AQA

Surname _____

Forename(s) _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

I declare this is my own work.

GCSE
STATISTICS

F

Foundation Tier Paper 2

8382/2F

Monday 17 June 2024 Afternoon

Time allowed: 1 hour 45 minutes

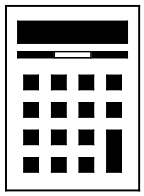
At the top of the page, write your surname and forename(s), your centre number, your candidate number and add your signature.

[Turn over]

MATERIALS

For this paper you must have:

- **a calculator**
- **mathematical instructions.**



INSTRUCTIONS

- **Use black ink or black ball-point pen. Draw diagrams in pencil.**
- **Answer ALL questions.**
- **You must answer the questions in the spaces provided. Do not write on blank pages.**
- **If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).**
- **Do all rough work in this book. Cross out any work you do not want to be marked.**

INFORMATION

- **The marks for 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.**

DO NOT TURN OVER UNTIL TOLD TO DO SO

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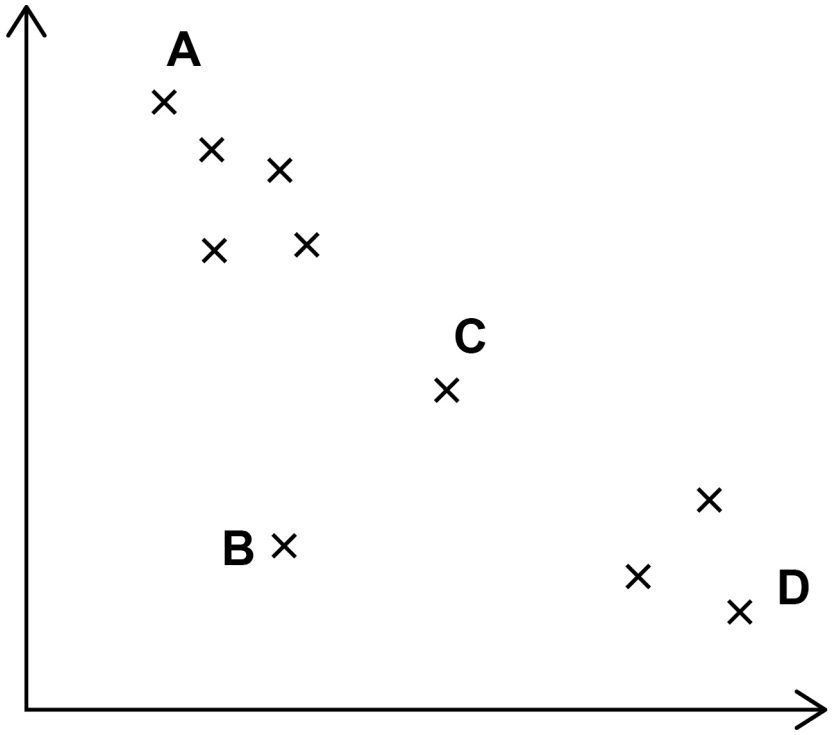
Answer ALL questions in the spaces provided.

1 **Here is a scatter diagram.**

Four of the points have been labelled.



Which ONE of these points is an outlier?

Circle the letter of the outlier. [1 mark]

A **B** **C** **D**

2 A fair, six-sided dice is rolled once.

Circle the probability of getting a 4 [1 mark]

$\frac{1}{6}$ $\frac{1}{2}$ $\frac{4}{6}$ 4

3 Tick (✓) the example of qualitative data. [1 mark]

☐ The time it takes to complete a race

☐ The number of people who run a race

☐ The age of people who run a race

☐ The weather on race day

4 **Xian is investigating how many people in his office cycle to work.**

Circle the term which best describes ALL the people who work in his office. [1 mark]

Census **Population**

Sample **Survey**

[Turn over]

4

5 32 students were asked their favourite type of computer game.

Some of the results are shown.

TYPE OF GAME	TALLY	FREQUENCY
Action		
Simulation	𝍸 | | | |	9
Real-Time Strategy	𝍸 𝍸 |	11
Role-playing		
Sport		
Other		

5 (a) **Here are the rest of the results.**

Role-playing	**Other**	**Action**	**Role-playing**
Role-playing	**Role-playing**	**Action**	**Other**
Other	**Sport**	**Role-playing**	**Role-playing**

Use these results to complete the table, on the opposite page. [3 marks]

5 (b) **How many MORE students said Real-Time Strategy than Sport? [1 mark]**

Answer _____

5 (c) **Vicki says,**

"In this sample Real-Time Strategy was MORE THAN twice as popular as Role-playing."

Comment on this conclusion. [2 marks]

5 (d) **One of the 32 students is picked at random.**

The teacher says,

"The probability that this student's favourite type of game is Simulation is MORE than 0.25"

Is the teacher correct?

Tick (✓) a box.

