



*Rewarding Learning*

**General Certificate of Secondary Education  
2025**

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**Statistics**

Unit 2

Higher Tier

[GST22]

**THURSDAY 19 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

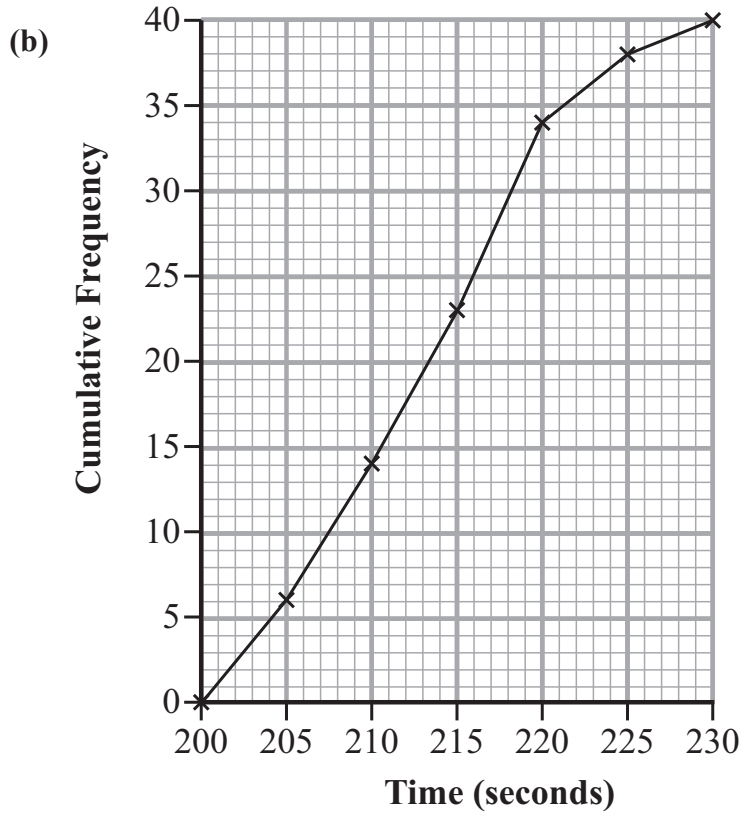
It is our intention to reward candidates for any demonstration of relevant knowledge, skills or understanding. For this reason we adopt a policy of **following through** their answers, that is, having penalised a candidate for an error, we mark the succeeding parts of the question using the candidate's 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) 90%	A1																						
	(b) The proportions of younger males and females with a full car driving licence are approximately equal. After this, there is a gradual decline in the proportion of females with a full car driving licence whereas the decline for males only begins from age 79.	A1 A1																						
	(c) Men are more likely to work as drivers so keep their licences for longer.	A1	4																					
2	40% is missing from the scale on the horizontal axis. The data for Larne is missing. The 'overall' bar is incorrect as its value is significantly less than the other values.	A1 A1 A1	3																					
3	(a) Suitable hypothesis	A1																						
	(b) Appropriate data for at least 2014 and 2024	A2																						
	(c) (i) Secondary (ii) appropriate justification	A2																						
	(d) Source identified, e.g. NISRA or DVA	A1																						
	(e) Possible diagram with appropriate justification	A2	8																					
4	(a)																							
	<table border="1"> <thead> <tr> <th>Time, <math>t</math> (secs)</th> <th>Frequency</th> <th>Cumulative Frequency</th> </tr> </thead> <tbody> <tr> <td><math>200 \leq t &lt; 205</math></td> <td>6</td> <td>6</td> </tr> <tr> <td><math>205 \leq t &lt; 210</math></td> <td>8</td> <td>14</td> </tr> <tr> <td><math>210 \leq t &lt; 215</math></td> <td>9</td> <td>23</td> </tr> <tr> <td><math>215 \leq t &lt; 220</math></td> <td>11</td> <td>34</td> </tr> <tr> <td><math>220 \leq t &lt; 225</math></td> <td>4</td> <td>38</td> </tr> <tr> <td><math>225 \leq t &lt; 230</math></td> <td>2</td> <td>40</td> </tr> </tbody> </table>	Time, $t$ (secs)	Frequency	Cumulative Frequency	$200 \leq t < 205$	6	6	$205 \leq t < 210$	8	14	$210 \leq t < 215$	9	23	$215 \leq t < 220$	11	34	$220 \leq t < 225$	4	38	$225 \leq t < 230$	2	40		
Time, $t$ (secs)	Frequency	Cumulative Frequency																						
$200 \leq t < 205$	6	6																						
$205 \leq t < 210$	8	14																						
$210 \leq t < 215$	9	23																						
$215 \leq t < 220$	11	34																						
$220 \leq t < 225$	4	38																						
$225 \leq t < 230$	2	40																						
		MA2																						



