Write your name here

Surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9 - 1)

Centre Number	Candidate Number

Statistics

Paper 2

Foundation Tier

Specimen Papers Set 1	Paper Reference
Time: 1 hour 30 minutes	**1ST0/2F**

You must have:
Ruler graduated in centimetres and millimetres, protractor, pen, HB pencil, eraser, scientific calculator.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Scientific calculators may be used.
- You must **show all your working out** with **your answer clearly identified at the end of your solution**.

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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S 5 9 3 0 8 A 0 1 2 0

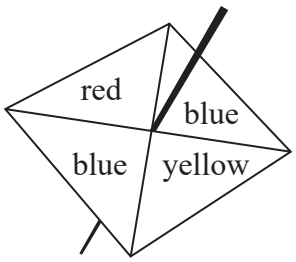
Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Here is a fair 4-sided spinner.



The spinner is spun once.

(a) Underline the word from the list below that best describes the likelihood that the spinner will land on green.

impossible certain evens unlikely likely

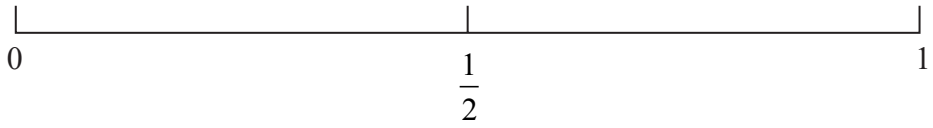
(1)

(b) Underline the word from the list below that best describes the likelihood that the spinner will land on red or yellow.

impossible certain evens unlikely likely

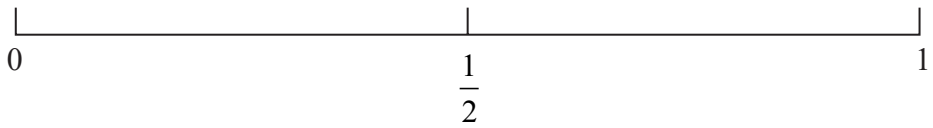
(1)

(c) On the probability scale below, mark with a cross (×) the probability that the spinner will land on yellow.



(1)

(d) On the probability scale below, mark with a cross (×) the probability that the spinner will land on red or blue.

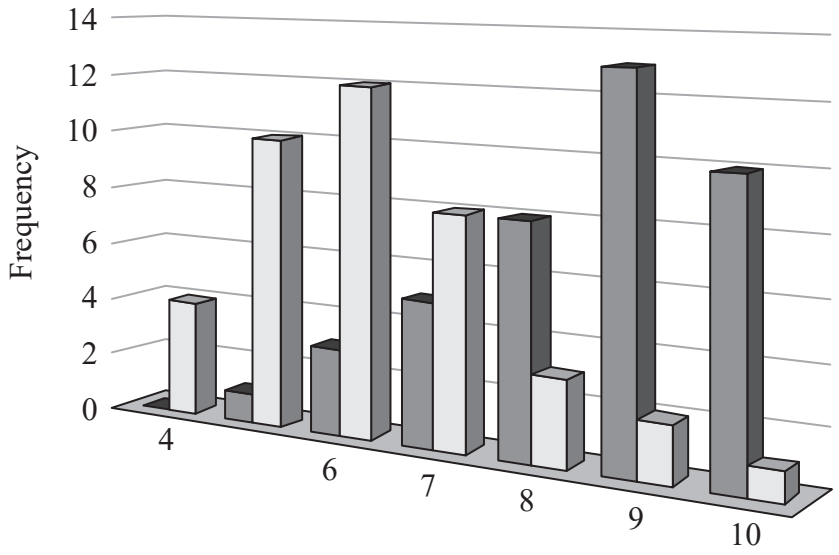


(1)

(Total for Question 1 is 4 marks)

2 Robert collected information about the shoe sizes of 40 men and the shoe sizes of 40 women.

He produced this diagram to show his results.



(a) Write down three things that could be misleading or that are wrong with Robert's diagram.

1 .....

2 .....

3 .....

(3)

Nathalie has collected information about the number of pairs of shoes owned by each of 11 people.

11 11 7 12 8 7 10 11 15 3 5

(b) Work out the median.

.....