☐ Yes

☐ No

You MUST give a reason for your answer. [2 marks]

11

_____

_____

_____

_____

[Turn over]

8

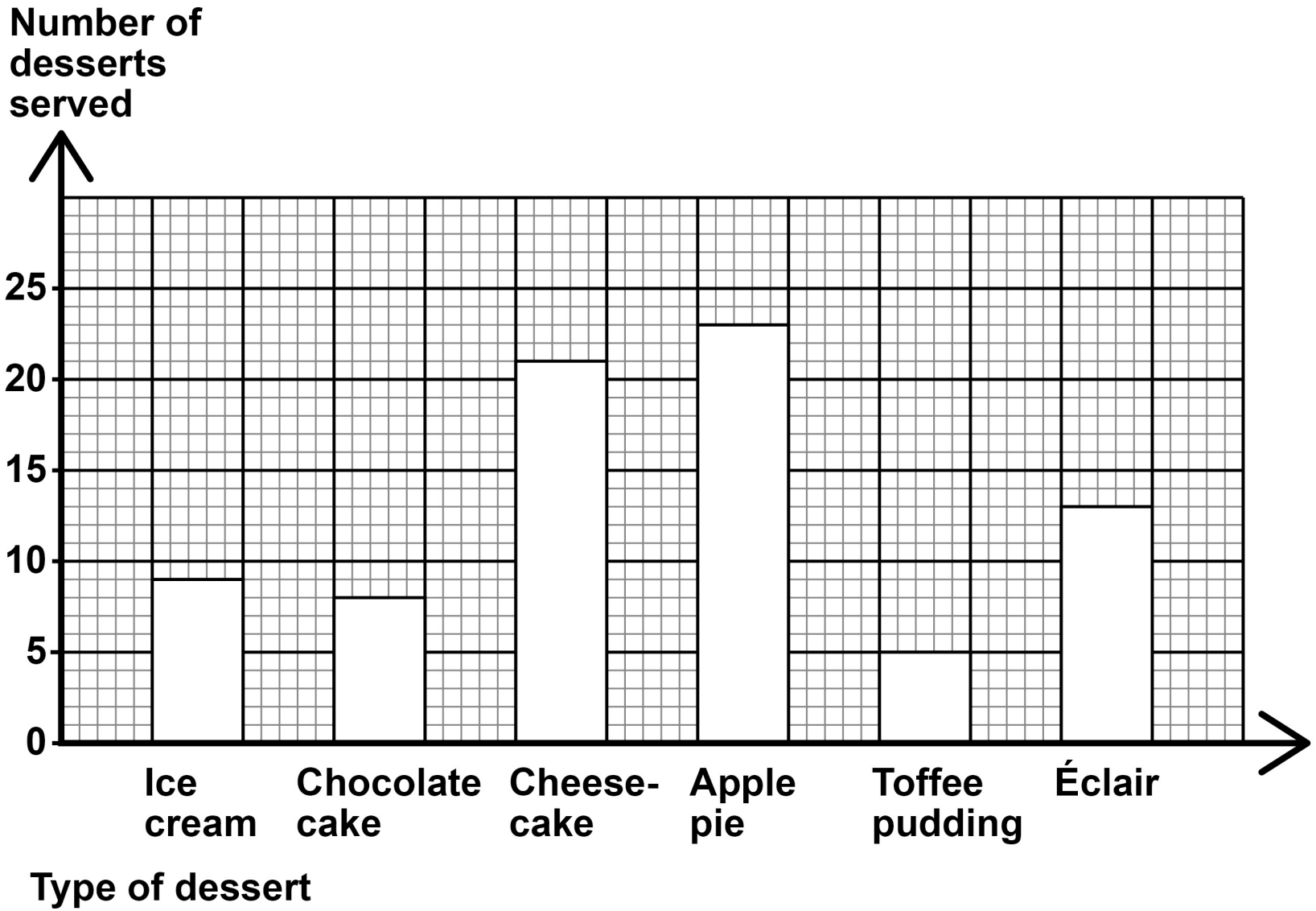
6 **Iona works in a restaurant.**

She records all the desserts that were served to customers on Saturday.

The bar chart, on the opposite page, shows information about the results.

6 (a) **Which dessert was served more than any other? [1 mark]**

Answer _____


Number of desserts served
25
20
15
10
5
0
Ice cream
Chocolate cake
Cheese-cake
Apple pie
Toffee pudding
Éclair
Type of dessert

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6 (b) **The total of two of these desserts was the SAME as the number of cheesecakes served.**

Write down the names of these two desserts. [2 marks]

_____

_____

_____

_____

Answer _____ **and** _____

6 (c) **Iona says,**

“The restaurant should stop serving toffee pudding as it is the least popular dessert.”

Give a reason why she may NOT be correct. [1 mark]

6(d)(i) Iona writes a short survey that she will ask customers to complete after their meal.

Here is one of the questions,

"I'm sure you enjoyed our tasty desserts, didn't you?"

One criticism of the question is that it does not have a response section.

Write ONE different criticism of this question. [1 mark]

[Turn over]

6 (d) (ii) **Another question in Iona's survey is,**

"How many times have you been to this restaurant this year?"

Using all the tick boxes below, design a suitable response section for this question.

Do NOT add any more tick boxes. [2 marks]

☐

☐

☐

☐

7

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[Turn over]

7 (a) **Students in a school can attend clubs after school.**

Kai wants to find out which club is the most popular with Year 7 students.

