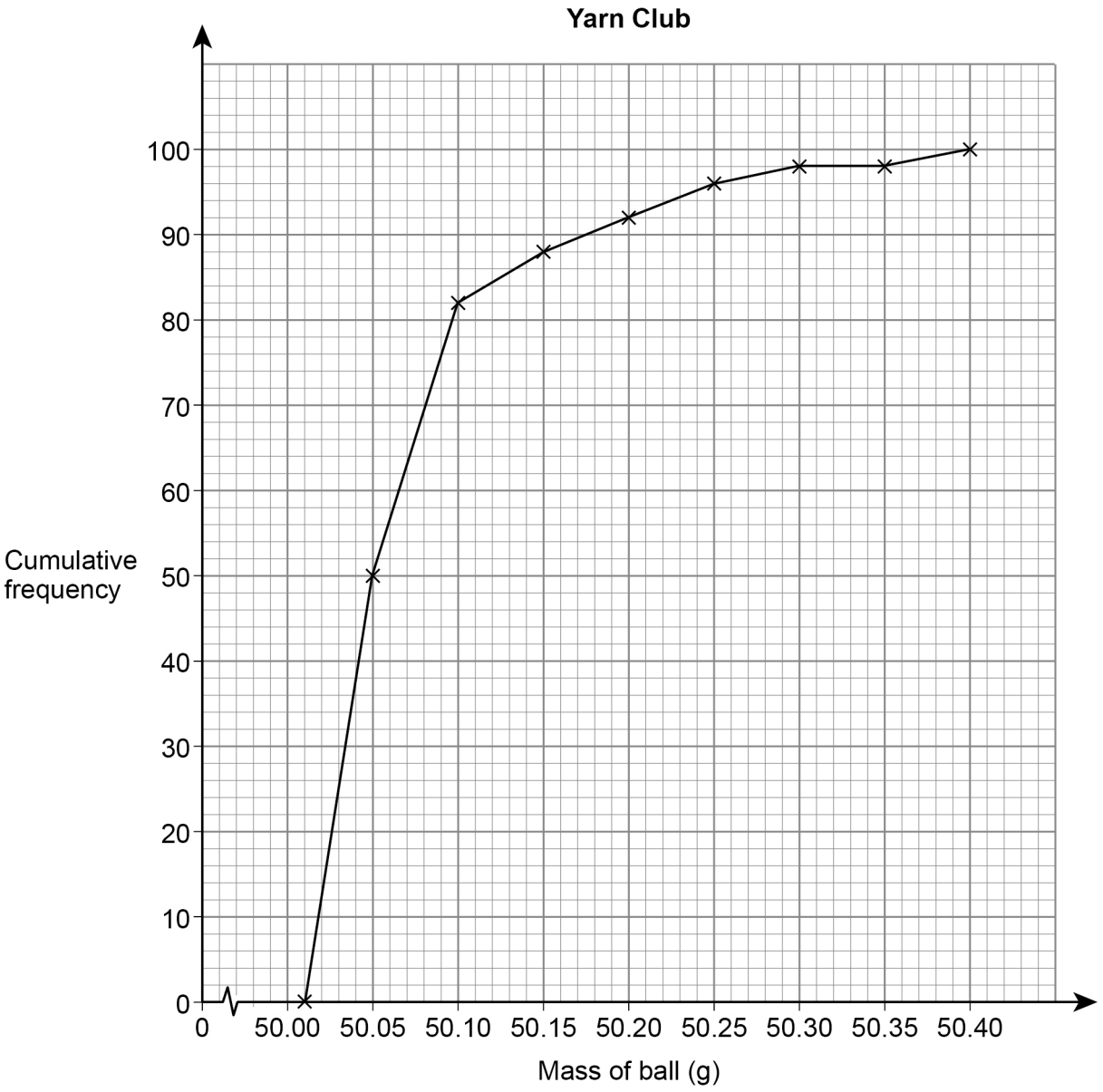
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8 Wool is sold as 50-gram balls by two online suppliers, 'Yarn Club' and 'Lydia's Wool'.

