

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

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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.

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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.

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	(ii)			m below										cm.	great
		Draw than 1	two	different	shapes	each	made	of 6	squares	s and	each	with	a perii	neter	great
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(c)	Fino	d the g	reates	st perime	ter for s	hapes	made	of							
()	(i)	4 squ		1		1									
	(ii)	5 squ	oros											••••••	cm
	(11)	J squ	arcs,												cm
	(iii)	6 squ	ares.												cm
	You	ı may ı	ise th	e grid bel	low to d	raw y	our sha	ipes.							
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(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.
	(iii)	How many squares make the shape when the greatest perimeter is 32 cm?
(e)	Loo	k 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)		te down an expression, in terms of x , for the greatest perimeter for a shape made squares.

Equ	ıilateı	al tria	ngles	of si	ide 1	cm r	nay l	oe jo	ineo	d edge	e to	edge,	for ex	ample	e			\sum		PAIR
but	not 1	ike this	S.		_	<u>\</u>	\wedge	7			7	$\overline{\ \ }$								
(a)	Fino	d the gr	reates	t pe	rimet	er fo	r a sl	hape	ma	de of	6 e	quilat	eral tri	angle	s.					
																			•••••	cm
	You	ı may ı	ise th	e gri	id bel	low t	o he	lp yc	ou.											
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(b)	(i)	Comp	olete t	his t	able.															
	Νι	ımber	of equ	iilate	eral t	riang	gles	2	2	3		4	5		6	7		8		
	Gr	eatest]	perim	eter	(cm))		2	4									10		
	(ii)	Write	dow	n the	e grea	atest	perin	nete	r fo	r a sha	ape	made	of 10	equila	atera	l tria	ngles			
																			•••••	. cm
	(iii)	How	many	equ	ilateı	ral tr	iangl	es m	nake	the s	hap	e whe	en the g	greate	st pe	erime	ter is	18 c	m?	
(c)	Wri of <i>x</i>	te dov equila	vn ar teral	n ex trian	apress Igles.	sion,	in	term	ıs c	of x,	foi	the	greates	st pe	rime	ter f	or a	sha	pe 1	nade
																			•••••	

regular hexa man ser's con

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

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