OCR
Oxford Cambridge and RSA

F

Thursday 11 June 2015 – Afternoon

GCSE METHODS IN MATHEMATICS

B392/01 Methods in Mathematics 2 (Foundation Tier)

4856120053

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Scientific or graphical calculator
- Geometrical instruments
- Tracing paper (optional)

Duration: 1 hour 30 minutes

B392/01

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

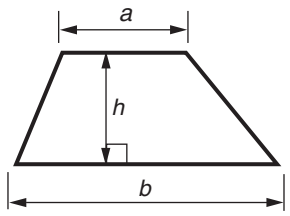
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Quality of written communication will be assessed in questions marked with an asterisk (*****).
- The total number of marks for this paper is **90**.
- This document consists of **20** pages. Any blank pages are indicated.

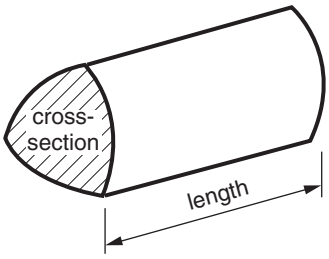
You are permitted to use a calculator for this paper

Formulae Sheet: Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = (area of cross-section) × length



PLEASE DO NOT WRITE ON THIS PAGE

Answer **all** the questions.

1 **(a)** The first three terms of a sequence are 5000, 1000 and 200.
The term-to-term rule is 'divide by 5'.

Work out the next two terms of this sequence.

(a) 5000, 1000, 200, ..., ... **[1]**

(b) This is the start of another sequence.

1, 3, 6, 10, 15

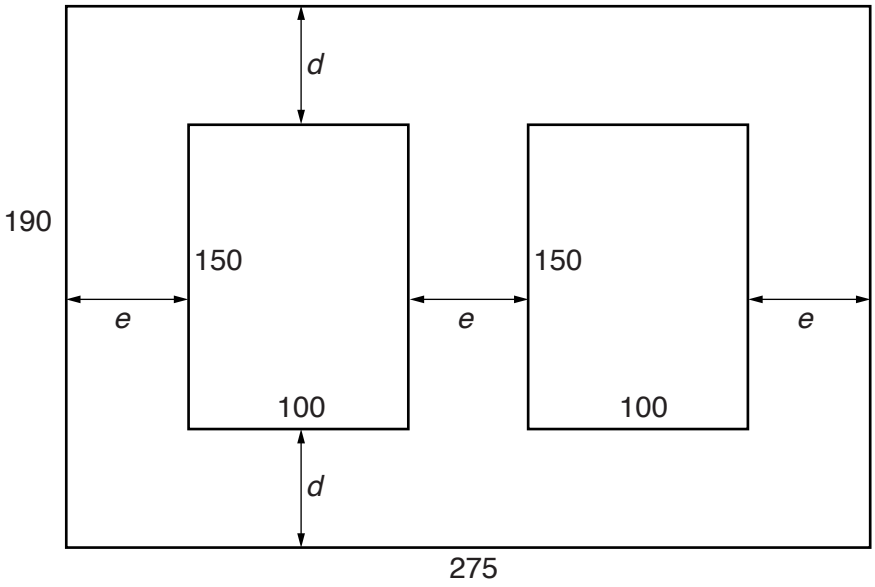
(i) Work out the next two terms of this sequence.

(b)(i) 1, 3, 6, 10, 15, ..., ... **[2]**

(ii) What is the special name for the numbers in this sequence?

(ii) ..... **[1]**

2 Jules wants to arrange two pictures in a frame.
Each picture is a rectangle 100 mm by 150 mm.
The frame is a rectangle 275 mm by 190 mm.