He asks every 4th student on the list of Year 7 students which clubs they attend.

7 (a) (i) **Name Kai's sampling method. [1 mark]**

Answer _____

7 (a) (ii) **Give TWO advantages of Kai's sampling method. [2 marks]**

Advantage 1 _____

_____

_____

_____

Advantage 2 _____

_____

_____

_____

[Turn over]

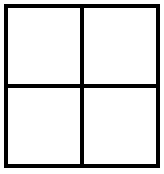
7 (b) **Kai asked 45 Year 7 students which clubs they attend.**

The table shows his data.

CLUB	RUGBY	TENNIS	COMPUTER	OTHER
FREQUENCY	24	15	6	8

7 (b)(i) **Give a reason why the total of the four frequencies is more than 45 [1 mark]**

7 (b) (ii) **Draw a pictogram to represent Kai's data.**
[3 marks]

Key  **represents 4 students**

[Turn over]

7

8 Yamil is the manager at a zoo.

He wants to find out more information about the visitors.

He asks every visitor on Monday to complete a questionnaire after their visit.

8 (a) (i) Write down ONE possible problem with Yamil's data collection method.

Give a solution to the problem. [2 marks]

Problem _____

_____

_____

Solution _____

_____

_____

_____

8 (a) (ii) **Write down a DIFFERENT possible problem with Yamil's data collection method.**

You do NOT need to give a solution to the problem. [1 mark]

Problem _____

_____

_____

[Turn over]

8 (b) One of Yamil's questions in the questionnaire was,

"How many hours did you stay at the zoo today?"

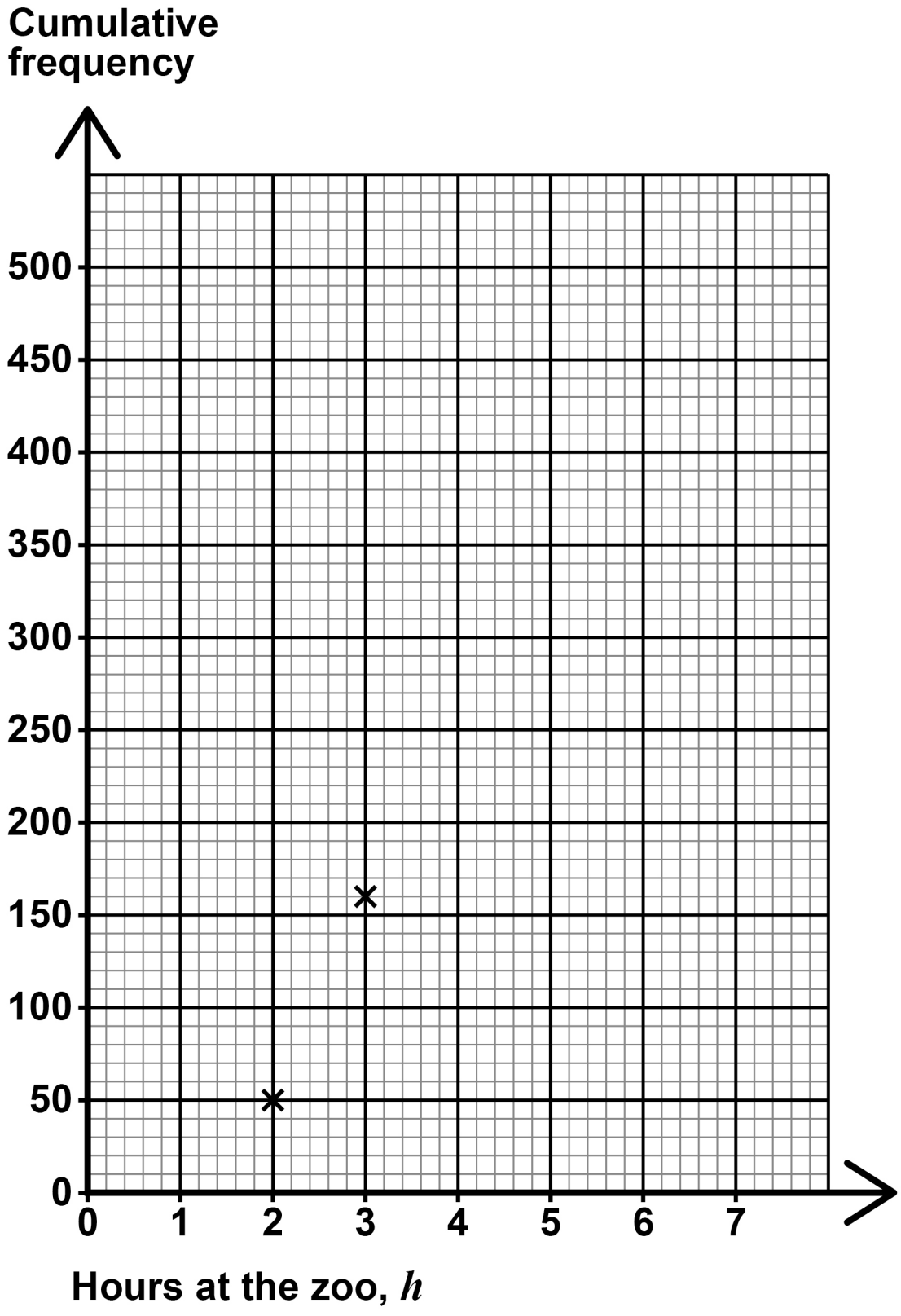
The tables show some information about the results.

