



*Rewarding Learning*

**General Certificate of Secondary Education  
2024**

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## **Statistics**

Unit 2

Foundation Tier

**[GST21]**

**MONDAY 17 JUNE, AFTERNOON**

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**MARK  
SCHEME**

## General Marking Instructions

### Introduction

The mark scheme normally provides the most popular solution to each question. Other solutions given by candidates are evaluated and credit given as appropriate; these alternative methods are not usually illustrated in the published mark scheme.

The marks awarded for each question are shown in the right hand column and they are prefixed by the letters **M**, **A** and **MA** as appropriate. The key to the mark scheme is given below:

**M** indicates marks for correct method.

**A** indicates marks for accurate working, whether in calculation, readings from tables, graphs or answers.

**MA** indicates marks for combined method and accurate working.

The solution to a question gains marks for correct method and marks for an accurate working based on this method. Where the method is not correct no marks can be given.

A later part of a question may require a candidate to use an answer obtained from an earlier part of the same question. A candidate who gets the wrong answer to the earlier part and goes on to the later part is naturally unaware that the wrong data is being used and is actually undertaking the solution of a parallel problem from the point at which the error occurred. If such a candidate continues to apply correct method, then the candidate's individual working must be **followed through** from the error. If no further errors are made, then the candidate is penalised only for the initial error. Solutions containing two or more working or transcription errors are treated in the same way. This process is usually referred to as "follow-through marking" and allows a candidate to gain credit for that part of a solution which follows a working or transcription error.

It should be noted that where an error trivialises a question, or changes the nature of the skills being tested, then as a general rule, it would be the case that not more than half the marks for that question or part of that question would be awarded; in some cases the error may be such that no marks would be awarded.

### Positive marking

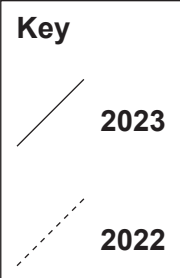
It is our intention to reward candidates for any demonstration of relevant knowledge, skills or understanding. For this reason we adopt a policy of **following through** their answers, that is, having penalised a candidate for an error, we mark the succeeding parts of the question using the candidate's value or answers and award marks accordingly.

Some common examples of this occur in the following cases:

- (a) a numerical error in one entry in a table of values might lead to several answers being incorrect, but these might not be essentially separate errors;
- (b) readings taken from candidates' inaccurate graphs may not agree with the answers expected but might be consistent with the graphs drawn.

When the candidate misreads a question in such a way as to make the question easier only a proportion of the marks will be available (based on the professional judgement of the examiner).

										AVAILABLE MARKS																																	
1	(a)	2010								A1																																	
	(b)	2019 and 2020								A1																																	
	(c)	7416 7574 7713 7794 7806 7819 7890 8022 8049 8095 8181 8235 8432 7890 GWh								M1 A1																																	
	(d)	8432 – 7416 = 1016 GWh								MA1																																	
	(e)	There was a decrease in consumption between 2013 and 2015 whereas, there was an increase in consumption between 2016 and 2018.								A1																																	
	(f)	The vertical axis starts at 4000 (i.e. not at zero) so the decrease looks larger than it actually is.								A2	8																																
2	(a)	52								A1																																	
	(b)	<table border="1"> <thead> <tr> <th></th> <th>Detached</th> <th>Semi-detached</th> <th>Terraced</th> <th>Apartment</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Oil</td> <td>52</td> <td>85</td> <td>24</td> <td>6</td> <td>167</td> </tr> <tr> <td>Gas</td> <td>27</td> <td>62</td> <td>54</td> <td>68</td> <td>211</td> </tr> <tr> <td>Electric</td> <td>8</td> <td>18</td> <td>12</td> <td>4</td> <td>42</td> </tr> <tr> <td>Total</td> <td>87</td> <td>165</td> <td>90</td> <td>78</td> <td>420</td> </tr> </tbody> </table>							Detached	Semi-detached	Terraced	Apartment	Total	Oil	52	85	24	6	167	Gas	27	62	54	68	211	Electric	8	18	12	4	42	Total	87	165	90	78	420					MA2	
	Detached	Semi-detached	Terraced	Apartment	Total																																						
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	(d)	Oil, electric								A1																																	
	(e)	$\frac{54}{211}$								MA2	7																																
3	(a)	These charts display proportions/fractions of the total.								A1																																	
	(b)	(i) No								A1																																	
		(ii) $2 \times 39$ is more than 61								MA1																																	
	(c)	There are a much larger number of houses than businesses but businesses (e.g. factories) may use a lot of electricity.								A2	5																																

