

**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.

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INVESTIGATION THE FIBONACCI SEQUENCE

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|--|---------------|------------|------------|------------|-----------|------------------|------------------|-----|-----------|------------|---------------|------------|---------|------------------------------------|--------------------------------|------------------|---|-----------|------------|------------|---------------|----------|-----------|-----------|----|------------------|---|----|------------|------|-----------------------|---|--|
| 1 | <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>377</td> <td>610</td> </tr> </table> | Term position | ... | 12 | 13 | 14 | 15 | Fibonacci number | ... | 144 | 233 | 377 | 610 | 2 C1 | 1 1ft C1 for showing working | ft for 610 – 233 + 'their 377' | | | | | | | | | | | | | | | | | | |
| | Term position | ... | 12 | 13 | 14 | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fibonacci number | ... | 144 | 233 | 377 | 610 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | <p>(a)</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>34</td> <td>144</td> </tr> </table> <p>(b) (i)</p> <table border="1"> <tr> <td>Term position</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> </tr> <tr> <td>Fibonacci number</td> <td>3</td> <td>21</td> <td>144</td> <td>987</td> </tr> </table> <p>3 is the 4th term... Every 4th term...</p> <p>(ii)</p> <table border="1"> <tr> <td>Term position</td> <td>5</td> <td>10</td> <td>15</td> <td>20</td> </tr> <tr> <td>Fibonacci number</td> <td>5</td> <td>55</td> <td>610</td> <td>6765</td> </tr> </table> <p>5 is the 5th term... Every 5th term in the... is a multiple of 5</p> <p>(c) Every 6th term in the...</p> | Term position | 3 | 6 | 9 | 12 | Fibonacci number | 2 | 8 | 34 | 144 | Term position | 4 | 8 | 12 | 16 | Fibonacci number | 3 | 21 | 144 | 987 | Term position | 5 | 10 | 15 | 20 | Fibonacci number | 5 | 55 | 610 | 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' |
| Term position | 3 | 6 | 9 | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fibonacci number | 2 | 8 | 34 | 144 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Term position | 4 | 8 | 12 | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fibonacci number | 3 | 21 | 144 | 987 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Term position | 5 | 10 | 15 | 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fibonacci number | 5 | 55 | 610 | 6765 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|---------------|---------------------------------------|-----------------|--------------|
| Page 3 | Mark Scheme: Teachers' version | Syllabus | Paper |
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|--------------------------------------|--|-------------------|---|--|--------|--------|--------|---------|---------|-------------------------|---|---|---|---|---|---|---|---------------------|
| 3 | <p>(a) 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) 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>(c) (i)</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">Size of rectangle</td> <td style="padding: 2px;">1 by 1</td> <td style="padding: 2px;">1 by 2</td> <td style="padding: 2px;">2 by 3</td> <td style="padding: 2px;">3 by 5</td> <td style="padding: 2px;">5 by 8</td> <td style="padding: 2px;">8 by 13</td> </tr> <tr> <td style="padding: 2px;">Least number of squares</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">4</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;">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>(ii) 8</p> | 1 | | | | | | | | | | | | | | | | | |
| <p>(iii) 89 144</p> | 2 | 1 each | | | | | | | | | | | | | | | | |
| <p>(d) $n - 1$</p> | 1 | | | | | | | | | | | | | | | | | |
| | | | [Total: 24 + C1 = 25 scaled to 24] | | | | | | | | | | | | | | | |