(2)

(Total for Question 2 is 5 marks)

3 The winner of a 2017 US spelling competition was Ananya.

The number of letters in each of the last 10 words that she was asked to spell were

8 8 9 9 6 10 10 4 10 10

(Source: *www.theguardian.com*)

(a) Work out the mean.

.....

(2)

(b) Work out the range.

.....

(2)

Rohan was the other finalist in the spelling competition.

Here are the mean and the range for the numbers of letters in the last 10 words that he was asked to spell.

	Mean	**Range**
Number of letters	10.1	9

(Source: *www.theguardian.com*)

(c) Use your answers to part (a) and part (b) to compare the distribution of the numbers of letters in the words Ananya was asked to spell with the distribution of the numbers of letters in the words Rohan was asked to spell.
Interpret your comparisons.

.....

.....

.....

.....

.....

(3)

(Total for Question 3 is 7 marks)

4 Jaspreet wants to find out about the method of transport that students use to get to school. She plans to ask the first 20 students arriving at school one morning how they have travelled to school.

(a) Give one advantage and one disadvantage of Jaspreet's plan.

Advantage .....

.....

Disadvantage .....

.....

(2)

Rosemary thinks it would be better to take a random sample.
She is going to use a database of all of the students at the school to select her random sample.

(b) Explain how Rosemary can use the school database to select a random sample of 20 students.

.....

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(3)

(Total for Question 4 is 5 marks)

5 Jay recorded the total number of shots at goal in a season for each of the 20 footballers who scored the most goals in the English Premier League.
Here are the results.

89	86	87	79	53	102	74	83	33	60
51	88	61	45	59	69	38	42	34	70

(Source: *www.bbc.co.uk*)

(a) Complete the stem and leaf diagram for this information.

3	
4	
5	
6	
7	
8	
9	
10	

Key:

(3)

(b) Find the median.

.....

(2)

(c) Explain why it is not possible to find the mode of Jay's results.

.....

.....

(1)

(d) Find the number of footballers in Jay's results that had fewer than 40 shots at goal.

.....

(1)

Jay knows that on average 57% of these footballers' shots at goal are on target.
Jay says,
"The three footballers with the most number of shots had a total of 159 shots at goal on target".

(e) Is Jay correct?
Give a reason for your answer.

.....

.....

.....

(2)

(Total for Question 5 is 9 marks)

6 The greatest temperature in London was recorded for each day for the first 20 days in January.

The frequency table shows information about these temperatures.

Greatest temperature (°C)	5	6	7	8	9	10	11
Frequency	3	3	5	2	3	2	2

(Source: *www.timeanddate.com*)

(a) Write down the mode.

..... °C

(1)

(b) Work out the range.

..... °C

(2)

(c) Work out the mean.

..... °C

(2)

Sarah recorded the greatest temperature in her garden each day in March.
The mean of the greatest temperatures in her garden for the first 30 days of March was 13.5 °C.
On 31 March, the greatest temperature in Sarah's garden was 17 °C.

(d) (i) Is the mean of the greatest temperatures in Sarah's garden for all 31 days of March greater than, equal to, or less than 13.5 °C?

Put a tick (✓) in one of the boxes below.

Greater than ☐ Equal to ☐ Less than ☐

(ii) Give a reason for your answer.

.....

.....

(2)

(Total for Question 6 is 7 marks)

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7 Salyza works for an IT company.
She wants to collect information about the earnings of workers at the company.
She is going to use a questionnaire.

Here is one of the questions she wants to put on the questionnaire.

> How much do you earn?
>
> £ .....

(a) Explain whether or not this is a suitable question for the questionnaire.

.....

.....

.....

(2)

Here are the annual earnings of the 10 employees at another company.

£21 000	£21 200	£22 250	£23 000	£23 750
£24 000	£25 700	£25 800	£29 000	£51 500

Salyza wants to find a measure of spread for these earnings of these employees.

(b) Explain the advantage of using the interquartile range rather than the range for this information.

.....

.....

(1)

Salyza wants to find an average for the annual earnings of these employees.

(c) Salyza thinks it is more appropriate to use the mean than the median.
Is she right? Give a reason for your answer.

