



Rewarding Learning

**General Certificate of Secondary Education
2022**

Statistics

Unit 1

Foundation Tier

[GST11]

TUESDAY 14 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)

COVID-19 Context

Given the unprecedented circumstances presented by the COVID-19 public health crisis, senior examiners, under the instruction of CCEA awarding organisation, are required to train assistant examiners to apply the mark scheme in case of disrupted learning and lost teaching time. The interpretation and intended application of the mark scheme for this examination series will be communicated through the standardising meeting by the Chief or Principal Examiner and will be monitored through the supervision period. This paragraph will apply to examination series in 2021–2022 only.

- 1 (a) 3 A1
- (b) (i) Red. A1
- (ii) It is represented by the longest bar. A1
- (c) $6 + 12 + 3 + 2 + 7$
 $= 30$ M1
A1
- (d) Qualitative. A1
- 2 (a) Mean = $\frac{34 + 61 + 55 + 48 + 52}{5}$ MA1
 $= 50$ A1
- (b) (i) Increase. A1
- (ii) The total score has increased. A1
- (c) Each value occurs just once so there is no mode. A2

3 (a)

Number of goals	Tally	Frequency	Total
0		9	0
1		9	9
2		3	6
3		3	9

A2

- (b) Mean = $\frac{0 + 9 + 6 + 9}{9 + 9 + 3 + 3}$ M1 MA1
 $= 1$ A1
- (c) Bill might be a better coach because the average number of goals was higher while he was the manager. A2
- (d) (i) Phil's. A1
- (ii) Phil's mean was based on a larger number of matches. A1

AVAILABLE MARKS	
6	
6	
9	

- 4 The vertical axis does not start at zero.
 There is only one label on the vertical axis so the scale cannot be determined.
 The bar for 2015 is unusually wide.
 The label for 2010 is incorrect.

