Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/33**

Paper 3 (Core) **May/June 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.

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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.

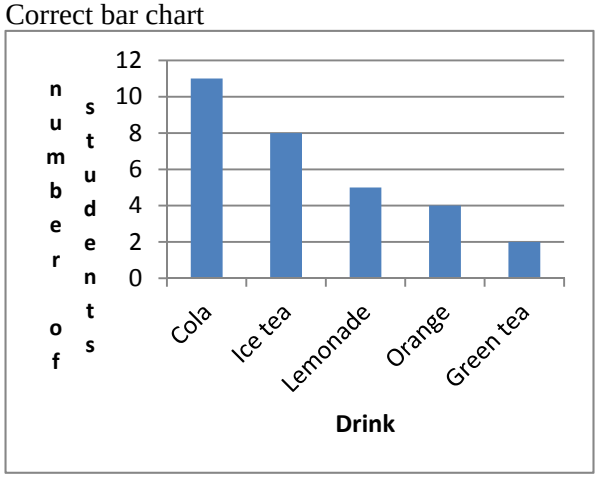
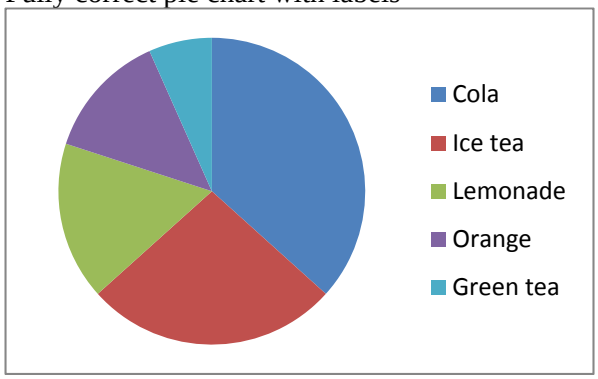
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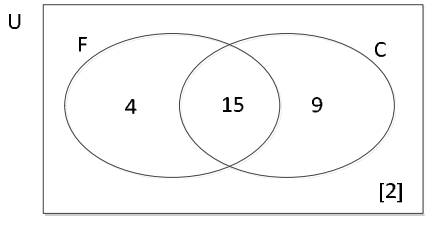
awrt	answers which round to
cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
nfww	not from wrong working
oe	or equivalent
rot	rounded or truncated
SC	Special Case
soi	seen or implied

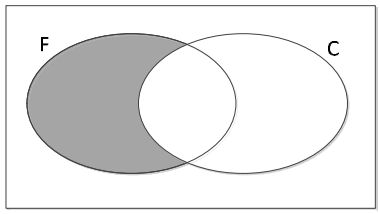
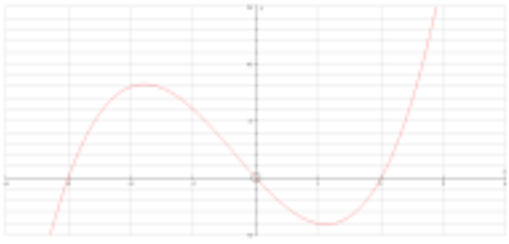
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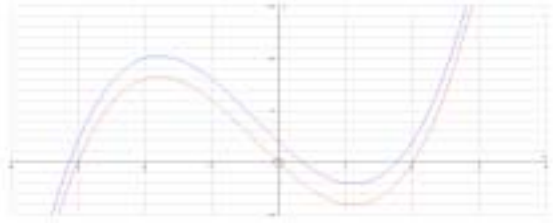
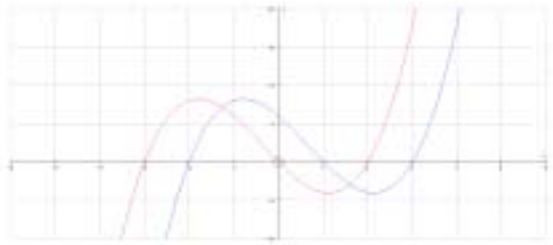
Question	Answer	Marks	Part Marks
1(a)(i)	4[.00]	**1**	
1(a)(ii)	1[.00]	**1**	**FT** 5 – *their* 4
1(a)(iii)	8[.00]	**2**	**B1** for 10 soi or for 3 bars = 1.6[0]
1(a)(iv)	6	**2**	**M1** for dividing by (3 + 2) soi
1(b)	$6p + 2s = 4.2$[0] oe	**M1**	
	p = [0].5[0]	**A1**	
	3×*their* $p + 1s = 2.1$[0] oe	**M1**	
	s = [0].6[0]	**A1**	If zero scored, **SC1** for correct answers with no working
2(a)(i)	3 002 001	**1**	
2(a)(ii)	–2	**1**	
2(a)(iii)	11.2	**1**	
2(b)	[1], 2, 4, 5, 10,[20]	**2**	**B1** for 2 correct values
2(c)(i)	70.516	**1**	
2(c)(ii)	70.52	**1**	**FT** *their* (c)(i) rounded to 2dp
2(c)(iii)	71	**1**	**FT** *their* (c)(i) rounded to 2sf
3(a)	$3a + 11b$ final answer	**2**	**B1** for $11b$ or $3a$ seen
3(b)(i)	–8	**2**	**B1** for –18 or 10 seen or **M1** for 6(–3) + 2 (5)
3(b)(ii)	3	**2**	**M1** for $26 = 6M + 2 \times 4$ oe
3(c)	–5	**2**	**M1** for a correct first step
3(d)	$3a(a – 4b)$ final answer	**2**	**M1** for $3(a^2 – 4ab)$ or $a(3a – 12b)$
3(e)	$8x^5y^3$ final answer	**2**	**B1** for $8x^ky^3$ or $8x^5y^k$ or kx^5y^3
4(a)	4 correct points plotted	**2**	**B1** for 2 points correctly plotted
4(b)(i)	169.375	**1**	
4(b)(ii)	67.5	**1**	
4(c)(i)	Correct point plotted	**1**	**FT** *their* (b)

