UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

8541720444

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/05**

Paper 5 (Core) **October/November 2013**

1 hour

Candidates answer on the Question Paper

Additional Materials: Graphics Calculator

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
Do not use staples, paper clips, highlighters, glue or correction fluid.
You may use a pencil for any diagrams or graphs.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** the questions.
You must show all relevant working to gain full marks for correct methods, including sketches.
In this paper you will also be assessed on your ability to provide full reasons and communicate your mathematics clearly and precisely.
At the end of the examination, fasten all your work securely together.
The total number of marks for this paper is 24.

This document consists of **6** printed pages and **2** blank pages.

Answer **all** the questions.

INVESTIGATION SUMS OF SEQUENCES

Here is the method to construct a sequence for this investigation.

Method	Example
Write down any two numbers for the first two terms.	3 and 7
Add these two terms to make the third term.	3 + 7 = 10
Add the second and third terms to make the fourth term.	7 + 10 = 17
Add the third and fourth terms to make the fifth term.	10 + 17 = 27
Continue in this way to construct the sequence.	

This example makes the sequence: 3, 7, 10, 17, 27, 44, ...

1 Show that the sum of the first six terms in this sequence, divided by the fifth term, is 4.

2 **(a)** The first two terms of a new sequence are 272 and 412.

(i) Use the method to write down the next four terms in this sequence.

272, 412, ..., ..., ..., ...

(ii) Work out the sum of the first six terms in this sequence and divide it by the fifth term.

.....

(b) The first two terms of another sequence are 4.52 and 16.9 .

(i) Use the method to write down the next four terms in this sequence.
Do not round any of your numbers.

4.52, 16.9, ... , ... , ... , ...

(ii) Work out the sum of the first six terms in this sequence and divide it by the fifth term.

.....

(c) **(i)** Choose two negative numbers to be the first two terms of a sequence.

Use the method to work out the next four terms in this sequence.
Write down the first six terms in your sequence.

..... , ... , ... , ... , ... , ...

(ii) Work out the sum of the first six terms in your sequence and divide it by the fifth term.

.....

(d) Describe the connection between the fifth term and the sum of the first six terms in each of these sequences.

.....

.....

3 The first two terms of a new sequence are p and q.
The table shows the working for the first five terms.

Working	Term
p	p
q	q
$p \quad + \quad q$	$p + q$
$q \quad + \quad p + q$	$p + 2q$
$p + q \quad + \quad p + 2q$	$2p + 3q$

(a) Complete the table.

(b) Find an expression for the sum of these first six terms.
Simplify your answer.

.....

(c) Find an equation to connect the fifth term and the sum of the first six terms.

.....

4 **(a)** 3, 7, 10, 17, 27, 44, ...

(i) Write down the next four terms in this sequence.

3, 7, 10, 17, 27, 44, ... , ... , ... , ...

(ii) Work out the sum of the first ten terms in this sequence and divide it by the seventh term.

.....

(b) **(i)** Find the next four terms in the sequence in **question 3**.

7^{th} term .....

8^{th} term .....

9^{th} term .....

10^{th} term .....

(ii) Find an expression for the sum of the first ten terms in this sequence.
Simplify your answer.

.....

(iii) Find an equation to connect the seventh term and the sum of the first ten terms.

.....

5 **(a)** Find the next four terms in the sequence in **question 4(b)**.

11^{th} term .....

12^{th} term .....

13^{th} term .....

14^{th} term .....

(b) Find an expression for the sum of the first fourteen terms.
Simplify your answer.

.....

(c) This sum is a multiple of one of the terms in **question 4(b)(i)**.
Find this multiple.

.....

(d) Describe this connection using algebra.

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