MARK SCHEME for the May/June 2015 series

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/31   Paper 3 (Core), maximum raw mark 96

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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Abbreviations

cao   correct answer only
dep   dependent
FT   follow through after error
isw   ignore subsequent working
oe   or equivalent
SC   Special Case
nfww   not from wrong working
soi   seen or implied

Question		Answer	Mark	Part Marks
1	(a)	300 058	1	
	(b)	−6	1	
	(c)	21 600	1	
	(d)	0.06	1	
	(e)	78	1	
	(f)	23	1	
	(g)	$\dfrac{13}{20}$	2	**M1** for $\dfrac{65}{100}$
	(h)	76, 57	2	**M1** for dividing by 7 soi
2	(a)	$8x - 2y$ as final answer	2	**B1** for $8x - ky$ or $kx - 2y$ as final answer
	(b)	16	2	**M1** for $2 \times 3 + -2 + 3 \times 4$ seen or **B1** for 6 and 12 seen
	(c)	5.1	2	**B1** for 8.4 seen or **M1** for $18.6 = 2x + 3 \times 2.8$ seen
	(d)	2	2	**M1** for correct first step
	(e)	0 −1 2 3 3 5	2	**B1** for −1 **B1** for 3 and 5
3		$a = 90$ $b = 26$ $c = 64$ $d = 116$	1 1 1 1 FT	**FT** $180 -$ *their c*
4	(a)	345	2	**M1** for $30 \times 10 + 3 \times 15$
	(b)	1110	2 FT	**M1** for $5 \times 33 + 600 +$ *their* 345
	(c)	37	2 FT	**M1** for *their* $\dfrac{1110}{30}$
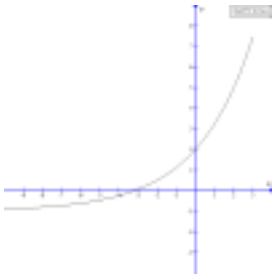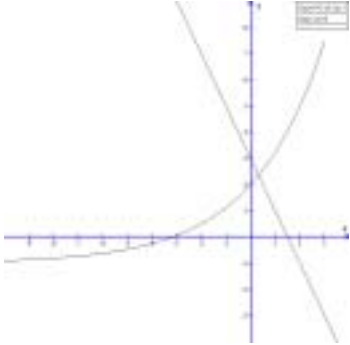
5	(a)	(i)	8	1	
		(ii)	5.5	1	
		(iii)	4.5	1	
		(iv)	6	1	
		(v)	5.75	1	
	(b)	(i)	2 1 3 0 4 1 5 2 6 1 7 0 8 3	1	
		(ii)	Correct bar chart	2 FT	**B1 FT** for 4 bars correct
6	(a)		3750	2	**M1** for $25 \times 75 \times 2$
	(b)	(i)	4150	3	**M2** for $2(25 \times 2 + 75 \times 2 + 25 \times 75)$ or **B1** for 50, 150, 1875 soi
		(ii)	0.415	1 FT	**FT** *their* **(b)(i)** $\div$ 10 000
	(c)		$5 \times 3 + 6 \times 4 + 4 \times 2.5 + 3 \times 7$ [= 70] yes	1 1 FT	**M1** for correct method **A1 FT** dep *their* 70 [strict]
7	(a)		−5 −12	1 1	
	(b)		$30 - 7n$	2	**B1** for $30 - kn$, $k \neq 0$, or $j - 7n$
8	(a)		$-\dfrac{1}{2}$ oe	2	**M1** for dividing by 2 oe
	(b)		$-\dfrac{1}{2}$ oe	1 FT	**FT** *their* $-\dfrac{1}{2}$
	(c)		$[y =] -\dfrac{1}{2}\, x + 6$	1 FT	**FT** *their* **(b)**

9	(a)	(i)	2, 3, 6	1	
		(ii)	3, 6	1	
		(iii)	2, 3, 4, 5, 6	1	
		(iv)	1, 2	1	
		(v)	4, 5	1	
	(b)		6	1	
10	(a)		Correct line	1	
			$y = 3$	1 FT	**FT** *their* line $y = k,\ 2 \leqslant k \leqslant 4$ or $x = 4$
	(b)		$\begin{pmatrix} 4 \\ -3 \end{pmatrix}$	2	**B1** for $\begin{pmatrix} k \\ -3 \end{pmatrix}$ or $\begin{pmatrix} 4 \\ k \end{pmatrix}$ If 0 scored **SC1** for $\begin{pmatrix} -4 \\ 3 \end{pmatrix}$ or $\begin{pmatrix} -3 \\ 4 \end{pmatrix}$
	(c)		(0, 0)	1	
			90° [anti-clockwise] or –270°	1	
11	(a)		3 min 12 seconds	2	**B1** for 3.2
	(b)		105	3	**M2** for $\dfrac{168}{1.6}$ oe or **M1** for a correct time conversion.
12	(a)		$\dfrac{1}{80}, \dfrac{79}{80}$ $\dfrac{2}{3}, \dfrac{1}{3}$ $\dfrac{1}{50}, \dfrac{49}{50}$	3	**B1** for each pair
	(b)		$\dfrac{1}{240}$	2	**M1** for $\dfrac{1}{80} \times \dfrac{1}{3}$
	(c)		Accept 1 or 2 days	2 FT	**M1 FT** for $250 \times$ *their* **(b)**

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13	(a)	[The triangle is] equilateral $OA = 46$ or angles A and B are 60°	1 1	
	(b)	48.2 or 48.17 to 48.18	2	**M1** for $\dfrac{60}{360} \times 2 \times \pi \times 46$
	(c)	1110 or 1107 to 1108	2	**M1** for $\dfrac{60}{360} \times \pi \times 46^2$
	(d)	916 or 915.4 to 916.3	3	**M1** for $46\cos 30$ oe (= 39.837…) and **M1 FT** dep for $0.5 \times 46 \times$ *their* 39.837…
	(e)	194 or 195 or 190.7 to 194.6	1 FT	**FT** *their* **(c)** – *their* **(d)**
14	(a)		2	**M1** for correct shape through 3 quadrants **A1** for approximately correct axis intercepts (less than half way on both axes)
	(b)	−3.17 or −3.170 to −3.169	1	
	(c)	$y = -1$	1	
	(d)		2	**B1** for negative gradient **B1** for correct *y*-intercept at approximately 3
	(e)	[x =] 0.323 or 0.3225 to 0.3226 [y =] 2.35 or 2.354 to 2.355	1 1	If 0 scored **SC1** for correct co-ordinates reversed.