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Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

MATHEMATICS **0626/03**

Paper 3 (Core) **May/June 2017**

MARK SCHEME

Maximum Mark: 84

Published

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This document consists of **6** printed pages.

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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

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Question	Answer	Marks	Part Marks
1	–3	**1**	
2	$\frac{2}{25}$ cao	**2**	**M1** for correct fraction not in lowest terms or for correctly cancelling *their* $\frac{8}{100}$ to lowest terms
3	7.39	**2**	**M1** for 2 × 2.95 + 1.49 soi or **B1** for 5.9[0] or 590 seen or **SC1** for figs 739
4	11	**2**	**M1** for $\frac{12+8+6+14+15}{5}$ or **B1** for 55 seen
5(a)	$3\frac{1}{2}$ oe	**1**	
5(b)(i)	13	**3**	**B1** for 30 hours seen **M1** for 390 ÷ (*their* 30) oe
5(b)(ii)	Valid comment	**1**	e.g. Ali earns the same amount for every hour he works or He did not get paid overtime or He is paid per hour not a fixed amount per week
6	Credit [City]	**1**	
7(a)	4 5 6 7 8 3 4 5 6 7 2 3 4 5 6 1 2 3 4 5 + 1 2 3 4	**1**	
7(b)	$\frac{2}{16}$ oe isw	**2**	**B1** for numerator or denominator correct
8(a)	Circle, centre *P*, radius 3 cm	**1**	
8(b)	Correct point plotted	**1**	
8(c)	(6, 3)	**1**	do not award if *Q* incorrectly plotted in (b) If 0 scored, **SC1** for (3, 6) after *Q* plotted at (3, 0)
9	0.6 oe	**1**	
10	mode with any valid comment	**1**	e.g. [it describes the] most popular or you cannot work out the mean and median [for this data] or the data is categorical oe
11(a)	11	**1**	
11(b)	–4	**1**	

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Question	Answer	Marks	Part Marks
11(c)	3.5 oe	2	**M1** for 4.5 seen
12(a)	128° to 132°	1	
12(b)	Valid comment	1	e.g. Bearings are measured clockwise or it should be a reflex angle or it should be 265°
13(a)	pyramid	1	
13(b)	27	2	**M1** for 3 × 3 × 3 oe soi
14	80	4	**M1** for $\frac{640}{8}$ **A1** for 240 **M1** for $\frac{640 - \textit{their}\,240}{5}$ oe
15	9	2	**M1** for $\frac{1}{2} \times 10 \times [...] = 45$ oe or $\frac{2 \times 45}{10}$ oe or 5 × 9 seen
16(a)	Valid comment	1	e.g. The answer cannot be more than $\frac{8}{9}$ or he has not found a common denominator or the answer is unreasonable as it is bigger than 1
16(b)	$\frac{19}{72}$ oe	2	**M1** for use of common denominator of 9 × 8 oe, with at least one numerator correct ie 8 × 8 or 5 × 9
17	720 g oe 180 g oe 1800 ml oe	4	**B3** for any two correct values with units or **B2** for any correct value with units or **M1** for multiplying by 1.5 oe, at least once and **M1** for attempt at correct conversion e.g. 4 × 30 seen If 0 scored then **SC3** for all figures correct but units omitted or **SC2** for 2 figures correct but units omitted or **SC1** for 1 figures correct but units omitted
18	6	2	**B1** for two from 60, 0.3, 3 seen
19(a)	[x =] 120	2	**M1** for $\frac{360}{6}$ or 4 × 180
	[y =] 60	1	**FT** half of *their* 120 or 180 – *their* 120

