



Rewarding Learning

**General Certificate of Secondary Education
November 2021**

Mathematics

M1

(With calculator)

Foundation Tier

[GMC11]

MONDAY 29 NOVEMBER, MORNING

**MARK
SCHEME**

GCSE MATHEMATICS

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 solution to a question gains marks for correct method and marks for accurate working based on this method. 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. Accuracy marks may depend on preceding **M** (method) marks, hence **M0 A1** cannot be awarded i.e. where the method is not correct no marks can be given.

MA indicates marks for combined method and accurate working.

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 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).

General Marking Advice

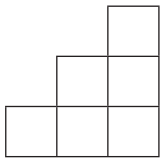
- (i) If the correct answer is seen in the body of the script and the answer given in the answer line is clearly a transcription error, full marks should be awarded.
- (ii) If the answer is missing, but the correct answer is seen in the body of the script, full marks should be awarded.
- (iii) If the correct answer is seen in working but a completely different answer is seen in the answer space, then some marks will be awarded depending on the severity of the error.
- (iv) Work crossed out but not replaced should be marked.
- (v) In general, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered (with no solution offered on the answer line), mark the poorest answer.
- (vi) For methods not provided for in the mark scheme, give as far as possible equivalent marks for equivalent work.
- (vii) Where a follow through mark is indicated on the mark scheme for a particular part question, the marker must ensure that you refer back to the answer of the previous part of the question.
- (viii) Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures seen, e.g. the answer in the mark scheme is 4.65 and the candidate then correctly rounds to 4.7 or 5 on the answer line. Allow full marks for 4.65 seen in the working.
- (ix) Anything in the mark scheme which is in brackets (...) is not required for the mark to be earned, but if present it must be correct.
- (x) For any question, the range of answers given in the mark scheme is inclusive.

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.

			AVAILABLE MARKS																																
1	Two thousand seven hundred	2 700	A1																																
	Twenty thousand seven hundred	20 700	A1																																
	Two million and seventy	2 000 070	A1																																
2	(a) 9.2 – 9.7		A1																																
	(b) 7:40 or 20 to 8		A1																																
	(c) 2 hours 15 minutes		A1																																
3	(a) (i) USA		A1																																
	(ii) UK		A1																																
	(iii) 335 – 345		A1																																
	(b) (i) Plastic bag should be 70 years, not 90 or 3½ symbols should be drawn or 1 symbol too many		A1																																
	(ii) Too many symbols needed (50 000)		A1																																
4	(a) 60 + 60 + 60 + 30 + 30 + 30 + 50 + 50 + 35 £4.05		MA1 A1																																
	(b) 55p or £0.55		A1																																
5	(a) E		A1																																
	(b) G		A1																																
	(c) D		A1																																
6	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Area</th> <th style="text-align: center;">Capacity</th> <th style="text-align: center;">Length</th> <th style="text-align: center;">Mass</th> </tr> </thead> <tbody> <tr> <td>milligrams</td> <td></td> <td></td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td>square metres</td> <td style="text-align: center;">✓</td> <td></td> <td></td> <td></td> </tr> <tr> <td>tonnes</td> <td></td> <td></td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td>litres</td> <td></td> <td style="text-align: center;">✓</td> <td></td> <td></td> </tr> <tr> <td>kilometres</td> <td></td> <td></td> <td style="text-align: center;">✓</td> <td></td> </tr> </tbody> </table>					Area	Capacity	Length	Mass	milligrams				✓	square metres	✓				tonnes				✓	litres		✓			kilometres			✓		
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(allow [2] for 4 correct, [1] for 2 or 3 correct)			A3																																
7	(a) 2 × 17 = 34 44		MA1 A1																																
	(b) Yes because he still gets £10		A1																																
			3																																

