



Rewarding Learning

**General Certificate of Secondary Education
2024**

Statistics

Unit 1
Calculator Paper
Foundation Tier

[GST11]

TUESDAY 11 JUNE, AFTERNOON

**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)

Season	Tally	Frequency
Spring		3
Summer	/ / / /	14
Autumn	/	8
Winter		2

A1

(b) **KEY** ☺ represents 2 people

Spring	☺ ☺
Summer	☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺
Autumn	☺ ☺ ☺ ☺
Winter	☺

M1 A2

(c) The symbol ✓ is not symmetrical so it could not be used to represent the odd number for Spring.

A2

6

2 The hair colour in cell A8 is recorded as 'B' and not a colour.

A1

The eye colour in cell B5 is missing.

A1

The height in cell C3 has been recorded as 15.1 m which is unrealistic.

A1

3

3 (a) 44

A1

$$\begin{aligned}
 \text{(b) Mean} &= \frac{9 + 12 + 11 + 8 + 11 + 13 + 8 + 9 + 11 + 10}{10} \\
 &= \frac{102}{10} \\
 &= 10.2 \text{ minutes}
 \end{aligned}$$

MA1

A1

$$\begin{aligned}
 \text{(c) Range} &= 13 - 8 \\
 &= 5
 \end{aligned}$$

MA1

(d) The mean time for both brothers was 10.2 minutes so, on average, they take the same amount of time to wash a car.

A2

The range for Adam was 5 minutes which was greater than Callum's range of 3 minutes, so Adam's times showed more variation than Callum's.

A2

8

AVAILABLE
MARKS

			AVAILABLE MARKS	
4	(a) Scatter diagram.	A1	5	
	(b) Preparation time.	A1		
	(c) Negative correlation.	A1		
	(d) Bivariate data	A1		
	(e) -0.820	A1		
5	(a) No timeframe. There is no option for not using social media at all. A lot/quite a bit/regularly could be interpreted differently.	A1 A1 A1	5	
	(b) Interviewing the students would probably give a better response rate as many may choose not to respond to a questionnaire. Additional information can be collected during an interview which cannot be done with a questionnaire.	A1 A1		
	6	(a) 'Train passengers are more likely to buy a return ticket than a single ticket', or any acceptable alternative.		A1
		(b) Primary, categorical.		A2
(c) Individual frequencies are not as important as the frequencies compared to each other. A compound bar chart is an appropriate representation of this as it shows proportions rather than frequencies.		A2		
(d) Single tickets: $\frac{6}{24} \times 100 = 25\%$ Return tickets: 75%	MA1	13		
			A2	
(e) About one quarter of passengers had a single ticket/about three times as many passengers had a return ticket than a single ticket.	A1			
(f) Train passengers are more likely to travel on a return ticket than a single ticket.	A1			
(g) Cluster sampling.	A1			
(h) Margaret has not specified any particular category of passenger, but the passengers at the train station at 6:30 am are likely to be commuters so may not be representative of train passengers in general.	A2			

7 (a)

	Domestic	International	TOTAL	
On time	518	2261	2779	
Delayed	76	255	331	
TOTAL	594	2516	3110	A3

(b) (i) Risk = $\frac{255}{2516} = 0.1014$ MA1 A1

(ii) $0.1014 \times 100 = 10.14\%$ MA1

(iii) $10.14\% = 1 \text{ in } 10$ MA2

(c) No. of delayed flights = 0.07×3141 M1 MA1
 $= 219.87$
 $= 220$ A1

11

8 (a) $q = 1 - (0.27 + 0.14 + 0.42)$ M1
 $= 1 - 0.83$
 $= 0.17$ A1

(b) P(not full-time) = $1 - (0.27 + 0.14)$ M1
 $= 1 - 0.41$
 $= 0.59$ A1

(c) The probability that a randomly selected person works at home full-time is 0.14 A2

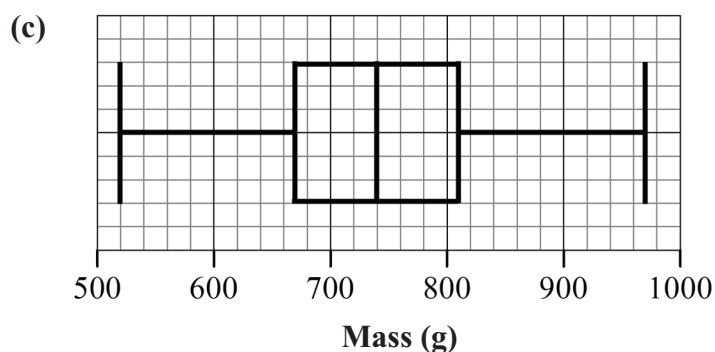
(d) $P(H) = 0.14 + 0.42 = 0.56$ MA1
Expected number = 0.56×150 M1
 $= 84$ A1

9

9 (a) 60 A1

(b) (i) 740 g MA1

(ii) IQR = $810 - 670$ MA1
 $= 140 \text{ g}$ A1



MA2 A2

(d) The box plot is fairly symmetrical so a normal distribution model might be appropriate. A2

10

10 (a) Secondary, quantitative	A2	AVAILABLE MARKS
(b) (i) Decrease	A1	
(ii) The index number is less than 100	A1	
(c) Cost in 2023 = $53 \times \frac{113.2}{100}$ = £60	M1 MA1 A1	
(d) Index number for 2021 = $\frac{54}{53} \times 100$ = 101.9	M1 MA1 A1	10
	Total	80