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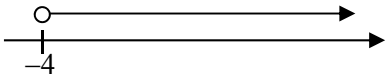
Question	Answer	Marks	Part Marks
19(b)	Valid comment	1	e.g. the longest side is always opposite the largest angle oe or *BE* is the hypotenuse or triangle *BAE* is right-angled oe or the shortest distance from a point to a line is the perpendicular distance oe
20(a)	$x > -4$ final answer	1	
20(b)		1	**FT** *their* inequality from part (a) Correct arrow with empty circle starting at *their* –4
21	3×10^{-4} final answer	2	**M1** for $k\times10^{-4}$ or 3×10^{k} for non-zero k or **B1** for 0.0003 or $\frac{3}{10000}$ or 30×10^{-5} as final answer
22	$\frac{4}{9}$	2	**M1** for $\frac{9}{4}$ or $\frac{1}{2\frac{1}{4}}$ or $\frac{1}{2.25}$ or $\frac{1}{their\,9/4}$
23(a)	1000	2	**M1** for 10^3 or $\left(10^6\right)^{\frac{1}{2}}$ or $\sqrt{1000000}$ or $\sqrt{1000\times1000}$
23(b)	$\frac{1}{5}$ oe	1	
24	$x=\frac{y+z}{w}$ oe isw	2	**M1** for correct first step: $y+z=wx$ or $\frac{y}{w}=x-\frac{z}{w}$ If 0 scored then **SC1** for $\frac{y+z}{w}$ or $x=\frac{y}{w}+z$ or $x=\frac{y-z}{w}$ oe
25	Correct bisector drawn with 2 correct pairs of arcs	2	**M1** for correct bisector with incorrect or no arcs or 2 correct pairs of arcs seen.
26	$[y=]-2x+5$ final answer	3	**B2** for $[y=]mx+5,\ m\neq0$ or $[y=]-2x+c$ or for $[y=](their-2)x+their\,c$ provided calculation for *their*–2 seen and *their c* follows *their m* or **B1** for $[y=]mx+5$ and **M1** for $\frac{5-(-1)}{0-3}$ oe or for correct substitution of (3, –1) or (0, 5) into *their* linear equation,

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Question	Answer	Marks	Part Marks
27(a)	$\begin{pmatrix}17\\-6\end{pmatrix}$	2	**B1** for $\begin{pmatrix}12\\-4\end{pmatrix}$ or $\begin{pmatrix}17\\k\end{pmatrix}$ or $\begin{pmatrix}k\\-6\end{pmatrix}$ or $\begin{pmatrix}17\\-6\end{pmatrix}$
27(b)	[a =] $\frac{1}{2}$, [b =] 4	2	**B1** for each or **M1** for $4a - 2b = -6$ or [$0a$ +] $3b = 12$
28	[x =] 4, [y =] –3	4	**M1** for two correct equations with a common coefficient for x or y; allow one error in arithmetic or for correct rearrangement of one equation to either $x = \ldots$ or $y = \ldots$; allow one sign error **M1** for correct elimination of x or y; allow one further error in arithmetic **A1** for one correct answer from correct working If 0 scored, **SC1** for both of *their* answers satisfying one of the original equations
29(a)	3.5cm circle centre A	1	
29(b)	Correct region shaded	2	**B1** for arc centre B, radius 7cm, crossing a circle centre A twice and **B1FT** for correct region shaded, following through *their* intersecting circles
30(a)	$5y(x-4y)$ final answer	2	**M1** for $5(xy-4y^2)$ or $y(5x-20y)$ or $5y(x-4y)$ seen
30(b)(i)	$(w-1)(w+1)$	1	
30(b)(ii)	9800	2	**M1** for (99 – 1)(99 + 1) seen or for $w = 99$ substituted into *their* (b)(i)
31	–6, 8	3	**M2** for $(x+6)(x-8)$ or **M1** for $(x+a)(x+b)$ where $ab = -48$ or $a + b = -2$ or for $x(x-8)+6(x-8)$ or $x(x+6)-8(x+6)$ After M1, **SC1** for $x = -$*their a*, $x = -$*their b* If 0 scored, **SC1** for an answer of –6 or 8