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Question	Answer	Marks	Part Marks
4(c)(ii)	Ruled line through *their* plotted mean point with positive gradient within tolerance	**2**	**B1** for ruled line through *their* plotted mean point with positive gradient but not within tolerance or for ruled line within tolerance but not through *their* plotted mean point
4(c)(iii)	66 to 76	**1**	
5(a)	Correct bar chart 	**2**	**B1** for 2 bars correct or for all heights correct but different widths.
5(b)(i)	$\frac{8}{30}$ oe	**1**	
5(b)(ii)	$\frac{6}{30}$ oe	**1**	
5(b)(iii)	0 oe	**1**	
5(c)	Fully correct pie chart with labels 	**3**	**B2** for correct sectors without labels or 1 correct sector with label or **B1** for 1 correct sector without label or **B1** for labelled diagram with sectors in the correct order of size or **M1** for 1 angle correctly calculated
6(a)	180	**2**	**B1** for $\frac{35}{60}$ oe or $\frac{105}{35}$ soi
6(b)	1 hour 15 minutes	**2**	**M1** for $\frac{105}{84}$ oe soi

Question	Answer	Marks	Part Marks
7(a)	[1] | [2] 5 6 6 8 8 [2] | 1 3 3 3 3 6 [3] | 2 3 4 5 7 [4] | 1 1 2 6 7 8	**2**	**B1** for correct table but 1 or 2 errors or for values correct but unordered
	E.g. 1 | 2 = 12 [steps]	**1**	
7(b)(i)	23	**1**	
7(b)(ii)	26	**1**	
7(b)(iii)	23	**2**	**B1** for 41 or 18
7(b)(iv)	29.1 or 29.13…	**1**	
8(a)	0.215	**1**	
8(b)	$\frac{43}{200}$ $\frac{13}{50}$ $\frac{11}{40}$ $1\frac{1}{4}$ oe	**1**	
8(c)	26	**1**	
8(d)	27.5	**1**	
8(e)(i)	$\frac{19}{40}$ oe	**1**	
8(e)(ii)	$\frac{55}{52}$ oe	**1**	
8(e)(iii)	$\frac{43}{160}$ oe	**1**	
9(a)	132	**1**	
	149	**1**	**FT** *their* 132 + 17
9(b)	47 + 17*n* oe	**2**	**B1** for 47 or 17*n*
10(a)		**2**	**B1** for 1 number correct
10(b)	13	**1**	**FT** *their* Venn diagram

Question	Answer	Marks	Part Marks
10(c)	U 	**1**	
10(d)	$\frac{9}{30}$ oe	**1**	**FT** *their* Venn diagram
11(a)	Correct diagram with vertices at (–1, 3), (–1, 1), (–4, 1), (–4, 3)	**1**	
11(b)	Correct diagram with vertices at (1, –1), (3, –1), (3, –4), (1, –4)	**2**	**B1** for correct 90° anticlockwise rotation about origin or for correct orientation, wrong position
11(c)	Correct diagram with vertices at (–5, –2), (–5, –4), (–2, –2), (–2, –4)	**2**	**B1** for translation $\begin{pmatrix}-6\\k\end{pmatrix}$ or $\begin{pmatrix}k\\-5\end{pmatrix}$ or **SC1** for translation $\begin{pmatrix}-5\\-6\end{pmatrix}$
12(a)	18.8 to 18.9	**3**	**B2** for answer 11.78 to 11.8 or **M2** for $2\times\pi\times1.5\times0.5$ + $2\times\pi\times1.5^2$ seen or **M1** for $2\times\pi\times1.5\times0.5$ or [2 ×] π × 1.5^2
12(b)(i)	53[.0] or 53.01 to 53.02	**2**	**M1** for π × 1.5^2 × 0.5 [× 15]
12(b)(ii)	2.4	**3**	**B2** for 2.37… or **M1** for *their* 53.0 = $\pi\times r^2\times3$ oe soi
13(a)	Correct sketch 	**2**	**B1** for maximum and minimum in correct quadrants.
13(b)	(0, 0)	**1**	
13(c)	(–3, 0), (0, 0), (2, 0)	**2**	**B1** for 2 correct
13(d)	(1.12, –4. 06)	**2**	**B1** for each value or **SC1** for (1.1, −4.1)

Question	Answer	Marks	Part Marks
13(e)(i)	Correct sketch 	**1**	**FT** *their* (a)
13(e)(ii)	Correct sketch 	**1**	**FT** *their* (a)