UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/05**

Paper 5 (Core) **October/November 2011**

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.

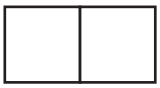
At the end of the examination, fasten all your work securely together.
The total number of marks for this paper is 24.

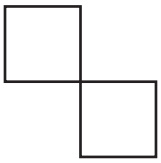
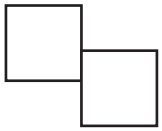
This document consists of **6** printed pages and **2** blank pages.

Answer **all** questions.

INVESTIGATION **MAXIMISING THE PERIMETER**

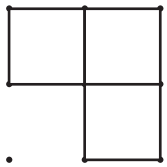
Identical shapes can be joined to make larger shapes.

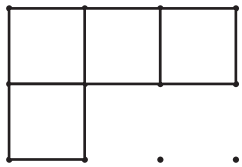
1 Squares of side 1 cm may be joined edge to edge, for example 

but **not** like this.  

(a) The diagram below shows a shape made of 3 squares and a shape made of 4 squares.

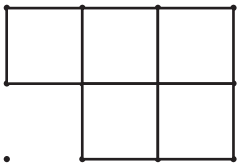
Draw a different shape made of 3 squares and a different shape made of 4 squares.





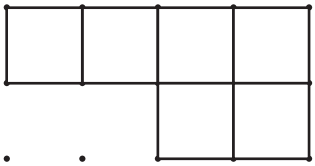
(b) **(i)** The diagram below shows a shape, made of 5 squares, with a perimeter of 10 cm.

Draw two different shapes each made of 5 squares and each with a perimeter **greater** than 10 cm.



(ii) The diagram below shows a shape, made of 6 squares, with a perimeter of 12 cm.

Draw two different shapes each made of 6 squares and each with a perimeter **greater** than 12 cm.



(c) Find the **greatest** perimeter for shapes made of

(i) 4 squares,

..... cm

(ii) 5 squares,

..... cm

(iii) 6 squares.

..... cm

You may use the grid below to draw your shapes.

(d) **(i)** Complete this table.

Number of squares	2	3	4	5	6	7	8	9	10
Greatest perimeter (cm)	6					16			22

(ii) Write down the greatest perimeter for a shape made of 17 squares.

..... cm

(iii) How many squares make the shape when the greatest perimeter is 32 cm?

.....

(e) Look at your table to help you complete the following statements.

(i) To find the greatest perimeter for a shape made of 2 squares,

multiply 2 by 2, then add .....

(ii) To find the greatest perimeter for a shape made of 7 squares,

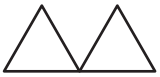
multiply 7 by ....., then add .....

(f) Write down an expression, in terms of x, for the greatest perimeter for a shape made of x squares.

.....

2 Equilateral triangles of side 1 cm may be joined edge to edge, for example

but **not** like this.



(a) Find the greatest perimeter for a shape made of 6 equilateral triangles.

..... cm

You may use the grid below to help you.

(b) **(i)** Complete this table.

Number of equilateral triangles	2	3	4	5	6	7	8
Greatest perimeter (cm)	4						10

(ii) Write down the greatest perimeter for a shape made of 10 equilateral triangles.

..... cm

(iii) How many equilateral triangles make the shape when the greatest perimeter is 18 cm?

.....

(c) Write down an expression, in terms of x, for the greatest perimeter for a shape made of x equilateral triangles.

.....

3 Find an expression, in terms of x, for the greatest perimeter for a shape made of x regular hexa

.....

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