			AVAILABLE MARKS
4	(a) Primary	A1	8
	(b) It is a biased/leading question as the sentence before it contains a negative statement about energy drinks.	A1	
	(c) Appropriate question Suitable response section	A1 A1	
	(d) The responses would take a long time to process.	A1	
	(e) All students in Year 12.	A1	
	(f) The results will be an accurate representation of the students as each person in Year 12 will have had the opportunity to be involved.	A1	
	(g) Any suitable difficulty, e.g. students being absent/unwilling to participate.	A1	
5	(a) Sampling frame.	A1	10
	(b) Cluster sampling.	A1	
	(c) Frequency polygon.	A1	
	(d) 	A1	
	(e) $0 \leq a < 500$	MA1	
	(f) In 2022 there were more households who spent larger amounts of money with mode at £1000–£1500. In 2023 most households spent less money with the mode at £0–£500.	A2	
	(g) The survey would be very expensive to carry out.	A1	
	(h) The results may not be reliable as some people may have been unwilling to respond or may not have been able to remember the correct amounts.	A2	
6	(a) 100	A1	6
	(b) The price has increased by 106.6% (or more than doubled) since 1987	A2	
	(c) (i) Between 2017 and 2022	A1	
	(ii) This period has the biggest difference in the index numbers.	A1	
(d) Time series graph/line graph	A1		

- 7 (a) 'Year 8s earn more merit points in Term 1 than Term 2' or other suitable hypothesis. A1
- (b) Median A1  
There is an outlier of 54 which will affect the mean but not the median A1
- (c) It could be unreliable as some pupils from one class may not represent the year group. A2

(d)

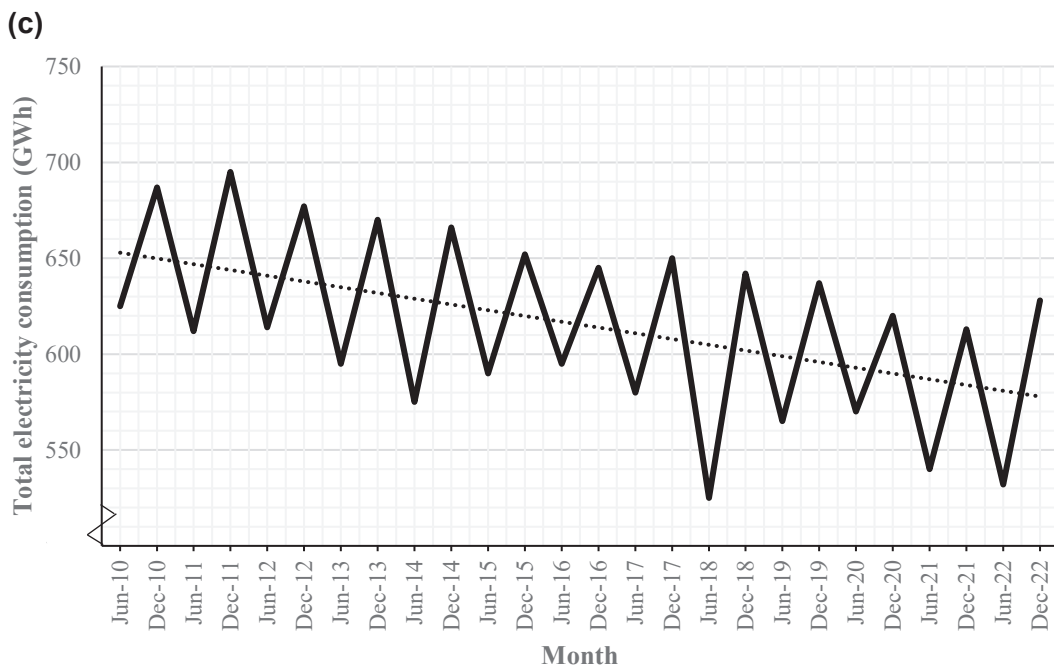
Term 1				Term 2						
			7	1	5	7	8	9		
6	6	3	3	2	0	2	2	3	4	6
5	3	2	0	3	0	1				
		5	2	4						
			4	5						

Key 7 | 1 = 17

Key 1 | 5 = 15

MA3 A2

- (e) (i) Yes A1
- (ii) More students were in the 30s and above in Term 1. A1
- (f) (i) No change A1
- (ii) No change A1
- (iii) Increase A1
- 8 (a) A time series is a set of measurements of a variable which have been taken at intervals of time. A2
- (b) June 2018 A1



A1

15