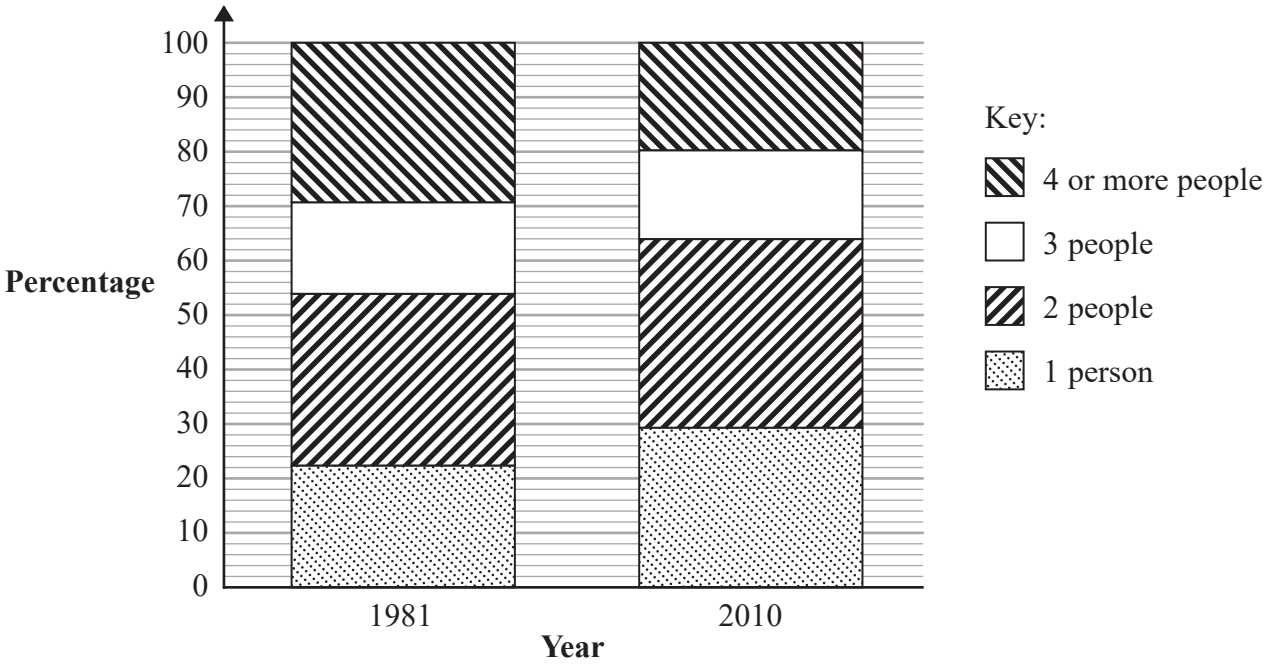
.....

.....

(2)

(Total for Question 7 is 5 marks)

8 The percentage composite bar charts show information, for Great Britain, about the numbers of people per household in 1981 and the numbers of people per household in 2010



(Source: *nationalarchives.gov.uk*)

(a) Find the percentage of households in 1981 with exactly 2 people in them.

.....%

(2)

David says that the percentage composite bar charts show that there were more households with exactly 2 people in them in 2010 than in 1981

(b) Explain why David's conclusion may **not** be correct.

.....

.....

.....

(1)

(c) Explain why it would not be appropriate to display the information shown in the percentage composite bar charts as a time series graph.

.....

.....

(1)

(Total for Question 8 is 4 marks)

9 In 2015 the total population of the UK was 65 110 000
In the same year, the number of births in the UK was 697 852

(Source: *www.ons.gov.uk*)

(a) Using the formula below, work out the crude birth rate for the UK in 2015

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

Give your answer correct to 1 decimal place.

.....

(2)

The following table gives the 2015 crude birth rate for Australia and the 2015 crude birth rate for the USA.

	Australia	**USA**
Crude birth rate for 2015	13	12

(Source: *data.worldbank.org*)

Ben says that in 2015 more babies were born in Australia than in the USA because Australia had the greater crude birth rate.

(b) Explain why Ben's reasoning is **not** correct.

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(1)

(Total for Question 9 is 3 marks)

10 Melissa has a biased coin.
When the coin is flipped, it can land either Heads or Tails.
The probability that the coin lands Heads is 0.6

Melissa is going to flip the coin twice.

She says,

> "The probability that the coin lands Heads both times is greater than the probability that the coin lands Tails exactly once".

Is she correct?
You must justify your answer.