Hours at the zoo, h	Frequency
$0 < h \leqslant 2$	50
$2 < h \leqslant 3$	110
$3 < h \leqslant 4$	215
$4 < h \leqslant 5$	
$5 < h \leqslant 6$	25
$6 < h \leqslant 7$	10

Hours at the zoo, h	Cumulative frequency
$h \leqslant 2$	50
$h \leqslant 3$	160
$h \leqslant 4$	375
$h \leqslant 5$	465
$h \leqslant 6$	490
$h \leqslant 7$	

8 (b) (i) Complete the tables by filling in the TWO empty cells. [2 marks]

8 (b)(ii) **Complete the cumulative frequency diagram for the data. [3 marks]**



[Turn over]

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8 (b) (iii) Use the cumulative frequency diagram, on page 27, to work out an estimate of how many visitors stayed at the zoo between $2\frac{1}{2}$ and 5 hours. [2 marks]

Answer _____

8 (b) (iv) Use your cumulative frequency diagram, on page 27, to work out an estimate of the 50th percentile. [2 marks]

Answer _____ hours

[Turn over]

8 (c) **Yamil also wants to investigate how much money the visitors spend in the restaurant.**

He DOES NOT ask the visitors.

Write down ONE way he could get this data.
[1 mark]

8 (d) **Yamil has data for the number of visitors to the zoo and how much was spent in the gift shop, for each day in July.**

The Spearman's rank correlation coefficient for the number of visitors and the total amount of money spent in the gift shop is 0.82

Write a conclusion in context. [1 mark]

9 (a) **Ragnar wants to know if the age of a person is related to the number of apps on their phone.**

Circle the response variable. [1 mark]

The age of the person

The model of phone

The number of apps on the phone

The number of people asked

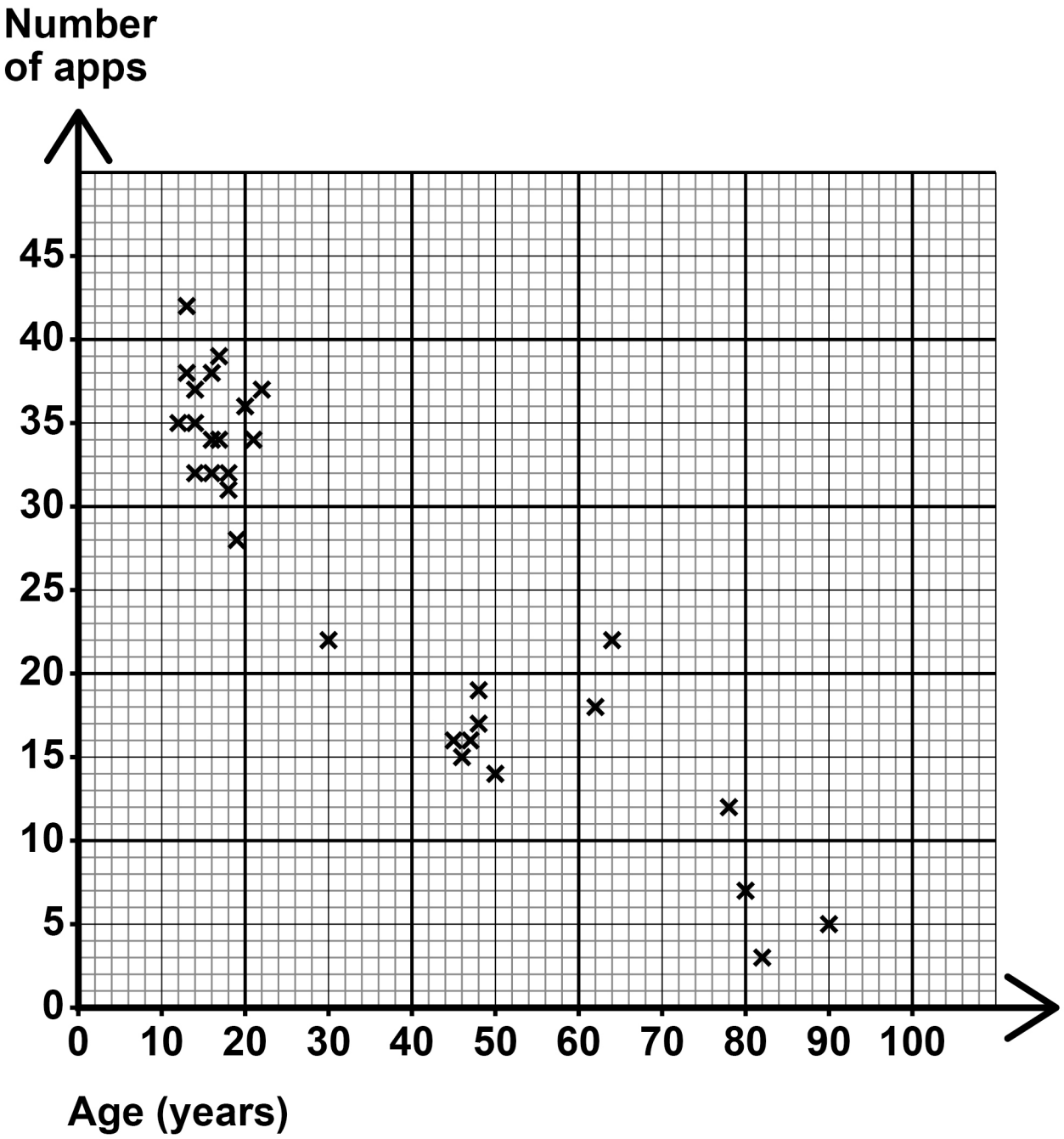
9 (b) **Ragnar draws this scatter diagram, on the opposite page, to show his data.**

