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CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/31**

Paper 3 (Core) **October/November 2017**

MARK SCHEME

Maximum Mark: 96

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.

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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)(i)	783	**2**	**M1** for 280 × 1.50 or 330 × 1.10 soi by 420 or 363
1(a)(ii)	96	**1**	
1(a)(iii)	80	**1**	
1(b)	12	**2**	**M1** for $\frac{15}{1.2}$ oe soi by 12.5
	[0].6[0]	**1**	
1(c)	120	**2**	**M1** for 600 × 0.04 [× 5] oe or [600 ×] 0.04 × 5
2(a)(i)	9 × 35 [= 315]	**1**	
2(a)(ii)	36	**2**	**M1** for 315 + 45 oe
2(b)	24	**2**	**M1** for $\frac{72}{5+4+3}$ soi by 6
3(a)(i)	3562.85	**1**	
3(a)(ii)	3560	**1**	
3(a)(iii)	3600	**1**	
3(b)	–25	**2**	**B1** for –24.9 or –24.86 to –24.85
3(c)	12.5	**1**	
3(d)	$\frac{19}{50}$	**2**	**B1** for $\frac{38}{100}$
3(e)	3, 7, 9, 21	**2**	**B1** for 2 correct factors in any order
3(f)	0.5^2, 55%, 0.59, $\frac{3}{5}$ oe	**2**	**B1** for 3 in the correct order
4(a)(i)	1 or 7 or 9 or 27	**1**	
4(a)(ii)	1 or 9	**1**	
4(a)(iii)	7	**1**	
4(b)(i)	$\frac{3}{10}$ oe	**1**	
4(b)(ii)	0	**1**	
4(b)(iii)	$\frac{5}{10}$ oe	**1**	

Question	Answer	Marks	Partial Marks
5(a)(i)	50	**1**	
5(a)(ii)	30	**1**	
5(b)	46.25	**2**	**M1** for at least 2 of $30 \times 9 + 40 \times 5 + ...$ soi by 1110
5(c)	Correct bars	**2**	**B1** for 2 or 3 correct bars
6(a)	Correct pattern	**1**	
6(b)	5, 7, 9	**2**	**B1** for 2 correct
6(c)	$2n - 1$ oe	**2**	**M1** for $2n - k$ or $kn - 1$
6(d)	35	**2**	**FT** *their* (c) **M1** for substituting 18 in *their* (c)
7	$[p] = 48$	**1**	
	$[q] = 30$	**1**	
	$[r] = 29$	**1**	
	$[s] = 61$	**1**	
	$[t] = 47$	**1**	
8(a)	80 140 260 320	**2**	**B1** for 2 or 3 correct
8(b)	Correct curve drawn	**2**	**FT** from (a) but only if numbers are increasing **B1FT** for 2 points plotted correctly
8(c)(i)	54 to 56	**1**	**FT** *their* curve
8(c)(ii)	22 to 26	**2**	**M1** for 66 to 68 or 42 to 44 seen
8(c)(iii)	400 – *their* cf value	**2**	**FT** **B1** for *their* cf value
9(a)	220	**1**	
9(b)	346 or 345.5 to 345.6…	**2**	**M1** for $\pi \times 220$ [÷ 2] soi
9(c)	726 or 725.5 to 725.6…	**1**	**FT** 380 + *their*(b)
9(d)	9.67 or 9.68 or 9.673 to 9.676	**2**	**M1** for $\frac{\text{distance}}{\text{speed}}$

Question	Answer	Marks	Partial Marks
9(e)	36 600 to 36 610	**3**	**M2** for $220 \times 80 + 0.5 \times \pi \times (0.5 \times 220)^2$ or **M1** for 220×80 or $0.5 \times \pi \times (0.5 \times 220)^2$
10(a)	Correct sketch	**4**	**B1** for 150° correct **B1** for 225 m and *B* marked **B1** for 60° correct **B1** for 270 m and *C* marked
10(b)	351 or 351.4 to 351.5	**2**	**M1** for $225^2 + 270^2$
10(c)	[0]99.8 or [0]99.80 to [0]99.81	**3**	**M1** for $\tan[\ \ ] = \frac{270}{225}$ oe **M1** for subtracting answer from 150
11(a)	-4	**2**	**M1** for correct first step
11(b)	$x^2 + 2x - 3$ final answer	**2**	**M1** for $x^2 + 3x$ or $-x - 3$
11(c)	$xy(xy^2 - 3)$ final answer	**2**	**M1** for $x(xy^3 - 3y)$ or $y(x^2y^2 - 3x)$
11(d)(i)	8	**1**	
11(d)(ii)	16	**1**	
11(e)	$\frac{y}{15}$	**2**	**M1** for both fractions written with denominator $15k$ or better
12(a)	Correct sketch	**2**	**M1** for correct shape
12(b)(i)	(–1.5, 0) (2, 0)	**2**	**B1** for each
12(b)(ii)	(0, – 9)	**1**	
12(c)	(0.25, – 9.19) or (0.25, – 9.188 to – 9.187)	**2**	**B1** for *x* co-ordinate **B1** for *y* co-ordinate
12(d)	–1.92 or –1.925 to –1.924	**1**	
	2.42 or 2.424 to 2.425	**1**	