Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education (9–1)

MATHEMATICS **0626/03**

Paper 3 **October/November 2019**

MARK SCHEME

Maximum Mark: 84

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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MARK SCHEME NOTES

The following notes are intended to aid interpretation of mark schemes in general, but individual mark schemes may include marks awarded for specific reasons outside the scope of these notes.

Types of mark

M Method marks, awarded for a valid method applied to the problem.

A Accuracy mark, awarded for a correct answer or intermediate step correctly obtained. For accuracy marks to be given, the associated Method mark must be earned or implied.

B Mark for a correct result or statement independent of Method marks.

When a part of a question has two or more 'method' steps, the M marks are in principle independent unless the scheme specifically says otherwise; and similarly where there are several B marks allocated. The notation '**dep**' is used to indicate that a particular M or B mark is dependent on an earlier mark in the scheme.

Abbreviations

awrt answers which round to
cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
nfww not from wrong working
oe or equivalent
rot rounded or truncated
SC Special Case
soi seen or implied

Question	Answer	Marks	Partial Marks
1(a)	14.8	**1**	
1(b)	10	**1**	
2	46	**2**	**M1** for [69 –] $\frac{69}{3}$ or $69\times\frac{2}{3}$ or **B1** for 23 seen
3(a)	7	**2**	**M1** for $\frac{3(6)-4}{2}$ oe
3(b)	22	**2**	**M1** for 5(2) – 3(–4) oe
4(a)	Cross at 0	**1**	
4(b)	Cross at 0.3	**1**	
5(a)	85	**1**	

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Question	Answer	Marks	Partial Marks
5(b)	70	**2**	**M1** for $\left[90-\right]\ \frac{180-140}{2}$ or $\frac{1}{2}\times 140$ or **B1** for 20 seen
6(a)	21 000	**1**	
6(b)(i)	Valid explanation	**1**	
6(b)(ii)	430 000	**1**	
7(a)	–126	**2**	**B1** for –21 seen or **M1** for *their* –21 × 6
7(b)	17	**2**	**B1** for [30 ÷ 6 =] 5 or **M1** for ÷ 6 and + 12 soi
8(a)	25	**1**	
8(b)	1145	**2**	**B1** for the T1 service at 1157 identified
9	140	**3**	**M2** for $365-\frac{150}{2}\times 3$ or 225 seen or **M1** for $\frac{150}{2}\times 3$ or for 75 seen
	Valid assumption	**1**	
10(a)	$\begin{pmatrix}12\\10\end{pmatrix}$	**1**	
10(b)	$\begin{pmatrix}3\\-7\end{pmatrix}$	**2**	**B1** for each component or for [2**p** =] $\begin{pmatrix}10\\2\end{pmatrix}$ seen
11	21.85	**3**	**B1** for 19 **M1** for 15% of *their* 19 soi e.g. $\frac{19}{10}+\frac{19}{20}$ **M1 FT** for *their* 19 + 15% of *their* 19 **Maximum 2 marks if answer incorrect**
12(a)	7	**1**	
12(b)	10	**1**	
12(c)	Before with valid explanation	**1**	
13(a)	Correct reflection with vertices at (1, 4), (3, 4), (2, 6)	**1**	

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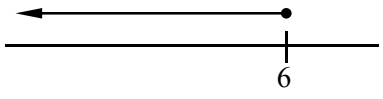
Question	Answer	Marks	Partial Marks
13(b)	Correct translation with vertices at (–4, –4), (–5, –2), (–3, –2)	**2**	**M1** for correct x move or correct y move or **SC1** for translation $\begin{pmatrix}-4\\-6\end{pmatrix}$
14	7584	**3**	**M2** for attempting 48 × 158 or 12 × 632 or 4 × 1896 or **M1** for 4 × 12 × 158 or **B1** for 48 or 632 or 1896 seen
15(a)	Fully correct frequency diagram	**3**	**B1** for uniform vertical scale **B1** for all heights correct **B1** for bars of uniform width with no gaps or frequency polygon with points plotted at centres of intervals and joined with straight lines
15(b)	40	**1**	
16	Attempts to find the number of slabs	**M1**	
	20 slabs	**A1**	
	2.60 × *their* 20	**M1**	**Dep** on **M1**
	52	**A1**	**FT** *their* 20
	their 52 + 5 for 50 ⩽ *their* 52 ⩽ 100 or *their* 52 + 15 for 0 < *their* 52 < 50	**B1**	**FT** *their* 52 **B0** if *their* 52 is greater than 100 unless Delivery is free oe is clearly stated
17	900 2700 5400	**3**	**B1** for each correct OR **M2** for any two of $9000 \div 10$ and $9000 \div 10 \times 3$ and $9000 \div 10 \times 6$ soi or **M1** for 1 : 3 : 6 oe soi If 0 scored, **SC2** for answers 1500, 3000, 4500 or **SC1** for any two of $\frac{9000}{6}$, $\frac{9000}{6} \times 2$, $\frac{9000}{6} \times 3$ oe
18(a)	$x \leqslant 6$	**1**	
18(b)		**1**	**FT** *their* **(a)** provided an inequality

Question	Answer	Marks	Partial Marks
19	$\frac{4}{11}$	**2**	**M1** for $\frac{11}{4}$ or for $\frac{1}{2\frac{3}{4}}$ or for $\frac{4}{their 11}$
20(a)	5.67×10^{-2} cao	**1**	
20(b)	7.324×10^{14} cao	**2**	**M1** for $7.3\times10^{14}+0.024\times10^{14}$ or $730\times10^{12}+2.4\times10^{12}$ or answer figs 7324
21	Correct enlargement drawn	**2**	**B1** for enlargement of the correct size and orientation but in the wrong position or for 4 or 5 vertices plotted correctly
22(a)	$4k+4$ or $4(k+1)$ final answer	**2**	**M1** for $2k\times1.6+0.8\times(k+5)$ oe or **B1** for $3.2k$ seen or $0.8k+4$ seen or answer $4k+c$
22(b)	60	**2**	**M1FT** for $their(4k+4)=244$ oe soi
23	$5\frac{1}{6}$ or $5\frac{k}{6k}$	**3**	**B1** for $\frac{11k}{18k}$ seen **M1** for $[5]\frac{14k}{18k}-their\frac{11k}{18k}$ oe where denominators are both the same If 0 scored, **SC2** for answer $3\frac{13k}{54k}$ or **SC1** for $\frac{175}{36}$ oe seen
24	Two different accurately constructed triangles.	**4**	**B3** for one triangle *DEF* accurately drawn or **B2** for a triangle satisfying two conditions or **B1** for a triangle satisfying one condition or for an incomplete triangle satisfying two conditions
25	4, 5, 5, 5, 11 or 3, 5, 5, 7, 10	**3**	**B1** for five numbers with mode = 5 and median = 5 **B1** for five numbers that total 30 **B1** for five numbers with range = 7 **Maximum 2 marks if answer incorrect**
26	[0].375	**2**	**M1** for attempt at 3 ÷ 8 or for [0].125 seen
27(a)	$-6x$	**2**	**M1** for x^2-3x or $-x^2-3x$ or $x(x-3-(x+3))$
27(b)	x^{10}	**1**	
28	100π final answer	**2**	**M1** for $\pi\times5\times5[\times4]$ oe

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