Give ONE criticism of Ragnar's data set. [1 mark]

_____

_____

_____


Number of apps
45
40
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
90
100
Age (years)

[Turn over]

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9 (c) **Ragnar works out**

- **the mean age is 35 years**
- **the mean number of apps is 26**

Use this information to draw a line of best fit on the scatter diagram, on page 33. [2 marks]

9 (d) **Tick (✓) a box to describe any correlation in the data. [1 mark]**

☐ **Positive correlation**

☐ **Negative correlation**

☐ **No correlation**

9 (e) **Estimate how many apps a 70-year-old person has on their phone. [1 mark]**

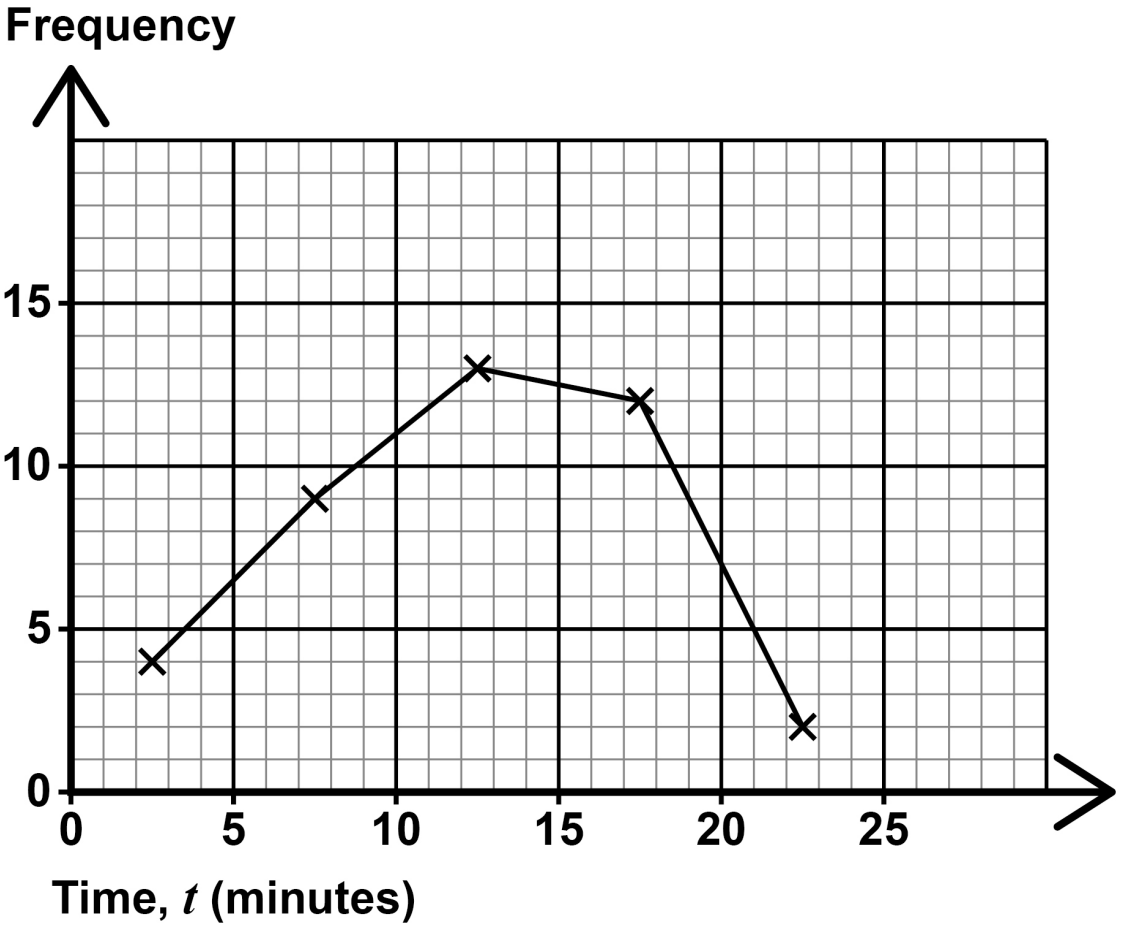
Answer _____

[Turn over]

6

10 A group of people take a test for a new job.

The frequency polygon shows information about the time each person takes to complete the test.