Samples from both suppliers are tested to ensure the balls have a mass of at least 50 grams.

The cumulative frequency graph shows information from the 'Yarn Club' sample.



Do not write outside the box

8 (a) Write down, to one decimal place, the mass of the heaviest ball of wool from this sample.

[1 mark]

Answer _____ grams

8 (b) Are all the balls in this sample above the advertised mass?

Give a reason for your answer.

[1 mark]

8 (c) Here are some statistics about the sample of wool from 'Lydia's Wool'

- lowest value 49.98 grams
- lower quartile 50.02 grams
- median 50.07 grams
- upper quartile 50.11 grams
- highest value 50.57 grams

8 (c) (i) Are all the balls in this sample above the advertised mass?

Give a reason for your answer.

[1 mark]

Question 8 continues on the next page

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8 (c) (ii) Compare statistically the masses of the samples from the two suppliers.

[6 marks]

9

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9 Some Year 11 girls investigate how much time different age groups spend on the internet.

9 (a) Write down a possible hypothesis they could use.

[1 mark]

9 (b) Keiva designs a data collection sheet.

The first few rows are shown.

Person	Age Group (0 – 10, 10 – 20 or over 20)	How long on internet?
1		
2		
3		
4		

Suggest **two** improvements to the data collection sheet.

Do **not** draw a new data collection sheet.

[2 marks]

Improvement 1 _____

Improvement 2 _____

Question 9 continues on the next page

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9 (c) Holly decides to collect her data by recording the exact age, in years, of everyone she asks.

9 (c) (i) Give **one** advantage of collecting exact ages over having age groups.

[1 mark]

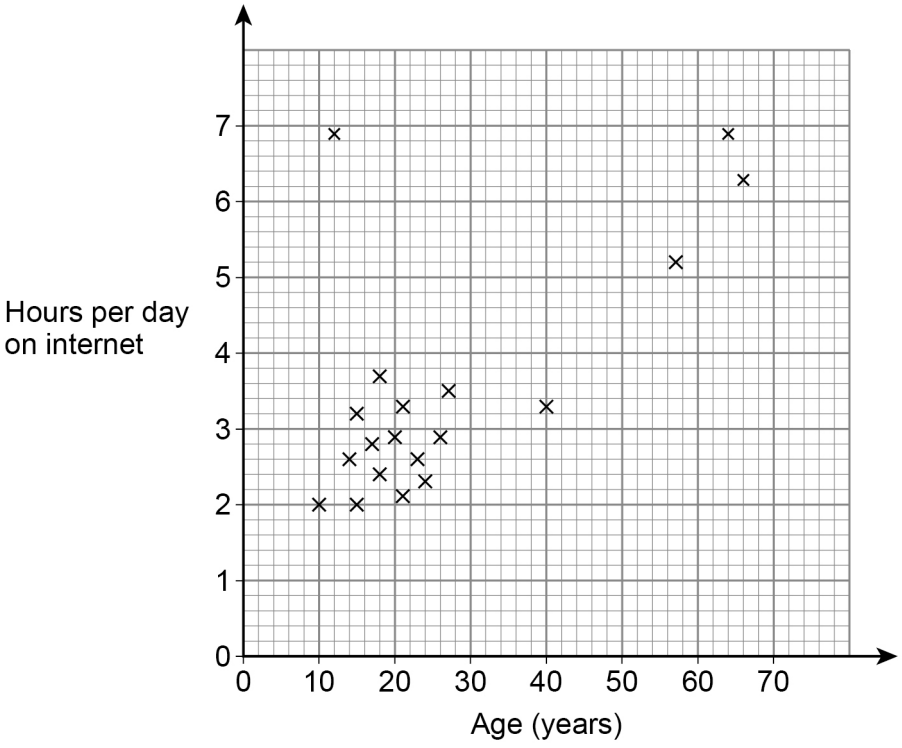
9 (c) (ii) Give **one** disadvantage of collecting exact ages over having age groups.