Not to scale

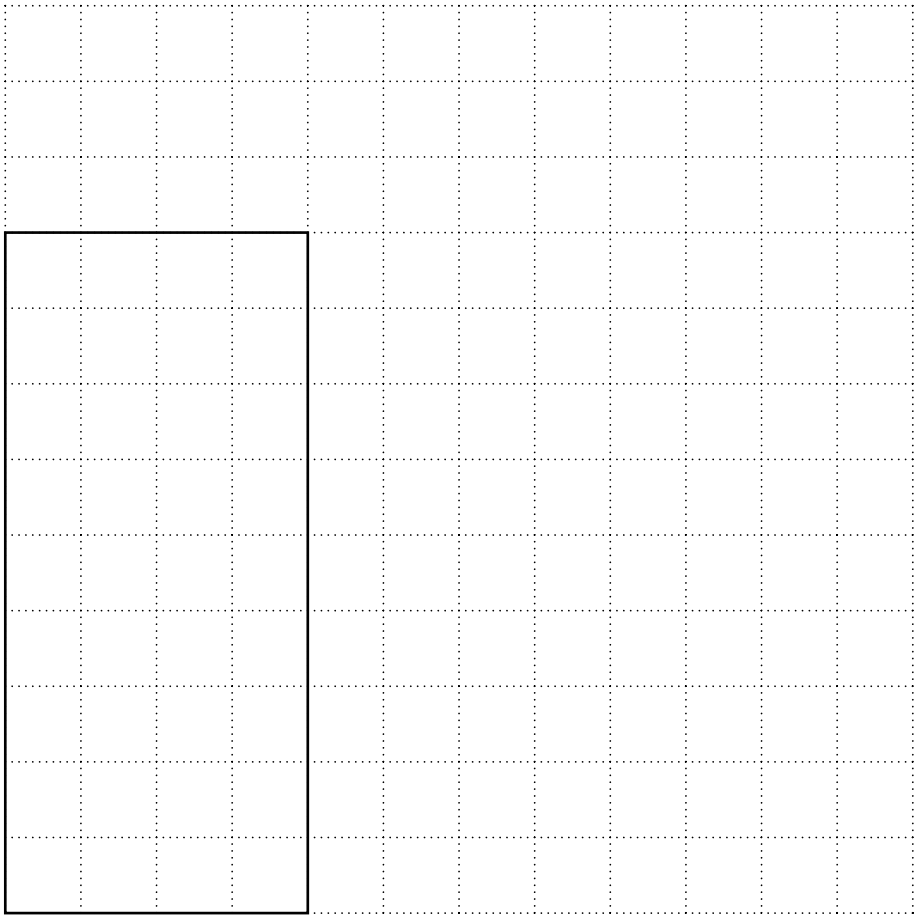
The two lengths *d* are equal.
The three lengths *e* are equal.

Work out the lengths *d* and *e*.

d = ... mm **[2]**

e = ... mm **[2]**

3 This rectangle is drawn on a one-centimetre grid.



(a) Work out the perimeter of the rectangle.

(a) ..... cm **[1]**

(b) (i) Work out the area of the rectangle.

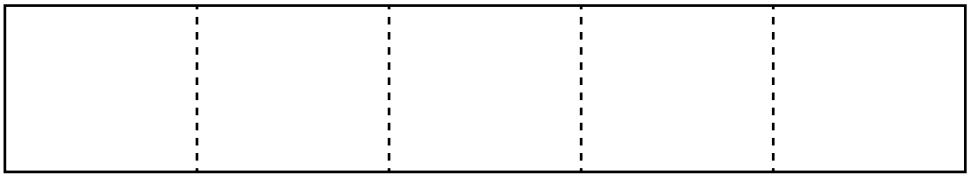
(b)(i) ..... cm^2 **[1]**

(ii) A square has the **same area** as the rectangle.

Work out the perimeter of the square.

(ii) ..... cm **[2]**

4 **(a)** Shade 60% of this rectangle.



[1]

(b) Complete the following.

(i) 25% of £84 = £ ..... **[2]**

(ii) 10% of ..... = 45p **[2]**

5 Alice buys some teas and some coffees.
She buys 5 drinks.
A coffee costs £1.80 and a tea costs £1.35.
She spends a total of £7.65.

(a) How many coffees and how many teas does she buy?

(a) ..... coffees, ... teas **[2]**

(b)* Alice gives the assistant a £10 note to pay for the drinks.
The assistant gives Alice the correct change using the smallest possible number of coins.

Which coins does the assistant give to Alice?

..... **[2]**

6 **(a)** Complete these statements.

(i) ..... ÷ 100 = 3.4 **[1]**

(ii) 5 × ..... = 1 **[1]**

(b) **(i)** Maya works out this calculation.

$25 + 18 \times 3$

Her answer is 129.
This is wrong.

What should the answer be?

(b)(i) ..... **[1]**

(ii) Choose from +, –, × and ÷ to complete the following.

45 ..... 3 ..... 8 = 21

[1]

(c) A pile of 8 identical textbooks weighs 5.2 kg.

What will a pile of 12 of these textbooks weigh?