10 (a) Circle the time interval that has a frequency of 9 [1 mark]

$0 < t \leqslant 5$ $5 < t \leqslant 10$

$10 < t \leqslant 15$ $15 < t \leqslant 20$

10 (b) **How many people complete the test?**
[2 marks]

Answer _____

[Turn over]

10 (c) **Calculate an estimate for the mean time it takes to complete the test. [3 marks]**

Answer _____ **minutes**

10 (d) Why is your answer to Question 10 (c) only an estimate? [1 mark]

_____

_____

_____

[Turn over]

7

11 **The table shows the price of 1 gram of gold at the start of each year from 2019 to 2022.**

YEAR	2019	2020	2021	2022
PRICE (£)	32.71	38.08	45.37	43.07

Source: gold.co.uk

11 (a) **Using 2019 as the base year, show that the index number for 2022 is 131.7 to 1 decimal place. [2 marks]**

11 (b) **Here is a statement,**

‘With 2019 as the base year, for every year in the future, the index number MUST be greater than 100’

Do you agree with this statement?

Tick (✓) a box.

☐ **Yes**

☐ **No**

Give a reason for your answer. [1 mark]

_____

_____

_____

3

12 **Sita is investigating the fuel type of new cars sold in the UK in 2019 and 2021.**

She finds this information about 2019.

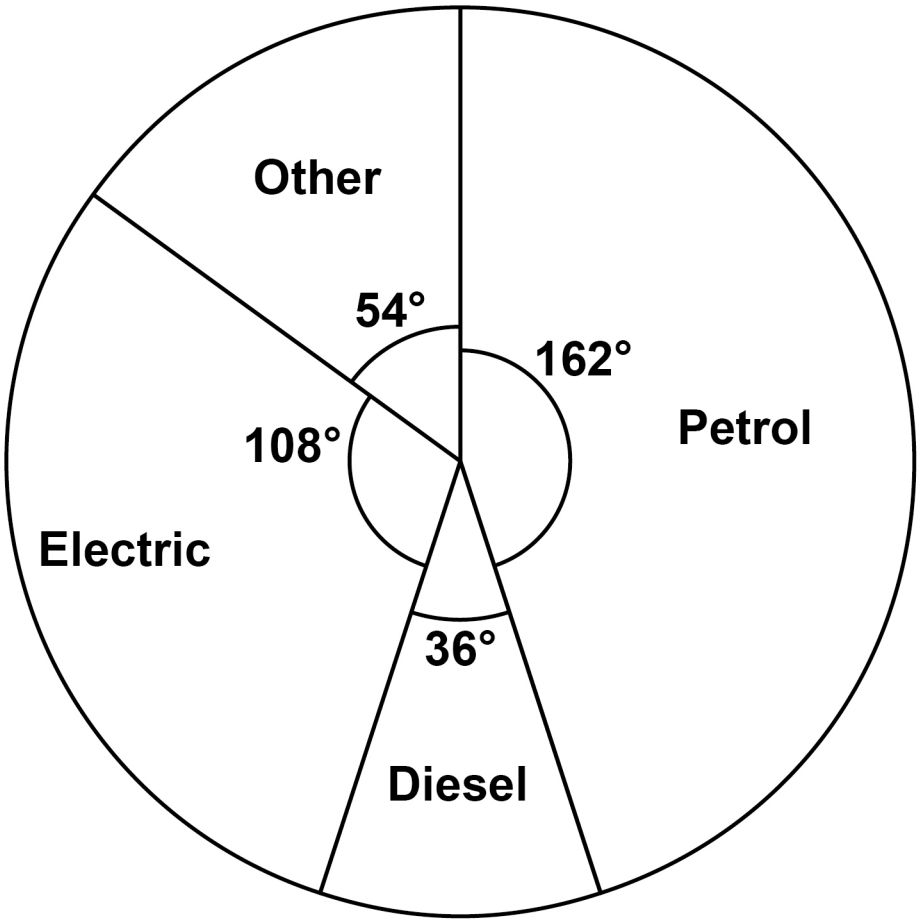
FUEL TYPE	NUMBER OF NEW CARS SOLD IN THE UK IN 2019
Petrol	1 478 400
Diesel	577 500
Electric	184 800
Other	69 300

Adapted from Statista and msn.com

In 2021 there were a total of 1 650 000 new cars sold in the UK.

Sita finds this pie chart about 2021, on the opposite page.

Fuel type of new cars sold in the UK in 2021



Source: Adapted from Statista and msn.com

[Turn over]

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Compare the number of new cars of each fuel type sold in 2019 with those sold in 2021.