[1 mark]

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9 (d) The scatter diagram shows the results from Holly's data collection.

All points were correctly plotted.



9 (d) (i) Give **one** criticism about the age of people Holly collected data from.

[1 mark]

9 (d) (ii) Holly says,

"Apart from one outlier, my graph seems to show negative correlation."

Circle the outlier on the graph and comment on what Holly says about the correlation.

[2 marks]

Question 9 continues on the next page

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9 (d) (iii) What does the correlation show in this context?

[1 mark]

9 (e) Courtney decides to use grouped data for her sample of people.

The table shows information about the time spent per day on the internet for a sample of people who are **over 50 years old**.

Time, h (hours)	**Frequency**
$0 \leqslant h \leqslant 1$	44
$1 < h \leqslant 2$	18
$2 < h \leqslant 3$	10
$3 < h \leqslant 4$	6
$4 < h \leqslant 5$	2

9 (e) (i) Work out how many people are in this sample.

[1 mark]

Answer _____

Do not write outside the box

9 (e) (ii) Write down the largest value that the range of these data could be.

[1 mark]

Answer _____ hours

9 (e) (iii) Show that an estimate of the mean time this sample spent on the internet in a day is 1.3 hours.

You may use the blank columns in the table opposite to help you.

[3 marks]

Question 9 continues on the next page

Do not write outside the box

9 (f) Courtney also collected data for a group of people who are all **15 years old**.

The data has,

- an estimated mean of 1.6 hours on the internet per day
- a range of 6 hours.

Use this information, and your answers in **part (e)**, to make **two** comparisons of Courtney's data for people who are 15 years old and for people who are over 50 years old.

[2 marks]

Comparison 1 _____

_____

_____

_____

Comparison 2 _____

_____

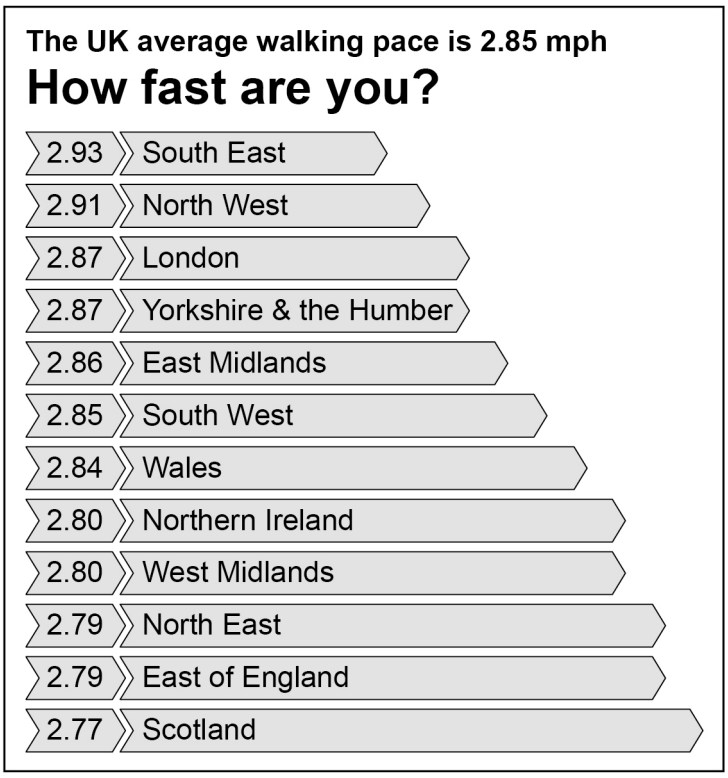
_____

_____

16

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10 Samira records the average walking speed, in miles per hour (mph), of shoppers in different regions of the UK. The diagram shows her results.