(c) ..... kg **[2]**

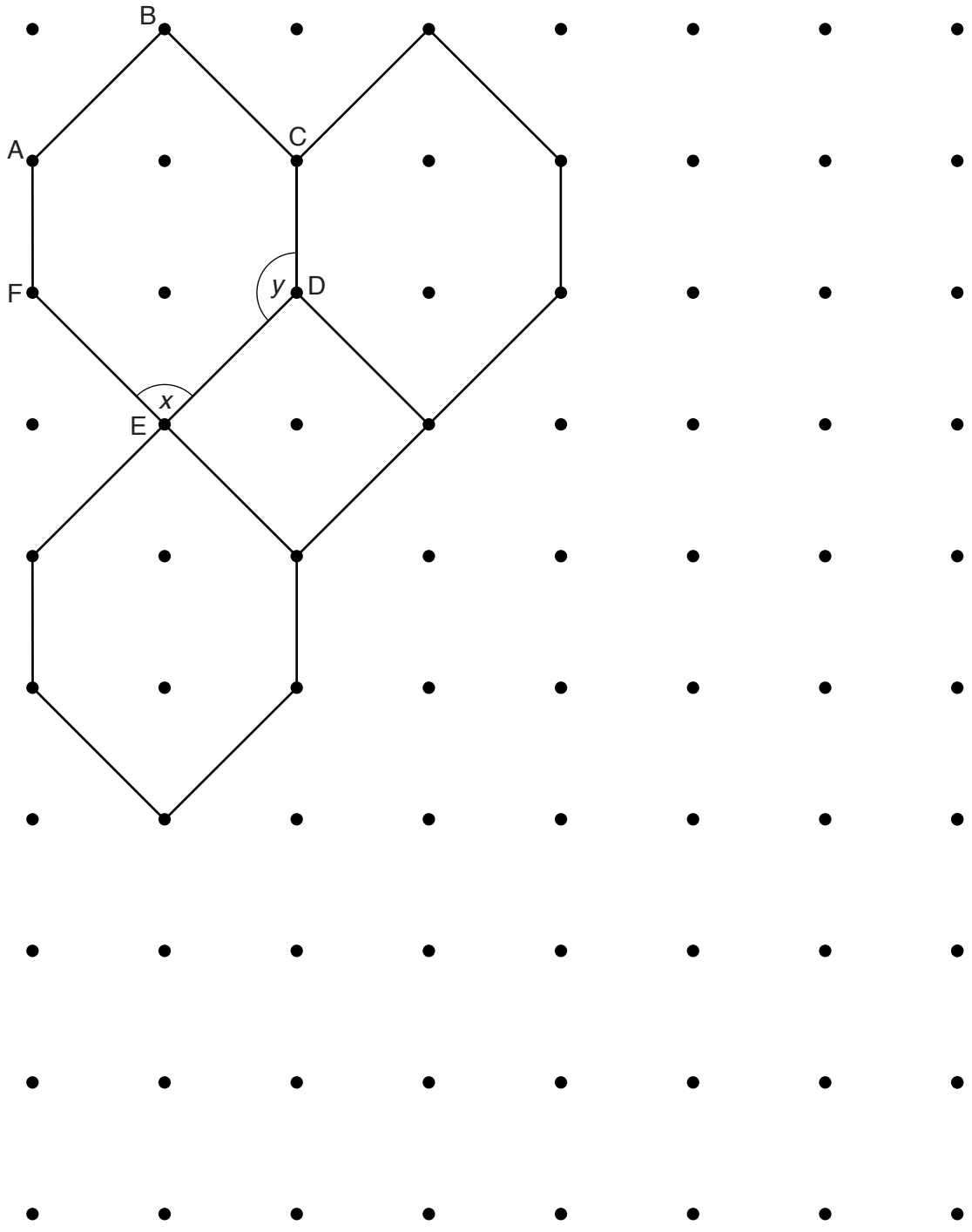
7

n is a positive integer *and* $2n \leqslant 10$ *and* $n + 1 > 3$

Find all the possible values of n.

..... **[3]**

8 This tessellation of hexagons and squares has been started on square dotty paper.



(a) Continue this tessellation pattern. You should draw at least three more hexagons and three more squares. **[2]**

(b) The hexagon ABCDEF in the tessellation has two angles x and y marked.

(i) Write down the value of x.

(b)(i) $x =$ .....° **[1]**

(ii) Work out the value of y. Show your calculations.