In your answer you MUST give

- **calculations for the number of new cars of each fuel type sold in 2021**
- **comparisons with 2019.**

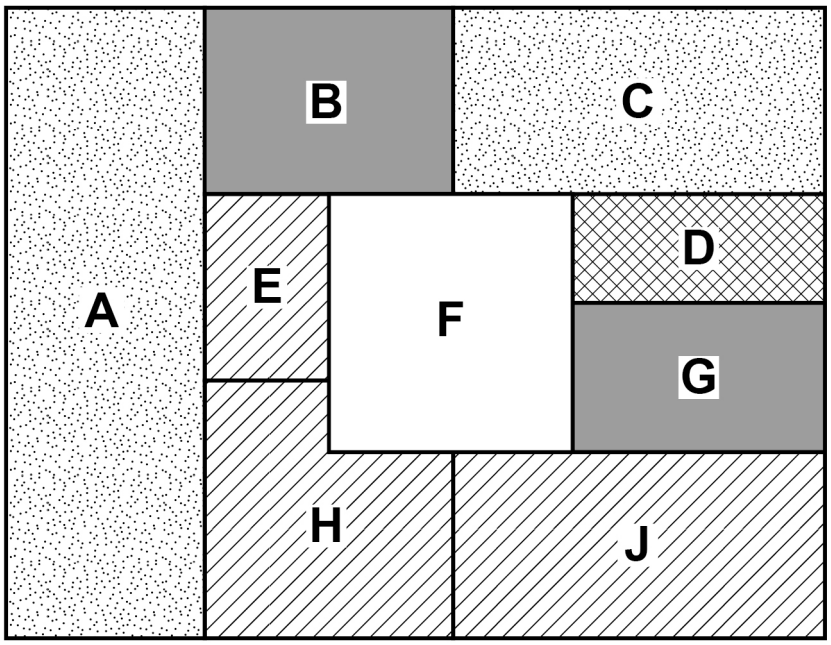
[7 marks]

[Turn over]

7

13 **A farmer rates how well crops grow in her nine fields.**

The choropleth map represents the fields on her farm and some of her ratings.



KEY

- Poor
- Satisfactory
- Good
- Excellent

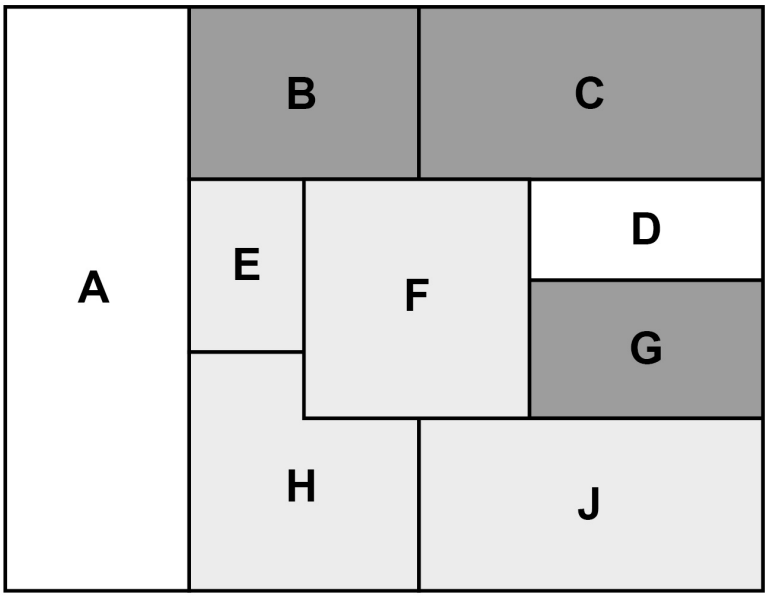
13 (a) **The farmer has the same number of fields rated good as are rated excellent.**

Complete field F on the choropleth map.
[1 mark]

[Turn over]

13 (b) **Here is a different choropleth map of the same nine fields.**

This map shows the amount of fertiliser the farmer used on each field.



KEY

Least fertiliser

Most fertiliser

The farmer makes the conclusion,

“The fields that had more fertiliser produced better quality crops.”

Comment on her conclusion by comparing the TWO choropleth maps, opposite and on page 48.

You should give a reason for and a reason against her conclusion. [2 marks]

Reason for _____

_____

_____

_____

_____

_____

Reason against _____

_____

_____

_____

_____

_____

13 (c) **Give ONE way the farmer could gain a greater amount of detail from the choropleth maps. [1 mark]**

13 (d) **Write down ONE possible extraneous variable. [1 mark]**

5

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[Turn over]

14 A type of fraud is when money is taken from you without your permission.

Money can be taken from your bank account, when shopping, or in other ways.

These frauds can take place online or offline.

The table shows data, in thousands, about some of these frauds that took place in 2020–2021.

	BANK ACCOUNT	SHOPPING	OTHER	TOTAL
ONLINE	809	853	240	1902
OFFLINE	1073	116	181	1370
TOTAL	1882	969	421	3272

Adapted from ONS

14 (a) One of these frauds is selected at random.

Write down the probability that it happened online. [1 mark]

Answer _____

14 (b) **Work out the probability that the fraud was NOT a bank account fraud. [2 marks]**

Answer _____

14 (c) **Work out the probability that it was a shopping fraud given that it happened offline. [2 marks]**

Answer _____

[Turn over]

5

15 Arne has produced a new fitness app.

He records the number of downloads per week, for 8 consecutive weeks.