(Total for Question 10 is 5 marks)

11 Tracy wants to find out what improvements to the youth club are wanted by the members of the club.
She plans to give each member of the club a questionnaire.

Here is part of the questionnaire.

1. Name: .....
2. Age: 10 to 12 years ☐ 12 to 14 years ☐ 14 to 16 years ☐
3. Do you agree that the condition of the club needs improving?

   Yes ☐ No ☐ Don't know ☐
4. How much time do you spend in the youth club?

   .....
5. Do you know someone who has caused damage in the youth club?

   Yes ☐ No ☐

(a) Explain why Question 2 will not give reliable results.

.....

.....

(1)

(b) Explain why Question 3 is not a good question.

.....

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(1)

(c) Explain why there might be a problem with the answers given to Question 4

.....

.....

(1)

(d) Explain why the answers given to Question 5 may not be valid.

.....

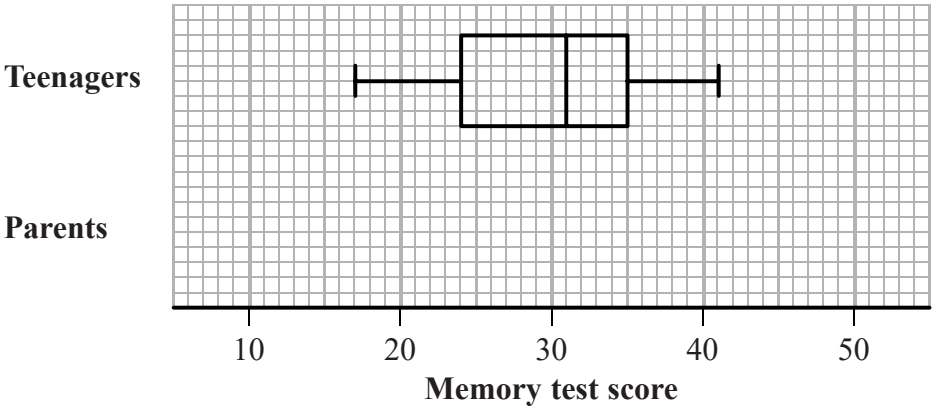
.....

(1)

(Total for Question 11 is 4 marks)

12 Matthew recorded the scores in a memory test taken by some teenagers and by their parents.
The teenagers took the same test as their parents.

The box plot shows information about the recorded test scores for the teenagers.



The table gives information about the recorded test scores for the parents.

Least score	Lower quartile	Median	Upper quartile	Greatest score
12	21	29	35	39

(a) On the grid above, draw a box plot for the recorded test scores for the parents.

(2)

(b) Compare the distributions.
Give three comparisons and interpret one of your comparisons.

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.....

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(4)

The information for the teenagers is based on data collected from 56 teenagers.

(c) Estimate the number of these teenagers whose recorded test score was greater than 24

.....

(2)

(Total for Question 12 is 8 marks)

13 Julie was investigating the relationship between the marks gained by students in their GCSE Mathematics exam and the marks gained by the same students in an A-level Mathematics exam.

