



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/31

Paper 3 (Core)

October/November 2016

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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Abbreviations

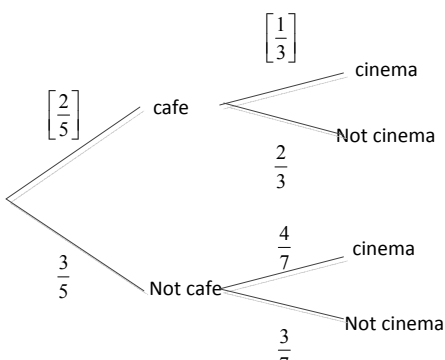
awrt	answers which round to
cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
nfww	not from wrong working
soi	seen or implied

Question	Answer	Mark	Part Marks														
1 (a)	Square equilateral triangle hexagon	1 2 1	B1 for each word														
(b)	[x =] 16 [y =] 8	3	B2 for 1 correct or M1 for 12×4 soi														
2 (a)	55	1															
(b)	<table border="1"> <caption>Bar Chart Data</caption> <thead> <tr> <th>Room</th> <th>Number of People</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>7</td> </tr> <tr> <td>2</td> <td>6</td> </tr> <tr> <td>3</td> <td>12</td> </tr> <tr> <td>4</td> <td>10</td> </tr> <tr> <td>5</td> <td>9</td> </tr> <tr> <td>6</td> <td>11</td> </tr> </tbody> </table>	Room	Number of People	1	7	2	6	3	12	4	10	5	9	6	11	2	B1 for 3 bars with correct height and equal width or 5 bars with correct height
Room	Number of People																
1	7																
2	6																
3	12																
4	10																
5	9																
6	11																
(c) (i)	1800	1															
(ii)	30	1															
(iii)	348	2	M1 for 6×8 oe														
3 (a) (i)	21 or 9	1															
(ii)	-6 or -18	1															
(iii)	9	1															
(iv)	$\frac{5}{8}$ oe	1															


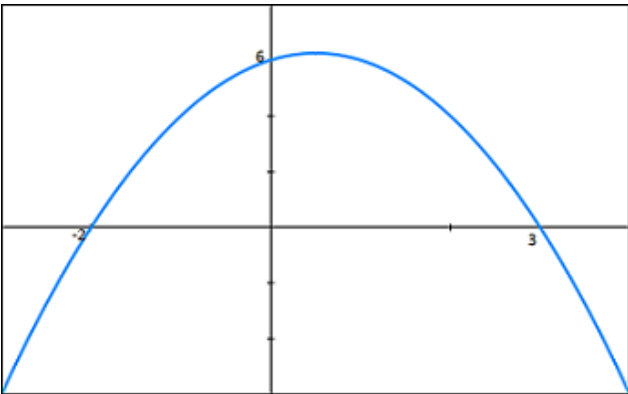
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Question	Answer	Mark	Part Marks
(v)	$\sqrt{3}$ or π	1	
(b) (i)	1.7321	1	
(ii)	1.732	1	
(c)	$\frac{33}{100}$	1	
(d)	3.4	1	
(e)	62.5	1	
4 (a) (i)	M O E Y cao	2	B1 for 2 correct and none incorrect or 3 correct and 1 extra
(ii)	O N	2	B1 for 1 correct and none incorrect or 2 correct and 1 extra
(b) (i)	$[AB =] 12$ $[DF =] 5$	3	B2 for 1 correct or M1 for a correct ratio, equation or correct Pythagoras statement.
(ii)	54 : 6 oe	2 FT	FT <i>their AB</i> B1 for 54 or 6 seen or 3^2 seen or M1 for $0.5 \times 4 \times 3$ or $0.5 \times 9 \times \text{their } AB$
5 (a)	19	1	
(b)	18	1	
(c)	2	2	M1 for 17 or 19 seen
(d)	18.34	2	M1 for multiplying number of petals by frequencies
6 (a)	298 291	1 1 FT	FT <i>their</i> 298 – 7
(b)	$333 - 7n$ oe	2	B1 for $333 - kn$ or $k - 7n$
(c)	Yes, with correct justification soi	1	