A3

(c) (i) 213 seconds

MA1

(ii)  $218 - 207.5 = 10.5$  seconds

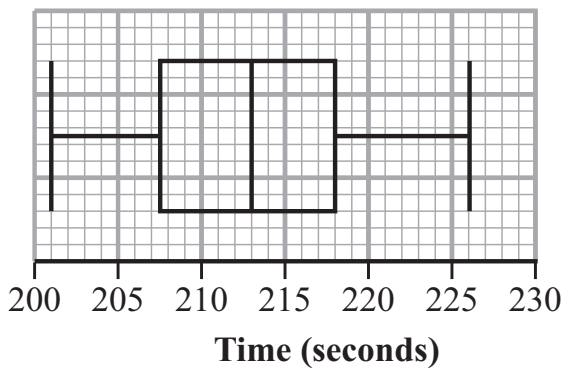
MA1 A1

(d) 9 people

MA1

(e) Largest value =  $201 + 25 = 226$  seconds

MA1



MA3

(f) Normal distribution  
The box plot is roughly symmetrical

A1

A1

15

Mass ( <i>m</i> ) kg	Frequency, <i>f</i>	<i>m</i>	<i>mf</i>
0.5–1.0	2	0.75	1.5
1.0–1.5	4	1.25	5
1.5–2.0	6	1.75	10.5
2.0–2.5	5	2.25	11.25
2.5–3.0	3	2.75	8.25
<b>Totals</b>	<b>20</b>		<b>36.5</b>

MA2

$$\text{Mean} = \frac{36.5}{20}$$

M1

$$= 1.825 \text{ kg}$$

A1

(b) (i) No difference

A1

(ii) The mass would still be in the same interval so the frequency would not change in any of the groups.

A1

6

6 (a) Angle = 73°

A1

$$\begin{aligned} \text{No. of cars that failed} &= \frac{73}{360} \times 281 \\ &= 57 \end{aligned}$$

M1

A1

(b) No. of cars that failed =  $\frac{215}{306} \times (360 - 306)$   
= 38

MA1

A1

(c)

$$\frac{r^2}{f} = \frac{R^2}{F}$$

$$\frac{r^2}{215 + 38} = \frac{4^2}{281}$$

M1 MA1

$$r^2 = 14.40569\dots$$

$$r = 3.8 \text{ cm (1 d.p.)}$$

A1

8

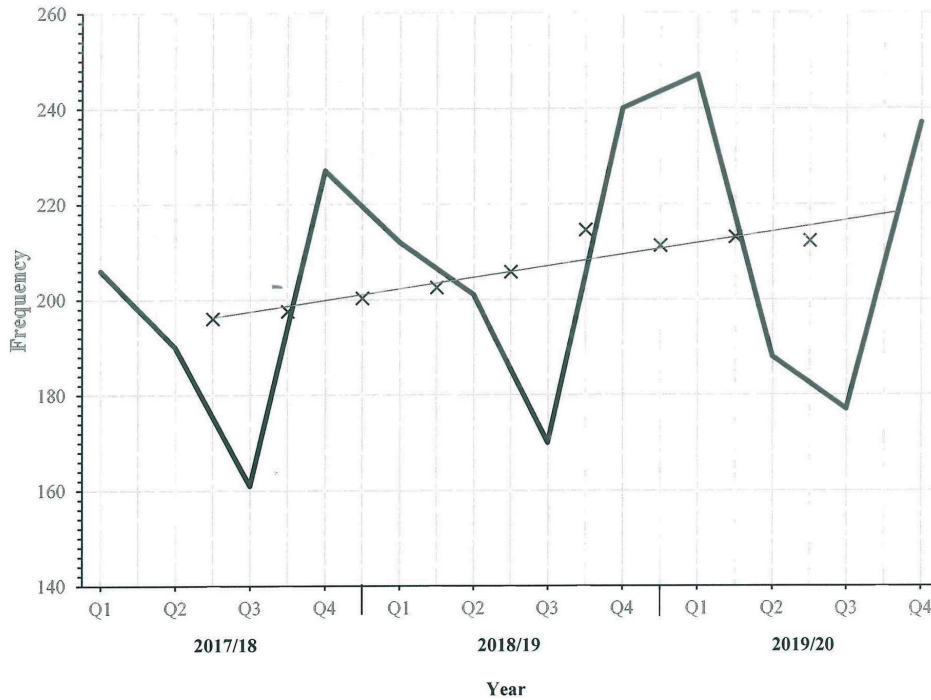
7 (a)  $\frac{240 + 247 + 188 + 177}{4} = 213$