10 (a) List the regions in the UK where the walking speed is more than 0.05 mph faster than the **UK average**.

[1 mark]

Answer _____

_____

10 (b) Give **two** reasons why the diagram is misleading.

[2 marks]

Reason 1 _____

_____

_____

Reason 2 _____

_____

_____

Turn over ►

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10 (c) A manager in a shopping centre measures the walking speed (in mph) of a random sample of shoppers in June and a random sample of shoppers in December.

The walking speeds of 25 shoppers in June are shown in the stem-and-leaf diagram.

June										December									
							9	8	**0**										
				7	7	6	4	2	**1**										
	9	8	8	7	6	5	5	2	**2**										
			7	6	4	3	3	1	**3**										
					5	4	1	0	**4**										

Key: 8 | **0** | 7 represents a speed of 0.8 mph in June and a speed of 0.7 mph in December

10 (c) (i) The speeds (in mph) of 25 shoppers in December are,

1.2	3.4	0.9	1.9	2.4	2.7	1.6	3.2	2.1	0.7
1.0	2.2	2.5	1.8	4.1	1.7	2.6	1.8	3.2	1.3
2.5	0.7	3.1	2.2	1.4					

Complete the back to back stem-and-leaf diagram above to show the speeds of shoppers in December.

[3 marks]

Do not write outside the box

10 (c) (ii) Without further calculation, make a comparison of the average walking speeds of shoppers in June and December.

[1 mark]

10 (c) (iii) Give a possible reason to explain the difference in average walking speeds in June and December.

[1 mark]

8

Turn over for the next question

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11 The spreadsheet shows the number of people attending Accident and Emergency (A&E) for major hospitals and for all A&E hospitals from 2008 to 2016.

Year	Major hospitals	All A&E hospitals
2008	13 426 136	19 588 344
2009	13 618 300	20 511 908
2010	13 931 715	21 380 985
2011	14 013 922	21 481 402
2012	14 252 068	21 738 637
2013	14 213 148	21 778 657
2014	14 584 736	22 354 781
2015	14 960 805	22 920 435
2016	15 262 758	23 362 301

Source: www.england.nhs.uk

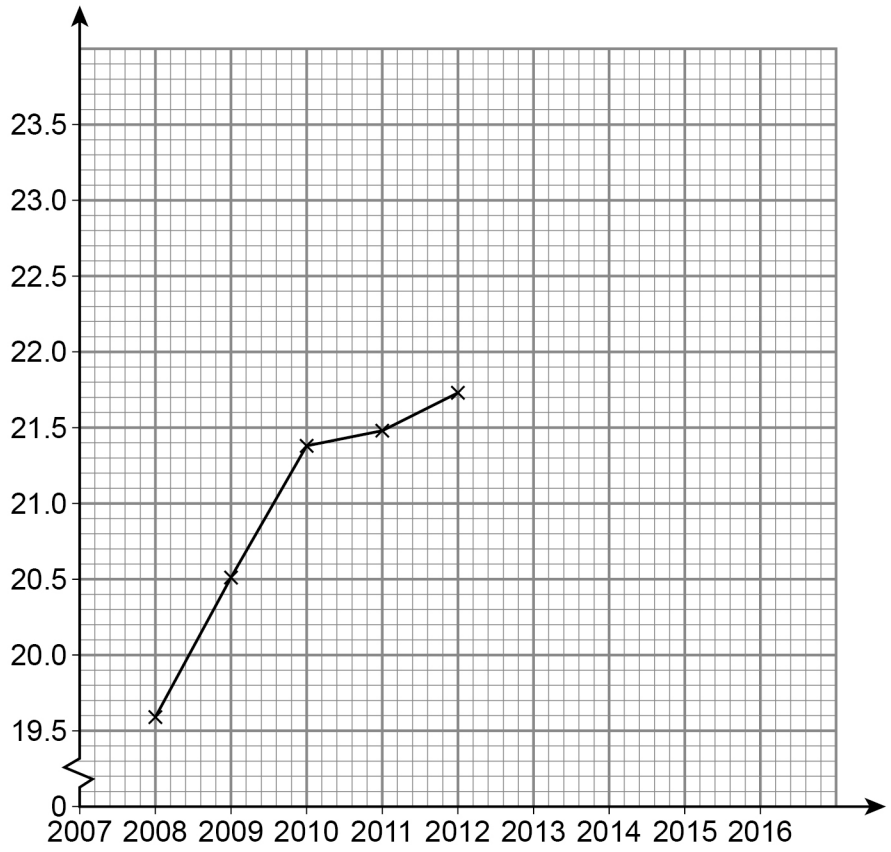
11 (a) Name the year when **Major hospitals** attendances fell.