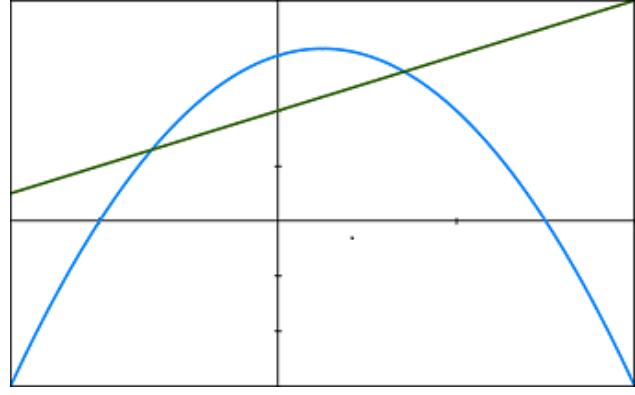
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Question	Answer	Mark	Part Marks
7 (a)	[a =]31 [b =]42 [c =]107 [d =]107	1 1 1 1	
(b)	[p =]28 [q =]90 [r =]62	1 1 1	
8 (a)		3	B1 for $\frac{3}{5}$ B1 for $\frac{2}{3}$ B1 for $\frac{4}{7}$ or $\frac{3}{7}$
(b)	$\frac{2}{15}$ oe	2	M1 for $\frac{2}{5} \times \frac{1}{3}$
(c)	$\frac{10}{21}$ oe	3	M2 for <i>their</i> (b) + <i>their</i> $\frac{3}{5} \times$ <i>their</i> $\frac{4}{7}$ or M1 for <i>their</i> $\frac{3}{5} \times$ <i>their</i> $\frac{4}{7}$
9 (a)	1.2	3	M2 for $\frac{100}{\frac{1000}{5}}$ oe seen or M1 for $\frac{100}{1000}$ or $\frac{5}{60}$ or $\frac{100}{5}$ oe seen
(b) (i)	9	3	M2 for $\frac{6}{40} \times 60$ oe or M1 for $\frac{6}{40}$
(ii)	[0]8 04	1 FT	FT 07 55 + <i>their</i> (b)(i)
(iii)	[0]7 55 + <i>their</i> (b)(i) + 5 minutes oe	1 FT	FT providing before 08 15

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10	<p>(a) (i) 2</p> <p>(ii) $x < 5$</p> <p>(b) </p> <p>(c) (i) $12x^8$</p> <p>(ii) $3y^6$</p> <p>(d) 2 drink + 4 chocolate = 6.10 oe [1] chocolate = 0.85 [1] drink + 2(0.85) = 3.05 oe [1] drink = 1.35</p>	<p>2</p> <p>2</p> <p>1</p> <p>2</p> <p>2</p> <p>M1 A1 M1 A1</p>	<p>M1 for correct first step</p> <p>M1 for correct first step. Allow =, \leq, $>$, \geq for M1</p> <p>B1 for $12x^k$ or kx^8</p> <p>B1 for $3y^k$ or ky^6</p> <p>SC2 for correct answer with no working.</p>
11	<p>(a) 4.24 or 4.241 to 4.242</p> <p>(b) 5.5[0] or 5.497 to 5.498</p> <p>(c) 59.4 or 59.43 to 59.44</p>	<p>2</p> <p>2 FT</p> <p>2</p>	<p>M1 for $\pi \times 1.5^2 [\times 0.6]$ or better</p> <p>M1 for $\pi \times 2^2$ seen</p> <p>M1 for 6×12 – an area seen</p>
12	<p>(a) (i) Fully correct sketch</p> <p></p> <p>(ii) (0, 6)</p> <p>(iii) (-2, 0) (3, 0)</p> <p>(iv) (0.5, 6.25)</p>	<p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>B1 for axes intercepts approximately correct</p> <p>B1 for correct shape</p>

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(b) (i)	Correct line	2	B1 for approximately correct slope B1 for approximately correct y intercept
(ii)	 <p data-bbox="279 694 454 761">(1.41, 5.41) (-1.41, 2.59)</p>	1	1