A1

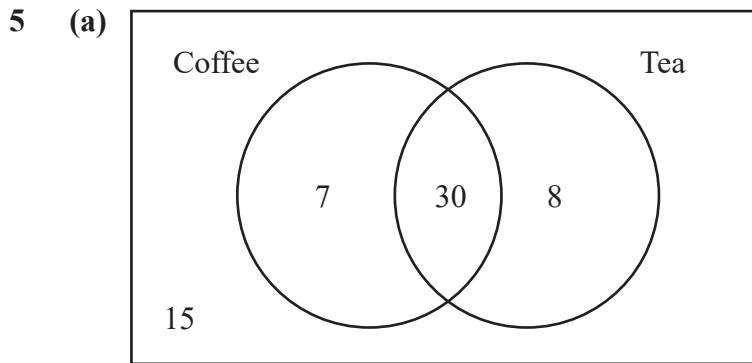
A1

A1

A1

AVAILABLE
MARKS

4



A5

(b) 8

A1

(c)
$$P(C \text{ or } T) = \frac{7 + 30 + 8}{60}$$

$$= \frac{3}{4}$$

M1 MA1

A1

9

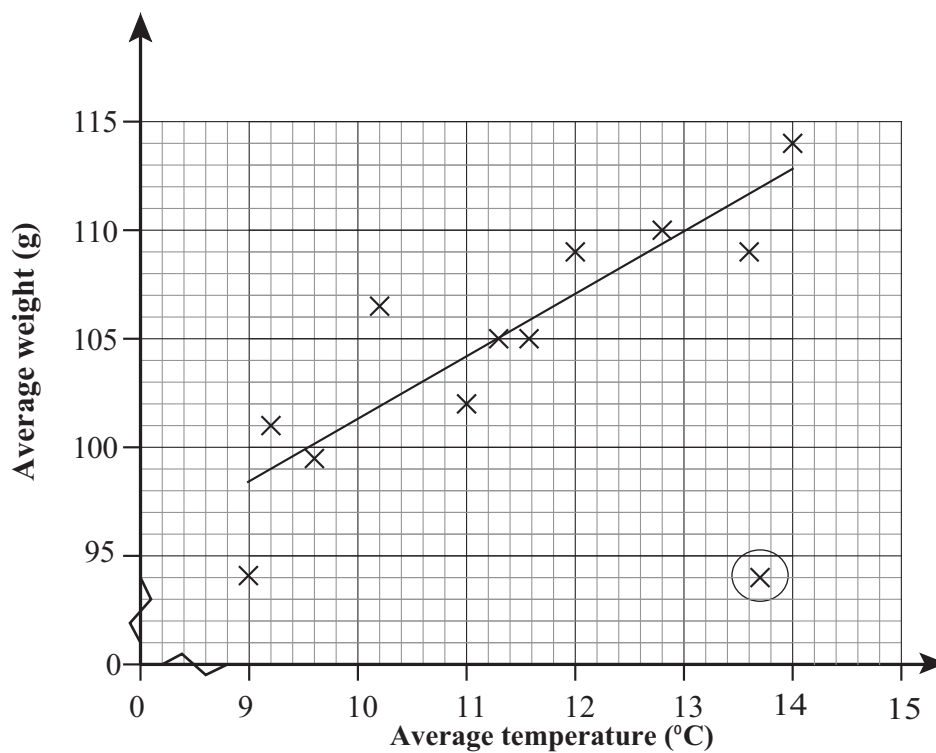
6 (a) Scatter diagram

A1

(b) Average temperature

A1

(c)



A1

(d) See diagram

A2

(e) Positive correlation

A1

(f) (i) 109 g

MA1

(ii) 10.2°C

Or corresponding values from candidate's own diagram

MA1

8

7 (a)

Height, h (cm)	Frequency
$125 \leq h < 130$	3
$130 \leq h < 135$	7
$135 \leq h < 140$	12
$140 \leq h < 145$	6
$145 \leq h < 150$	2

A4

(b) $12 + 6 + 2$
 $= 20$

MA1

A1

(c) The data is grouped so there is no way of telling what the minimum and maximum heights are.

A2

8

8 (a) $\frac{1}{5}$

MA1

(b) The probabilities would not be equal.

A1

(c)

Score	1	2	3	4	5
Frequency	55	54	53	83	55
Estimated probability	0.183	0.18	0.177	0.277	0.183

MA3

(d) The spinner is biased towards 4 because the estimated probability is much greater than the others.

A2

The estimated probabilities for the four other outcomes are approximately equal so Roy could assume that they are equally likely.

A2

9

AVAILABLE
MARKS

9 (a) Quantitative
Continuous

A1
A1

(b)

Time, t (hours)	Frequency	Cumulative frequency
$0 \leq t < 2$	4	4
$2 \leq t < 4$	5	9
$4 \leq t < 6$	18	27
$6 \leq t < 8$	8	35
$8 \leq t < 10$	5	40

MA1 A1

(c) 40

A1

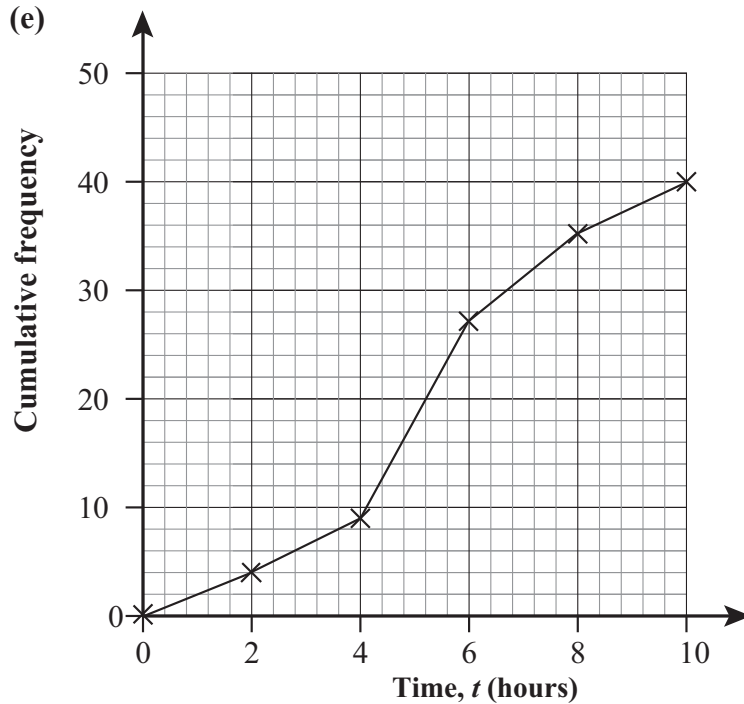
(d) (i) $4 \leq t < 6$

A1

(ii) $4 \leq t < 6$

A1

(e)



MA2
A1

(f) Easier to identify the total frequency without calculation.
Median and quartiles can be found easily.

A1
A1

(g) The distribution of times can be seen more easily OR it is easier to identify the modal class.

A1

AVAILABLE
MARKS

13

10 (a) The price of one litre of diesel increased by 5.6% between 2016 and 2018

(b) $\frac{122.9}{114.6} \times 100$
= 107.2425...
= 107.2

(c) 1.125×114.6
= 128.9p

A3
M1 MA1

A1

MA1
A1

Total

AVAILABLE
MARKS

8

80