

2009 School Certificate Test
Mathematics

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Centre Number

Section 2 (continued)

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Student Number

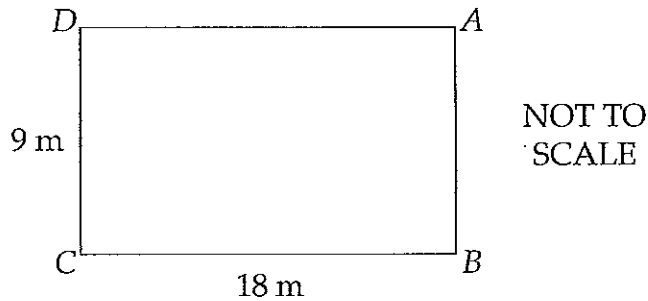
Part B

Questions 81–84 20 marks

Answer the questions in the spaces provided.

Question 81 (5 marks)

A rectangular area is to be tiled using square tiles.



- (a) The cost to lay the tiles is \$4050. What is the cost per square metre? 1

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- (b) Tiles measuring 300 mm × 300 mm are to be used to cover this area.

- (i) Complete: 300 mm = m. 1

- (ii) Show, with calculations, that 30 tiles will fit along side CD. 1

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- (iii) The tiler buys enough tiles to cover the whole area plus an extra 10% to allow for breakages. Show, with calculations, that the tiler buys a total of 1980 tiles. 2

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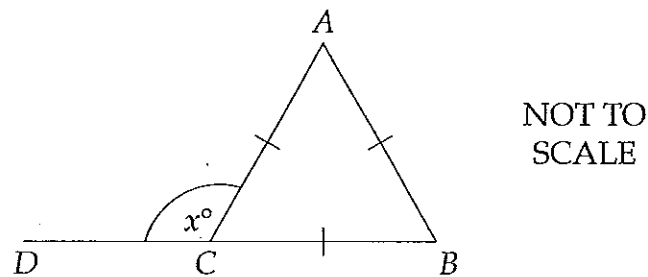
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Question 82 (5 marks)

(a) Consider the information in the following diagram.

2



Maria correctly found the value of x , giving reasons.

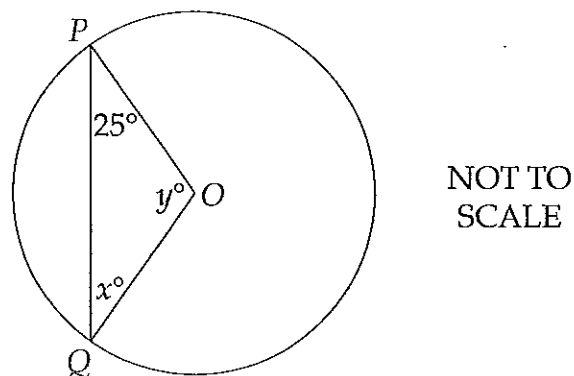
Complete her solution.

$\angle ACB = 60^\circ$, (Angles in an triangle)

$\therefore x = 120$ (.....)

(b)

3



O is the centre of this circle.

Roger was asked to find the value of x and y , giving reasons.

Complete his solution.

$OP = OQ$ (equal radii of circle)

$\therefore x = \dots\dots\dots$ (base angles of isosceles triangle)

$\therefore y = \dots\dots\dots$ (.....)

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Mathematics

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Centre Number

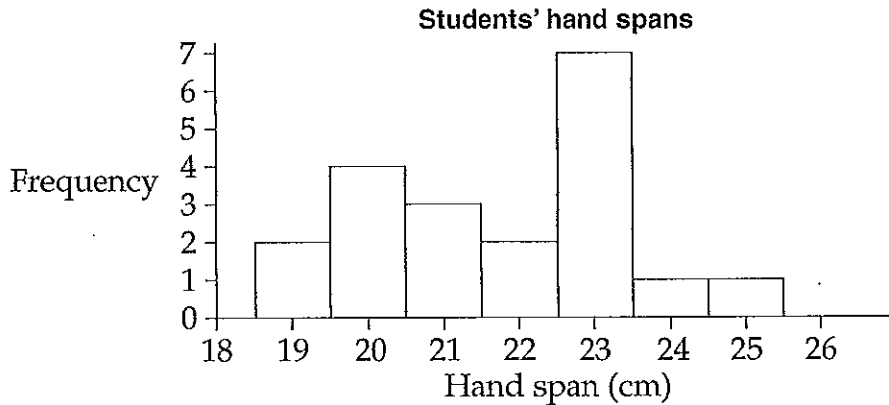
Section 2 – Part B (continued)

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Student Number

Question 83 (5 marks)

The hand spans of students in a class were measured. The results are displayed in the frequency histogram below.