MA1

$\frac{247 + 188 + 177 + 237}{4} = 212$

MA1

(b)



MA3

(c) (i)  $\frac{188 + 177 + 237 + x}{4} = 218$

MA1 A1

$x = 270$

A1

(ii) The increasing trend continues.

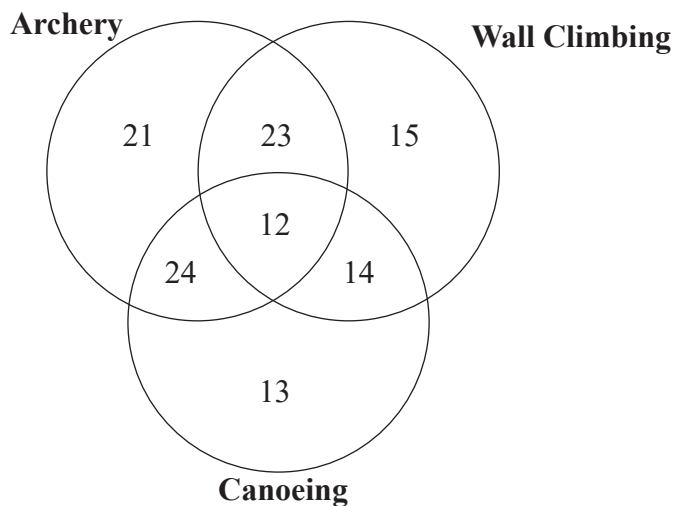
A1

9

8 (a) A Venn diagram is appropriate as the categories overlap each other.

A1

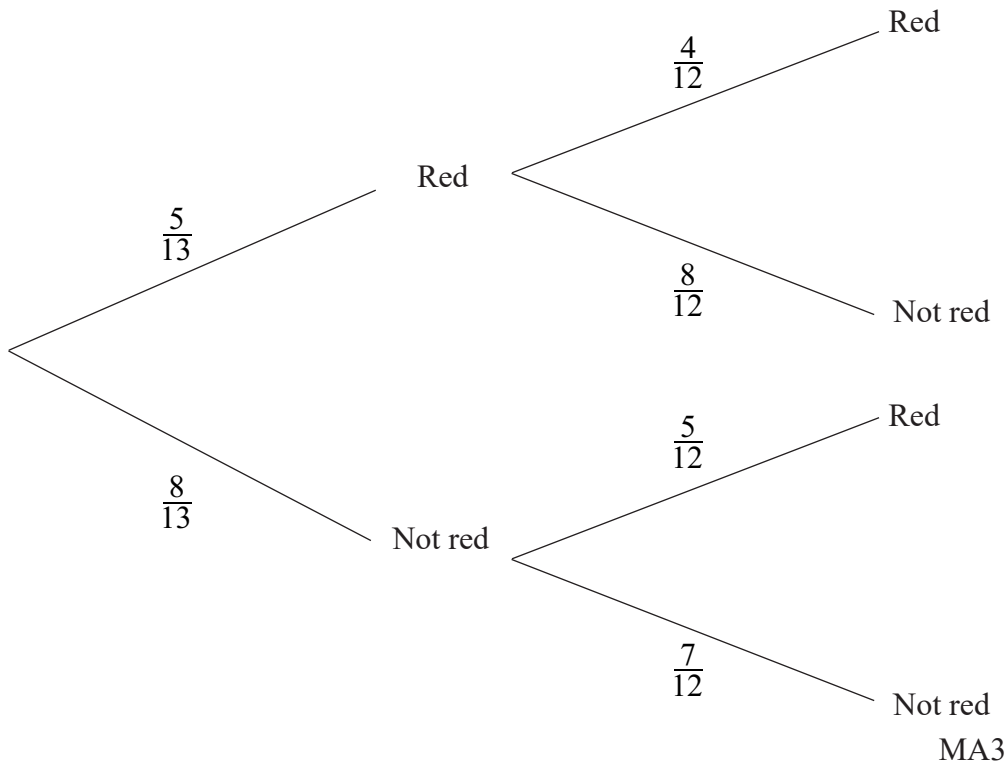
(b)