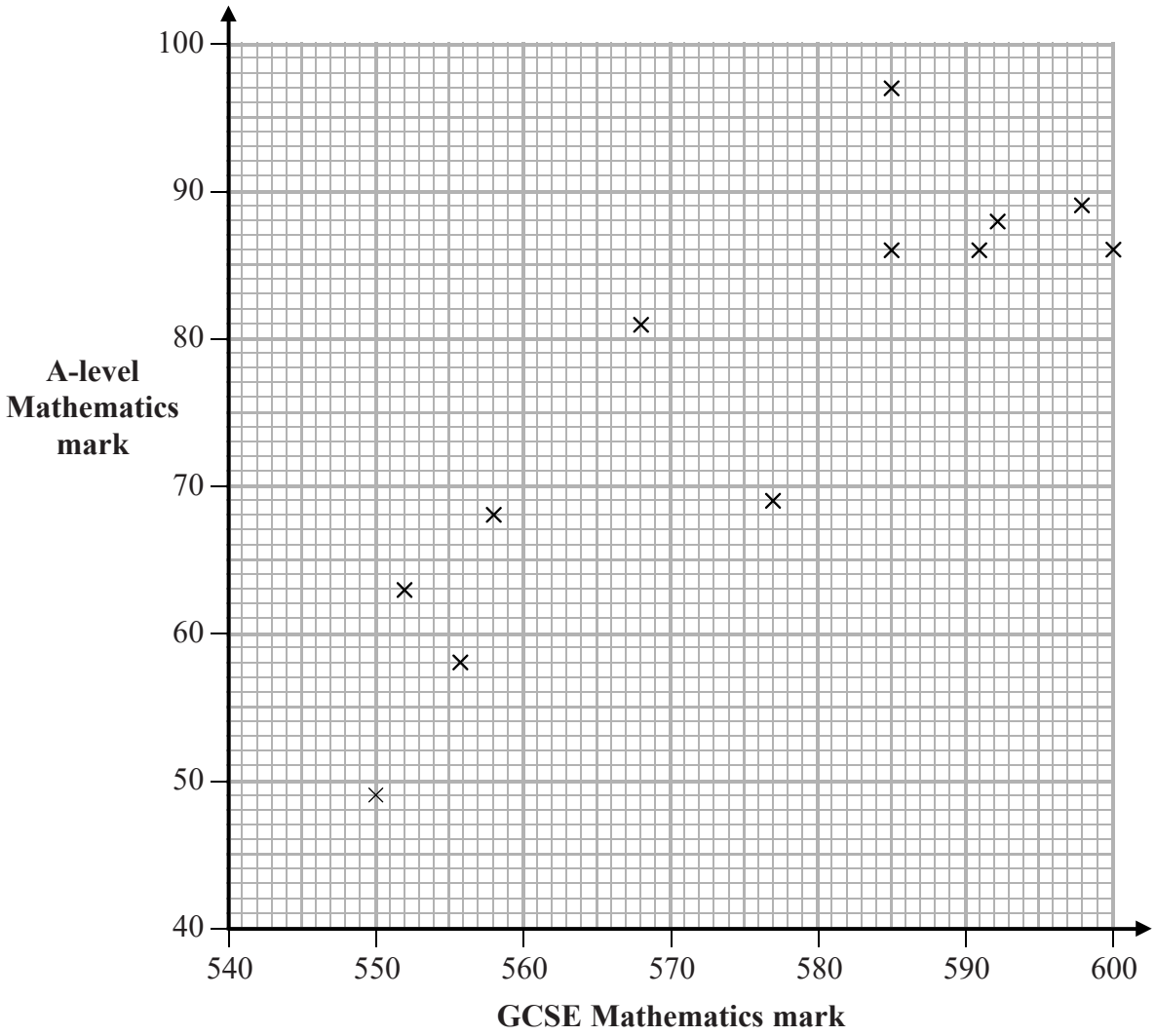
(a) Suggest a hypothesis Julie could use.

.....

.....

(1)

Julie drew a scatter diagram using the marks gained in GCSE Mathematics and the marks gained in A-level Mathematics by each of 12 students.



(b) For this scatter diagram, explain why the GCSE Mathematics mark is the explanatory variable.

.....

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(1)

(c) Explain, giving a statistical reason, whether or not the scatter diagram supports your hypothesis in part (a).

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.....

(2)

Using statistical software, Julie obtained the following information for her 12 students.

Mean GCSE Mathematics mark	578
Mean A-level Mathematics mark	78
Gradient of line of best fit	0.7

(d) Using this information, draw a line of best fit on the scatter diagram.

(2)

(e) Interpret the gradient of the line of best fit.

.....

.....

(1)

Julie wants to use the line of best fit to predict the A-level Mathematics mark for a 13th student. For GCSE Mathematics this student gained a mark of 540

(f) Explain whether or not it would be appropriate to use the line of best fit to make her prediction.

.....

.....

(1)

(Total for Question 13 is 8 marks)

14 Tariq wants to investigate the distance people travel to get to their holiday destination and the price of the holiday.

He is going to write a plan for this investigation.

Write down **one** thing that he should include in his plan for each of

- data collection
- presenting and interpreting diagrams
- presenting and interpreting calculations

Explain why each of your choices is appropriate.

You may use the blank space below to plan your answer and write your answer on the lines provided on the opposite page.

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(Total for Question 14 is 6 marks)

TOTAL FOR PAPER IS 80 MARKS

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