

**MARK SCHEME for the October/November 2010 question paper  
for the guidance of teachers**

**0607 CAMBRIDGE INTERNATIONAL MATHEMATICS**

**0607/05**

Paper 5 (Core), maximum raw mark 24

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.

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

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**INVESTIGATION THE FIBONACCI SEQUENCE**

<b>1</b>	<table border="1"> <tr> <td>Term position</td> <td>...</td> <td>12</td> <td>13</td> <td>14</td> <td>15</td> </tr> <tr> <td>Fibonacci number</td> <td>...</td> <td>144</td> <td>233</td> <td><b>377</b></td> <td><b>610</b></td> </tr> </table>	Term position	...	12	13	14	15	Fibonacci number	...	144	233	<b>377</b>	<b>610</b>	2 C1	1 1ft C1 for showing working	ft for 610 – 233 + 'their 377'																		
	Term position	...	12	13	14	15																												
Fibonacci number	...	144	233	<b>377</b>	<b>610</b>																													
<b>2</b>	<p><b>(a)</b></p> <table border="1"> <tr> <td>Term position</td> <td>3</td> <td>6</td> <td>9</td> <td>12</td> </tr> <tr> <td>Fibonacci number</td> <td>2</td> <td>8</td> <td><b>34</b></td> <td><b>144</b></td> </tr> </table> <p><b>(b) (i)</b></p> <table border="1"> <tr> <td>Term position</td> <td>4</td> <td>8</td> <td>12</td> <td><b>16</b></td> </tr> <tr> <td>Fibonacci number</td> <td>3</td> <td><b>21</b></td> <td><b>144</b></td> <td><b>987</b></td> </tr> </table> <p>3 is the 4<sup>th</sup> term... Every 4<sup>th</sup> term...</p> <p><b>(ii)</b></p> <table border="1"> <tr> <td>Term position</td> <td><b>5</b></td> <td><b>10</b></td> <td><b>15</b></td> <td>20</td> </tr> <tr> <td>Fibonacci number</td> <td>5</td> <td>55</td> <td><b>610</b></td> <td>6765</td> </tr> </table> <p>5 is the 5<sup>th</sup> term... Every 5<sup>th</sup> term in the... is a multiple of 5</p> <p><b>(c)</b> Every 6<sup>th</sup> term in the...</p>	Term position	3	6	9	12	Fibonacci number	2	8	<b>34</b>	<b>144</b>	Term position	4	8	12	<b>16</b>	Fibonacci number	3	<b>21</b>	<b>144</b>	<b>987</b>	Term position	<b>5</b>	<b>10</b>	<b>15</b>	20	Fibonacci number	5	55	<b>610</b>	6765	2 1 5 5 1	1 for both in row 1 1 for both in row 2  1 2ft for all 3 in row 2 – 1 eeo  2 for all 3 in row 1 – 1 eeo 1ft  1 1 for both entries	ft from Q1 for 987 – 'their 377' + 'their 610'      ft from Q1 for 'their 610'
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<b>3</b>	<p><b>(a)</b> 5 by 8 rectangle drawn, divided into:  one 5 by 5 square  one 3 by 3 square  one 2 by 2 square  and two 1 by 1 squares</p>	2	If not all correct 1 for any 2 squares shown excluding the two 1 by 1 squares															
	<p><b>(b)</b> 8 by 13 rectangle drawn, divided into:  one 8 by 8 square  one 5 by 5 square  one 3 by 3 square  one 2 by 2 square  and two 1 by 1 squares</p>	2	If not all correct 1 for any 2 squares shown															
	<p><b>(c) (i)</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Size of rectangle</td> <td style="text-align: center;">1 by 1</td> <td style="text-align: center;">1 by 2</td> <td style="text-align: center;">2 by 3</td> <td style="text-align: center;">3 by 5</td> <td style="text-align: center;">5 by 8</td> <td style="text-align: center;">8 by 13</td> </tr> <tr> <td style="text-align: center;">Least number of squares</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> </tr> </table>	Size of rectangle	1 by 1		1 by 2	2 by 3	3 by 5	5 by 8	8 by 13	Least number of squares	1	2	3	4	5	6	1	1 for all 4 entries
	Size of rectangle	1 by 1	1 by 2		2 by 3	3 by 5	5 by 8	8 by 13										
	Least number of squares	1	2		3	4	5	6										
<p><b>(ii)</b> 8</p>	1																	
<p><b>(iii)</b> 89 144</p>	2	1 each																
<p><b>(d)</b> <math>n - 1</math></p>	1																	
			<b>[Total: 24 + C1 = 25 scaled to 24]</b>															