WEEK	1	2	3	4	5	6	7	8
DOWNLOADS	500	520	580	600	680	720	600	840

15 (a) Arne says,

"520 people used the app in week 2."

Is he correct?

Tick (✓) a box, on the opposite page.

☐ Yes

☐ No

☐ Cannot tell

Give a reason for your answer. [1 mark]

15 (b) **Here are the data again, with some 4-point moving averages completed.**

WEEK	1	2	3	4	5	6	7	8
DOWNLOADS	500	520	580	600	680	720	600	840
MOVING AVERAGE			550	595	645	650		

Complete the table by calculating the missing 4-point moving average.
[2 marks]

58

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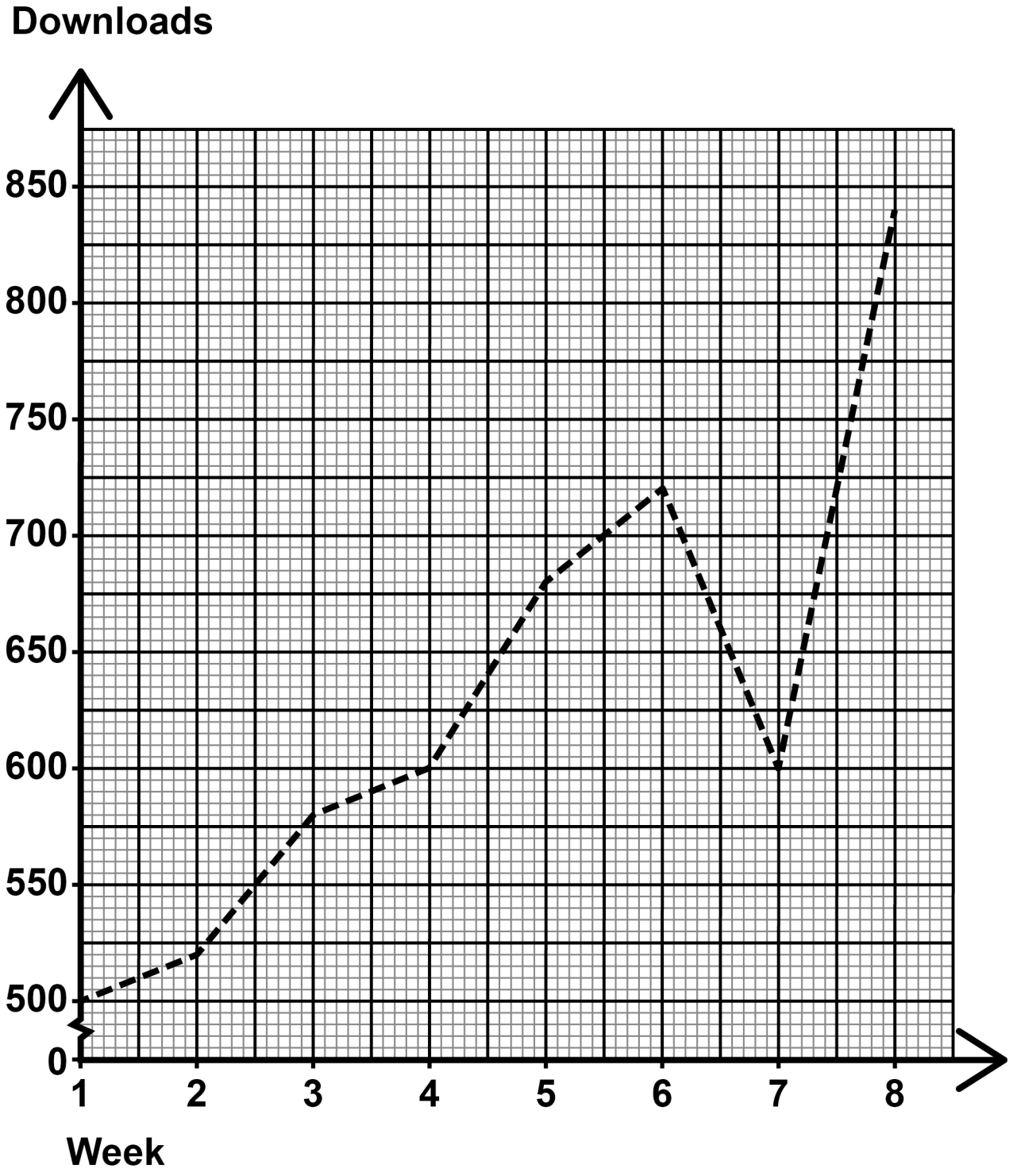
[Turn over]

15 (c) **The time series graph, on the opposite page, shows the data for the 8 weeks.**

Plot the 4-point moving averages, from page 58, AND draw the trend line, on the opposite page. [3 marks]

15 (d) **Describe the trend, in context. [1 mark]**



END OF QUESTIONS

7

Additional page, if required.

Write the question numbers in the left-hand margin.

Additional page, if required.

Write the question numbers in the left-hand margin.

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For Examiner's Use	
Question	Mark
1-4	
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7	
8	
9	
10	
11	
12	
13	
14	
15	
TOTAL	