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

MATHEMATICS **0626/02**

Paper 2 (Extended) **May/June 2017**

MARK SCHEME

Maximum Mark: 60

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 will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2017 series for most Cambridge IGCSE®, Cambridge International A and AS Level and Cambridge Pre-U 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.

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	Part Marks
1(a)	0.15 oe	**2**	**M1** for $0.35 + 0.4 + k + 0.1 = 1$ or better or **B1** for 0.85 seen
1(b)	48	**1**	
2(a)	m^3	**1**	
2(b)	y^{-8}	**1**	
2(c)	$\frac{x^5y^4}{7}$	**2**	**M1** for 2 correct parts and both x and y present ie : $\frac{x^ky^4}{7}$ or $\frac{x^5y^k}{7}$ or kx^5y^4 $(k \neq 0)$
3	Any irrational number between 6 and 7	**1**	
4	8.553	**2**	**M1** for 8.55[…] If 0 scored, **SC1** for *their* answer seen and rounded correctly to 3dp
5(a)	13.15, 13.25	**2**	**B1** for each or **SC1** for both answers correct but reversed.
5(b)	$2\pi \times 2.1$	**M1**	
	13.19…	**A1**	
	their 13.19 > 13.15 oe	**B1**	Showing *their* circumference > 13.15
6(a)	16.8	**4**	**M1** for $8.4 \times 150\,000$ soi and **M1** for division by 10^5 oe soi and **M1** for $\frac{\textit{their}\ \text{distance}}{45} \times [60]$ oe
6(b)	A valid comment	**1**	**FT** from *their* final speed answer in part (a)

Question	Answer	Marks	Part Marks
7	1936 and 81 or 44^2 and 9^2	**2**	**M1** for 2 correct trials evaluated of form: $a^2 + b^2$ where $a < 10$ and $b > 10$ and a and b are integers or $2017 - a^2 = b^2$ where a is a positive integer with b^2 being tested to see if it is square If 0 scored, **SC1** for 44 and 9 seen as a pair
8(a)	95.4 or 95.39 to 95.40	**3**	**M2** for $[LN =]\frac{85}{\cos 27}$ oe or **M1** for $\cos 27 = \frac{85}{LN}$ oe
8(b)	38.6 or 38.58 to 38.59	**3**	**M2** for $85 \times \sin 27$ oe or **M1** for $\sin 27 = \frac{x}{85}$ oe or **M1** for correct line indicated on a diagram
9	40	**3**	**M2** for $\frac{34}{1-0.15}$ oe or **B1** for 85[%] oe seen
10	16.5	**3**	**M2** for $\sqrt[3]{\frac{2592}{1500}}$ or $\sqrt[3]{\frac{1500}{2592}}$ soi or **M1** for $\frac{2592}{1500}$ or $\frac{1500}{2592}$ oe
11	9 nfww	**2**	**M1** for $\frac{54}{308}$ oe
12(a)	3.2	**3**	**M2** for $w = \frac{400}{t^3}$ oe or $50 \times 2^3 = w \times 5^3$ or **M1** for $w = \frac{k}{t^3}$ oe or 50×2^3 seen
12(b)	10	**1**	
13(a)	Complete correct graph drawn	**1**	
13(b)	$x = 0$ $y = 0$	**2**	**B1** for each

Question	Answer	Marks	Part Marks
14(a)	37	**2**	**M1**for $3(3\times5-2)-2$ or $3(3x-2)-2$ or f(5)=13 or f(13)
14(b)	$\frac{x+2}{3}$ final answer	**2**	**M1** for $[x=]\frac{y+2}{3}$ or $y+2=3x$ or $\frac{y}{3}=x-\frac{2}{3}$ or $x=3y-2$ If 0 scored, **SC1** for transposing *x* and *y* in *their* equation for *x* in terms of *y*
14(c)	*x* final answer	**1**	
15	$[y=]3x$	**1**	
16	22.8 or 22.79 to 22.80	**3**	**M1** for $\frac{1}{2}x^2\sin60=25$ or better or $\frac{1}{2}x\times\sqrt{x^2-\left(\frac{x}{2}\right)^2}=25$ **M1** for $x=\sqrt{\frac{25\times2}{\sin60}}$ or $x=\sqrt{\frac{25\times4}{\sqrt{3}}}$
17	$-\frac{1}{2}\mathbf{a}+\frac{1}{6}\mathbf{b}+\frac{1}{3}\mathbf{c}$ or $\frac{(-3\mathbf{a}+\mathbf{b}+2\mathbf{c})}{6}$	**4**	**M1** for $\overrightarrow{AB}=-\mathbf{a}+\mathbf{b}$ or $\overrightarrow{BC}=-\mathbf{b}+\mathbf{c}$ or $\overrightarrow{MN}=\overrightarrow{MB}+\overrightarrow{BN}$ or any other correct vector expression for $\overrightarrow{MN}$ **M1FT** for $\overrightarrow{MB}=\frac{1}{2}their(-\mathbf{a}+\mathbf{b})$ or $\overrightarrow{BN}=\frac{1}{3}their(-\mathbf{b}+\mathbf{c})$ **M1FT** for $\overrightarrow{MN}=\frac{1}{2}their(-\mathbf{a}+\mathbf{b})+\frac{1}{3}their(-\mathbf{b}+\mathbf{c})$

Question	Answer	Marks	Part Marks
18	$x = k \pm \sqrt{k^2 - kt}$ final answer	**4**	**M1** for $(2x - t)k = x^2$ or $2xk - tk = x^2$ or better **M1** for $x^2 - 2kx + kt = 0$ or $x^2 - 2kx = -kt$ **M1FT** for $\frac{2k \pm \sqrt{4k^2 - 4kt}}{2}$ or $(x - k)^2 - k^2 = -kt$