

## UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

	CANDIDATE NAME		
	CENTRE NUMBER		CANDIDATE NUMBER
* 4 9 2 4	CAMBRIDGE II Paper 5 (Core)	NTERNATIONAL MATHEMATICS	0607/05 October/November 2011
094545	Candidates ans Additional Mate	wer on the Question Paper rials: Graphics Calculator	1 hour

#### **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.

2

### 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.

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	• • •										

(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.

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		Draw than 12	two d 2 cm.	ifferen	t shap	es each	made	of 6	squares	s and	each	with a	perim	leter	greater	Examiner's Use
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(c)	Fine	d the <b>gr</b>	eatest	perim	eter for	r shapes	made	of								
	(i)	4 squa	res,												cm	
	(ii)	5 squa	res,												cm	
	(iii)	6 squa	res.													
	Υοι	ı mav u	se the	grid be	elow to	o draw y	our sha	ipes.							cm	
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(d) (i) Complete this table.

				_		_	0	0	10	
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.										
(iii) How many squares make the shape when the greatest perimeter is 32 cm?										
(e) Look at your table to h	elp you	comple	te the fo	llowing	stateme	ents.				
(i) To find the greater	st perim	eter for	a shape	made o	f 2 squa	ares,				
multiply 2 by 2, th	en add									
(ii) To find the greater	st perim	eter for	a shape	made o	f 7 squa	ires,				
multiply 7 by			, then a	dd						
(f) Write down an expression of x squares.	ession,	in term	us of <i>x</i> ,	, for th	e great	æst per	imeter	for a s	shape mad	

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



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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.

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

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