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

MATHEMATICS **0626/03**

Paper 3 **October/November 2018**

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 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

This syllabus is regulated for use in England as a Cambridge International Level 1/Level 2 (9–1) Certificate.

This document consists of **7** printed pages.

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.

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

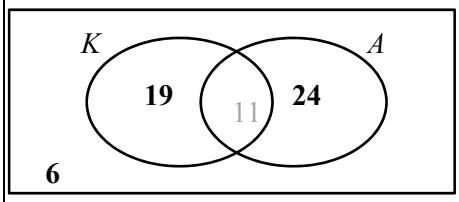
awrt answers which round to
cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
nfww not from wrong working
oe or equivalent
rot rounded or truncated
SC Special Case
soi seen or implied

Question	Answer	Marks	Partial Marks
1	2	**1**	
2(a)	2628	**1**	
2(b)	2400	**1**	
3	$\frac{7}{25}$ final answer	**2**	**M1** for $\frac{28}{100}$ or better
4	12 12[pm] or 12.12 or 12:12	**2**	**M1** for 2 hrs 24 soi
5	correct tallies and 4, 6, 3, 5	**2**	**M1** for 4 correct tallies or 4 correct frequencies or for 2 correct tallies with correct frequencies or for 4 correct frequencies in the tallies column

Question	Answer	Marks	Partial Marks
6(a)(i)	13	**1**	
6(a)(ii)	5.5	**2**	**M1** for either 1, 4, 5, 6 or 14, 12, 6, 5 seen or 5 and 6 indicated
6(a)(iii)	7	**2**	**M1** for $(5 + 4 + 14 + 6 + 12 + 1) \div 6$ oe or **B1** for 42 seen
6(b)	Valid comment	**1**	
7	5	**2**	**B1** for two of 70, 50, 4 seen or **SC1** for $(71 - 49) \div 4 = 22 \div 4 = 5.5$ or 5 or 6
8	> > =	**3**	**B1** for each correct
9(a)	$16 - (3 + 2) - 7 = 4$	**1**	
9(b)	$7 + 3 \times (6 + 8) \div 2 = 28$	**1**	
10	28	**4**	**B1** for sum of the four angles equals 360 soi **B1** for $10x + 80$ **M1** for simplifying *their* equation to $ax = b$ **M1** for $x = \frac{b}{a}$ after $ax = b$ seen, $a \neq 1$ **Incorrect answer scores maximum 3 marks**
11(a)	7	**2**	**M1** for –6 or 14 soi
11(b)	4	**2**	**M1** for 32 soi or for a reverse function machine soi
12	Correct perpendicular bisector with correct arcs	**2**	**M1** for correct perpendicular bisector with incorrect or no arcs or for 2 correct pairs of arcs seen.
	Correct angle bisector with correct arcs	**2**	**M1** for correct angle bisector with incorrect or no arcs or for 2 correct pairs of arcs seen.
	Correct region shaded	**1**	**FT** their angle bisector and perpendicular bisector provided at least M1 and M1 scored.
13(a)	$\begin{pmatrix} 10 \\ -3 \end{pmatrix}$	**1**	
13(b)	$\begin{pmatrix} -3 \\ 5 \end{pmatrix}$	**1**	
14(a)	51	**1**	

Question	Answer	Marks	Partial Marks
14(b)	80 000	**1**	
15(a)	64	**1**	
15(b)	$\frac{2}{3}$	**1**	
15(c)	1	**1**	
16	$\frac{31}{40}$ or equivalent fraction	**3**	**M2** for both fractions with denominators of $40k$ (k an integer) or $\frac{15.5}{20}$ or $\frac{77.5}{100}$ or $\frac{31}{20} \div 2 \div 2$ seen or **M1** for both fractions with common denominator $20k$ seen or for seeing $\left(\frac{3}{4}+\frac{4}{5}\right) \div 2$
17	27	**3**	**M1** for $\frac{54}{6}$ soi **M1** for $\sqrt{their \frac{54}{6}}$
18	$[w =] \frac{t-2}{3}$ oe final answer	**2**	**M1** for $t-2=3w$ or $\frac{t}{3}=w+\frac{2}{3}$ If 0 scored, **SC1** for answer $[w =] \frac{t+2}{3}$ or $[w =] t-2 \div 3$ or $[w =] \frac{t}{3}-2$
19	$[x =]$ 24 $[y =]$ 6	**3**	**B2** for $x = 24$ or $y = 6$ with no incorrect working or $x = 6$ and $y = 24$ with no incorrect working or **M1** for $\frac{8}{4}$ or $\frac{4}{8}$ or $\frac{18}{12}$ or $\frac{12}{18}$ or $\frac{12}{4}$ or $\frac{4}{12}$
20(a)	£ per kg so needs to choose least amount for better value oe	**1**	
20(b)	more kg per £ oe	**1**	

Question	Answer	Marks	Partial Marks
21(a)	$[x =] 4$ $[y =] 0.5$ oe	**3**	**M1** for correctly eliminating one variable or for correctly rearranging one equation and substituting into the other equation **A1** for either answer correct with correct working If 0 scored **SC1** for two values satisfying one of the original equations.
21(b)	$5x - 2y$ cannot be equal to two different values or the lines are parallel oe	**1**	
21(c)	The equations are the same as they are multiples of each other or the lines are the same oe	**1**	
22(a)	$\frac{1}{3}, \frac{1}{5}, \frac{4}{5}, \frac{1}{5}, \frac{4}{5}$ oe	**2**	**B1** for $\frac{1}{3}$ or $\frac{4}{5}$ oe seen in correct place
22(b)	$\frac{8}{15}$ oe	**2**	**M1** for $\frac{2}{3} \times \textit{their} \frac{4}{5}$
23	$15 - 7r$ final answer	**2**	**B1** for $8r + 12$ or $3 - 15r$ seen or final answer $15 + kr$ or $m - 7r$
24	8	**3**	**M1** for use of area of trapezium formula soi **M1dep** for correct first step rearranging *their* equation
25	59.5, 60.5	**2**	**B1** for one correctly placed. If 0 scored, **SC1** for both correct but reversed.
26	16	**2**	**B1** for $\left[\sqrt[3]{64}\right] = 4$ or $(\textit{their}\ 4)^2$
27	$180 - 150 = 30$	**M1**	or $(n-2) \times 180 = 150n$
	$360 \div 30 = 12$	**A1**	correct completion to $n = 12$
28	$12 + 10\pi$ final answer	**3**	**M1** for $2 \times \pi \times 5$ [÷4] oe **M1** for $\textit{their}(2 \times \pi \times 5) + 4 \times 3$

Question	Answer	Marks	Partial Marks
29	–4	**3**	**M1** for $7 - x = \frac{55}{5}$ **M1** for $-x = \textit{their}\ (11 - 7)$ or better **M1** for correct completion OR **M1** for $35 - 5x[= 55]$ **M1** for collecting xs and numbers on opposite sides **M1** for $x = \frac{a}{b}$ following $bx = a$ $(b \neq 1, a \neq 0)$ **Incorrect answer scores max 2 marks**
30(a)		**2**	**B1** for 2 correct values If 0 scored, **SC1** for 6 placed correctly and sum of 4 values = 60
30(b)	54	**1**	**FT** *their* **(a)**