[1 mark]

Answer _____

Do not write outside the box

11 (b) Here is a partially completed time series graph showing the '**All A&E hospitals**' attendances.



Complete the time series graph including labelling axes.

[4 marks]

11 (c) There is a break in the vertical axis in the time series graph.

Write down **one** positive reason and **one** negative reason for using this break.

[2 marks]

Positive _____

_____

Negative _____

_____

Question 11 continues on the next page

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11 (d) Dan said,

"As there are more people going to A&E, you must have to wait longer."

Give a reason why Dan's statement may **not** be true.

[1 mark]

8

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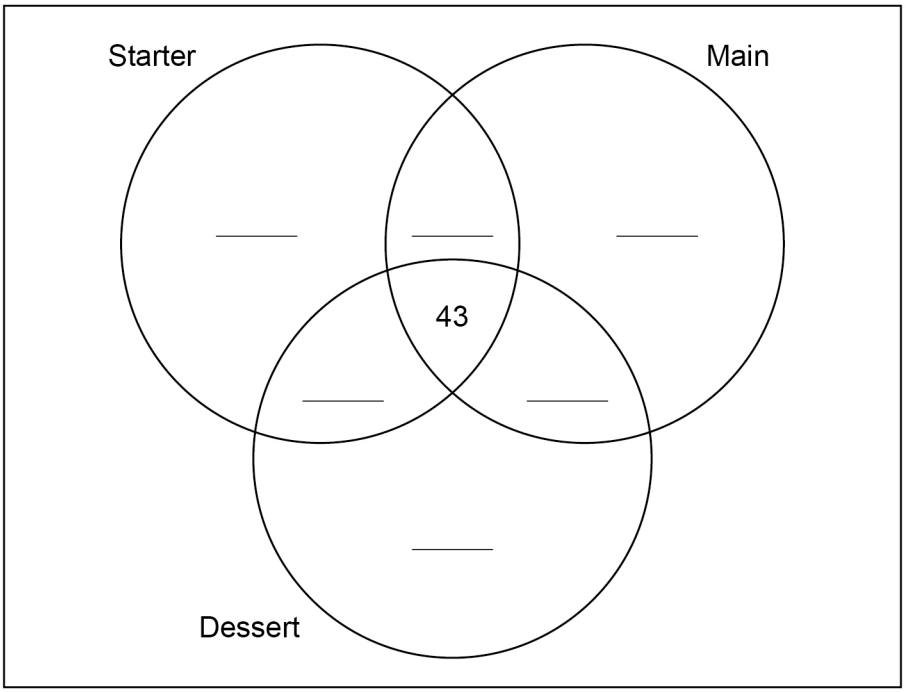
12 A restaurant serves three courses, starters, mains and desserts.

The manager records the choices of 100 people.

- 43 people had all 3 courses.
- 17 had **only** a starter and a main.
- 22 had **only** a main course and a dessert.
- The remaining people **only** had a main.

12 (a) Write the **six** missing numbers in the Venn diagram to show this information.

[4 marks]



12 (b) One of the people who did not have a starter was chosen at random.

What is the probability that this person had a dessert?

[2 marks]

Answer _____

6

END OF QUESTIONS

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