(a) Draw the frequency polygon on the frequency histogram above. 1

(b) What is the range of the measurements of the hand spans? 1

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(c) A glove manufacturer finds this sample is representative of the population. 1

Would the mean, median or mode be the most useful measure to the glove manufacturer?

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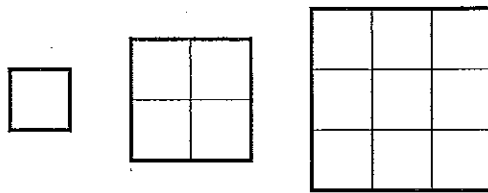
(d) The mean hand span is 21.75 cm. When the teacher's hand span is included, the total length of all the hand spans is 462 cm. 2

By first stating the number of students in the class show, by calculations, that the teacher's hand span is 27 cm.


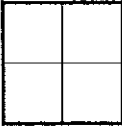
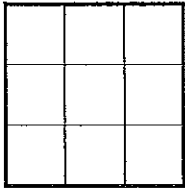
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Question 84 (5 marks)

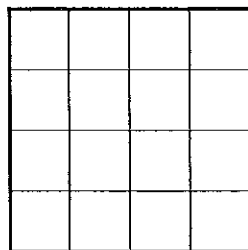
A pattern of designs is formed using squares.



The number of squares of different size in each design is shown in the table below.

	<i>Design</i>	<i>Number of different sized squares</i>	<i>Numerical expression</i>
1		1	1^2
2		5	$1^2 + 2^2$
3		14	$1^2 + 2^2 + 3^2$

- (a) How many squares of different size are in the fourth design in this pattern? 1



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Question 84 continues on page 35

Question 84 (continued)

- (b) A design has 91 squares of different size. 1

What is the side length of its largest square?

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- (c) The difference in the number of squares in two consecutive designs is 400. 1

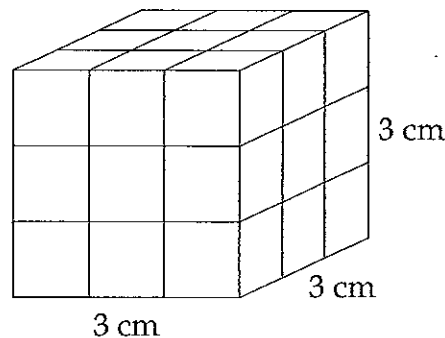
What is the side length of the smaller of these two designs?

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- (d) Now consider a 3 cm cube made of unit cubes with sides of 1 cm. 1



How many cubes of different size are there in this cube?

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- (e) Find an expression for the total number of cubes of all sizes in a cube of side length n centimetres. 1

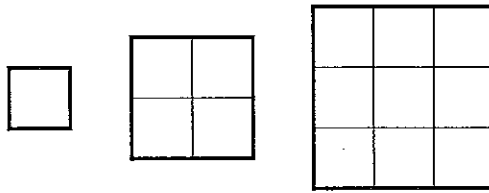
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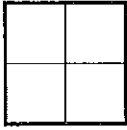
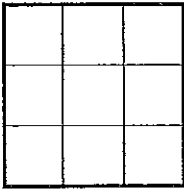
End of test

Question 84 (5 marks)

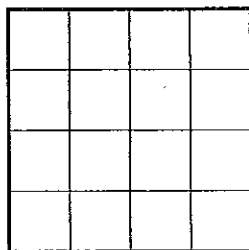
A pattern of designs is formed using squares.



The number of squares of different size in each design is shown in the table below.

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1		1	1^2
2		5	$1^2 + 2^2$
3		14	$1^2 + 2^2 + 3^2$

- (a) How many squares of different size are in the fourth design in this pattern? 1



30

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Question 84 continues on page 35

Question 84 (continued)

- (b) A design has 91 squares of different size. 1

What is the side length of its largest square?

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- (c) The difference in the number of squares in two consecutive designs is 400. 1

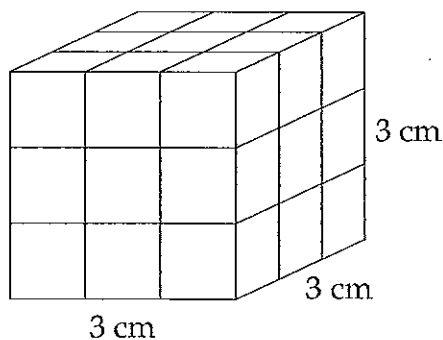
What is the side length of the smaller of these two designs?

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- (d) Now consider a 3 cm cube made of unit cubes with sides of 1 cm. 1



How many cubes of different size are there in this cube?

..... 14

.....

- (e) Find an expression for the total number of cubes of all sizes in a cube of side length n centimetres. 1

..... $1^3 + 2^3 + 3^3 + \dots + n^3$

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End of test