

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

**MARK SCHEME for the October/November 2011 question paper
for the guidance of teachers**

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/06

Paper 6 (Extended), maximum raw mark 40


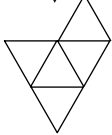
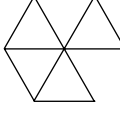

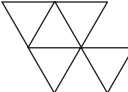

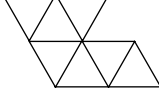
This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

A INVESTIGATION MAXIMISING THE PERIMETER

<p>1</p>	<p>(a) 4 joined equilateral triangles (not in row) e.g. </p> <p>5 joined equilateral triangles (not in row) e.g.  or </p> <p>(b) (i) 6 joined equilateral triangles with a perimeter > 6 e.g.  or </p> <p>(ii) 7 joined equilateral triangles with a perimeter > 7 e.g.  or </p> <p>(c) (i)</p> <table border="1" data-bbox="183 1041 869 1198"> <tr> <td>Number of equilateral triangles</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>Greatest perimeter (cm)</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> </table> <p>(ii) 22 (cm)</p> <p>(iii) 30 (triangles)</p> <p>(d) $x + 2$ oe</p>	Number of equilateral triangles	2	3	4	5	6	7	8	Greatest perimeter (cm)	4	5	6	7	8	9	10	<p>Shapes may <u>not</u> be rotations or reflections of those given</p> <p>1 1 for both a 4 triangle <u>and</u> a 5 triangle diagram</p> <p>1</p> <p>1</p> <p>1 –1 any error or omission C C opportunity</p> <p>1</p> <p>1</p> <p>1 Not $x = y = -1$ mark once only</p>				
Number of equilateral triangles	2	3	4	5	6	7	8															
Greatest perimeter (cm)	4	5	6	7	8	9	10															
<p>2</p>	<p>(a) 14 (cm)</p> <p>(b) (i)</p> <table border="1" data-bbox="183 1668 965 1803"> <tr> <td>Number of squares</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> <tr> <td>Greatest perimeter (cm)</td> <td>6</td> <td>8</td> <td>10</td> <td>12</td> <td>14</td> <td>16</td> <td>18</td> <td>20</td> <td>22</td> </tr> </table> <p>(ii) 36 (cm)</p> <p>(iii) 15 (squares)</p> <p>(c) $2x + 2$ oe</p>	Number of squares	2	3	4	5	6	7	8	9	10	Greatest perimeter (cm)	6	8	10	12	14	16	18	20	22	<p>1 C C opportunity</p> <p>1 –1 any error or omission</p> <p>1</p> <p>1</p> <p>1</p>
Number of squares	2	3	4	5	6	7	8	9	10													
Greatest perimeter (cm)	6	8	10	12	14	16	18	20	22													

Page 3	Mark Scheme: Teachers' version	Syllabus
	IGCSE – October/November 2011	0607

3	(a)													
	<table border="1"> <tr> <td>Number of regular hexagons</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>Greatest perimeter (cm)</td> <td>10</td> <td>14</td> <td>18</td> <td>22</td> <td>26</td> </tr> </table>	Number of regular hexagons	2	3	4	5	6	Greatest perimeter (cm)	10	14	18	22	26	1 C
Number of regular hexagons	2	3	4	5	6									
Greatest perimeter (cm)	10	14	18	22	26									
	(b) $4x + 2$ oe	1												
4	$6x + 2$ oe	1												
5	(a) $(y - 2)x + 2$ oe	2	1 for $y - 2$ seen											
	(b) $x = 24, y = 3$ $x = 12, y = 4$ $x = 8, y = 5$ $x = 6, y = 6$ $x = 4, y = 8$ $x = 3, y = 10$ $x = 2, y = 14$ $x = 1, y = 26$	2FT C	fit their part (a) 1 for one or two correct pairs C opportunity											
		C1	1 for two C opportunities seen											
			[Total: 20]											

Page 4	Mark Scheme: Teachers' version	Syllabus
	IGCSE – October/November 2011	0607

B	MODELLING COVERING CAKES		
1	<p>(a) Volume = $x \times x \times y$ oe e.g. $V = x^2y$ $y = \frac{4000}{x^2}$</p> <p>(b) $S = x^2 + 4xy$ oe $S = x^2 + \frac{4x(4000)}{x^2}$ $S = x^2 + \frac{16000}{x}$</p> <p>(c) correct sketch</p> <p>(d) (minimum surface area =) 1200 (cm²) $(x =) 20$ $(y =) 10$</p>	<p>1</p> <p>C</p> <p>1</p> <p>1</p> <p>1 C</p> <p>1</p> <p>1</p> <p>1</p>	<p>C opportunity</p> <p>C opportunity</p>
2	<p>(a) $V = \pi x^2 y (= 4000)$ $S = \pi x^2 + 2\pi xy$ $y = \frac{4000}{\pi x^2}$ or $\pi xy = \frac{4000}{x}$ oe $S = \pi x^2 + 2\pi x \frac{4000}{\pi x^2}$ $S = \pi x^2 + \frac{8000}{x}$</p> <p>(b) correct sketch</p> <p>(c) (minimum surface area =) 1110 (cm²) or better (1107.162...) $(x =) 11$ or better (10.8385...) $(y =) 11$ or better (10.8385...)</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>C</p> <p>1 C</p> <p>1</p> <p>1</p> <p>1</p>	<p>C opportunity</p> <p>C opportunity</p>
3	<p>(a) Multiply by thickness</p> <p>(b) Not uniform thickness or Missing elements of volume }</p>	<p>1</p> <p>1</p>	<p>explanation</p> <p>comment</p>