A3

			AVAILABLE MARKS
(c) (i)	$P(\text{two activities}) = \frac{23 + 14 + 24}{21 + 23 + 15 + 24 + 12 + 14 + 13}$	M1	
	$= \frac{61}{122}$		
	$= \frac{1}{2}$	A1	
(ii)	$P(W C) = \frac{12 + 14}{12 + 14 + 24 + 13}$	MA1	
	$= \frac{26}{63}$	A1	
(d) (i)	No. of Year 8 pupils $= \frac{21 + 23 + 24 + 12}{122} \times 28$	MA2	
	$= 18.3606\dots$		
	$= 18 \text{ pupils}$	A1	
(ii)	The result may not be reliable as the interests of the Year 8 pupils may differ from the interests of the Year 13 pupils.	A2	13
9	(a) 100	A1	
	(b) The cost of a driving lesson increased by 8.3% between 2021 and 2022	A3	
	(c) $26 \times 1.039 = 27.014$ $= \text{£}27$	MA1 A1	
	(d) $GM = \sqrt[3]{108.3 \times 103.9 \times 107.4}$ $= 106.5$	M1 A1	
	(e) The average increase in the cost of a driving lesson was 6.5% between 2022 and 2024.	A2	

10 (a)



AVAILABLE  
MARKS

(b) (i) 
$$P(\text{two red}) = \frac{5}{13} \times \frac{4}{12}$$

$$= \frac{5}{39}$$
MA1  
A1

(ii) 
$$P(\text{at least one red}) = 1 - P(\text{no red})$$

$$= 1 - \left(\frac{8}{13} \times \frac{7}{12}\right)$$

$$= \frac{25}{39}$$
M1  
MA1  
A1

(iii) 
$$P(\text{both red} \mid \text{at least one red}) = \frac{\frac{5}{13} \times \frac{4}{12}}{\frac{25}{39}}$$

$$= \frac{1}{5}$$
M1 MA1  
A1

11 (a) 
$$\text{Risk} = \frac{4+5}{4+5+2+13}$$

$$= \frac{3}{8}$$
MA1  
A1

(b) (i) Risk (late for school relative to missing the bus)

$$= \frac{\text{Risk(late for school)}}{\text{Risk(missing the bus)}}$$

$$= \frac{\frac{3}{8}}{\frac{2}{24}}$$

$$= 1\frac{1}{2}$$
M1  
MA1  
A1

(ii) A pupil in this class is 1.5 times more likely to be late for school if they missed the bus compared to if they didn't miss the bus. A2

11

(c)  $P(\text{not late}) = 1 - 0.19 = 0.81$

MA1

(d) (i)  $L = \text{No. of days Chloe is late for school, so } L \sim \text{Bin}(5, 0.19)$

$$\begin{aligned} P(L = 0) &= q^5 \\ &= 0.81^5 \\ &= 0.349 \end{aligned}$$

M1  
A1

(ii)  $P(L < 3) = P(L = 0, 1 \text{ or } 2)$   
 $= q^5 + 5pq^4 + 10p^2q^3$   
 $= (0.81)^5 + 5(0.19)(0.81)^4 + 10(0.19)^2(0.81)^3$   
 $= 0.949$

M1  
MA1  
A1

**Total**

AVAILABLE  
MARKS

13

**100**