			AVAILABLE MARKS
8	3147	A3	3
	allow 3, 6 or 9 in first box	A1	
	1, 3 or 5 in second box (3 not allowed if it was used in first box) third and fourth digits correctly followed	A1 A1	
9	(a) 37	A1	5
	(b) $165 \div 6$ 27.5	M1 A1 A1	
	(c) 25.5	A1	
10	(a) -570, -190, 65, 230, 460 (or Jonny, Jason, Sara, Bernie, Wendy)	A2	4
	(b) -70	A1	
	(c) 800	A1	
11	(a) Propeller	A1	3
	(b) Anchor	A1	
	(c) Lifebuoy and Wheel	A1	
12	(a) evidence of 40% or 0.4 Yes because 40% is greater than 35%	MA1 A1	4
	(b) 15×4 60	MA1 A1	
13	$26 \times 45.50 = 1183$ $1183 + 300 = 1483$	M1 A1 MA1	3
14	(a) $(2 \times 4) + (2 \times 2.5)$ 13	MA1 A1	5
	(b) $19.9 - 12.2 = 7.7$ or $19.9 = 2 \times 6.1 + 2w$ or $19.9 = 12.2 + 2w$ $7.7 \div 2$ or $7.7 = 2w$ 3.85	MA1 MA1 A1	
15	(a) 15	A1	
	(b) $5 \times 2 \times 3$ 30	M1 A1	3

		AVAILABLE MARKS	
16	$200 - (3 \times 16.75) = 149.75$ $149.75 \div 12.30 = 12.17.....$ 12	MA1 MA1 A1	3
17	(a) $180 - 90 - 64$ or $90 - 64$ $= 26$ (b) $180 - 26 = 154$ $\frac{180 - 154}{2}$ $= 13$	M1 A1 MA1 M1 A1	5
18	$11 \times 4.30 = 47.30$ $66.55 - 47.30 = 19.25$ $19.25 \div 7$ 2.75	MA1 MA1 MA1 A1	4
19	(a) Correct side elevation  (b) 16	A2 A1	3
20	3 outside circles 4 in overlap 2 in Music only	A1 A1 A1	3
21	40 people = 360° so 1 person = 9° $45^\circ = 5$ people and $108^\circ = 12$ people $5 + 12 + 7 + 10 = 34$ people 6 people = 54° alternative solution 40 people = 360° so 1 person = 9° 7 people = 63° and 10 people = 90° $63 + 90 + 45 + 108 = 306^\circ$ $360 - 306 = 54^\circ$	MA1 MA1 MA1 MA1 MA1 MA1 MA1 MA1	4
22	$28 \times 22 = 616$ $\pi \times 8^2$ $= 201.06(19298)$ $616 - 201.06 = 414.94\text{m}^2$	MA1 M1 A1 A1 A1 (units)	5

		AVAILABLE MARKS
23	(a) $12t - 20$	A1
	(b) $3(6w + 7)$	A1
24	(a) 15% of 75 = 11.25 $75 - 11.25$ 63.75	MA1 MA1 A1
	(b) 20% of 63.75 = 12.75 $63.75 - 12.75 = 51$	MA1 A1
	(c) 35% of 75 = 26.25 or $75 - 26.25 = 48.75$ No, not equal to 51	MA1 A1
25	(a) data is not in order	A1
	(b) $\begin{array}{l l} 0.3 & 2\ 6\ 9 \\ 0.4 & 3\ 8\ 9 \\ 0.5 & 1\ 2\ 2\ 4\ 4 \\ 0.6 & 0\ 2\ 4\ 8 \end{array}$	A2
	(c) data is now in order [data is easier to read or other correct alternatives]	A1
	(d) 0.52	A1
26	attempt to change to common denominator and add	MA1
	$\frac{2}{5} + \frac{1}{4} + \frac{3}{20} = \frac{16}{20}$ or equivalent	A1
	$1 - \frac{16}{20} = \frac{4}{20}$ or $\frac{1}{5}$ or equivalent	A1
	alternative solution	
	$\frac{2}{5}$ of 400 = 160 $\frac{1}{4}$ of 400 = 100 $\frac{3}{20}$ of 400 = 60	MA1
	$160 + 100 + 60 = 320$ $400 - 320 = 80$	MA1
	$\frac{80}{400}$ or equivalent	A1
27	any class correctly changed to a percentage	MA1
	85% 87.5% 86.36% (accept decimals)	MA1
	B	A1
Total		100