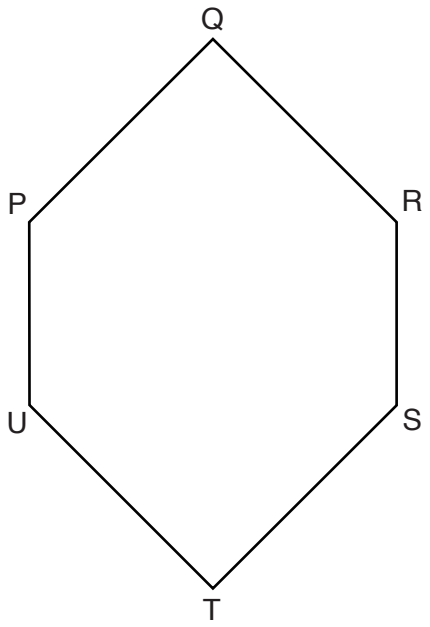
(ii) $y =$ .....° **[2]**

(c) The perimeter of hexagon ABCDEF is 15.314 cm correct to 3 decimal places.
The length CD is 2 cm.

(i) **Calculate** the length DE. Write your answer correct to 1 decimal place.

(c)(i) ..... cm **[3]**

(ii) Hexagon PQRSTU is **similar** to hexagon ABCDEF.
The length RS is 6 cm.



Not to scale

Calculate the perimeter of hexagon PQRSTU.

(ii) ..... cm **[2]**

9 The floor area of a clothes shop is allocated to different departments.

40% women's clothes
30% men's clothes
25% children's clothes

The remaining area is allocated for general use. This area is 28 m^2.

Work out the **total** floor area of the shop.

..... m^2 **[3]**

10 Alex has 20 red counters and 16 blue counters in a bag.

(a) Write the ratio of the number of red counters to the number of blue counters in its simplest form.

(a) ..... **[2]**

(b) Alex removes some red counters from the bag.
The ratio of the number of red counters to the number of blue counters is now 1 : 2.

How many red counters did Alex remove?

(b) ..... **[2]**

11 Solve.

(a) $5x = 35$

(a) ..... **[1]**

(b) $x - 9 = 7$

(b) ..... **[1]**

(c) $2(x + 3) = 16$

(c) ..... **[2]**

12 Pratik and Rhys both play chess. This table is a record of the number of games they each played and the number of games they each won.

Name	Number of games played	Number of games won
Pratik	20	15
Rhys	25	19

(a) What percentage of his games did Pratik win?

(a) ..... % **[2]**

(b) Which player won a greater percentage of games?
You must justify your answer.

.....

..... **[2]**

13 **(a)** This formula is used to work out the circumference, C cm, for a circle with diameter d cm.

$$C = \pi d$$

(i) Rearrange the formula to make d the subject.

(a)(i) $d =$ ..... **[1]**

(ii) A circle has circumference 60 cm.

Work out the diameter of the circle.
[*If your calculator does not have a* π *button, use* $\pi = 3.142$.]

(ii) ..... cm **[2]**

(b) This formula is used to work out the radius, r cm, for a circle with area A cm^2.

$$r = \sqrt{\frac{A}{\pi}}$$

A different circle has area 91.6 cm^2.

Work out the radius of this circle.
[*If your calculator does not have a* π *button, use* $\pi = 3.142$.]

(b) ..... cm **[2]**

14 **(a)** Use your calculator to work these out.

(i) $^{-}21 + 311$

(a)(i) ..... **[1]**

(ii) $^{-}21 \times 311$

(ii) ..... **[1]**

(b) Andrea is working without a calculator.
She works out $1215 \div 6$ and gets the answer 22.5.

Show the working for one way that Andrea could check her answer without using a calculator.

.....

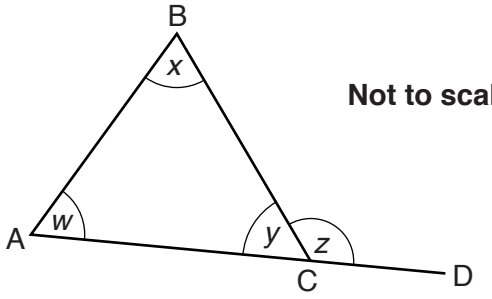
.....

..... **[1]**

(c) Write $1.\dot{3}$ as a fraction.

(c) ..... **[2]**

15 (a) In the diagram below, triangle ABC has side AC continued to D.



There are errors in the following proof.

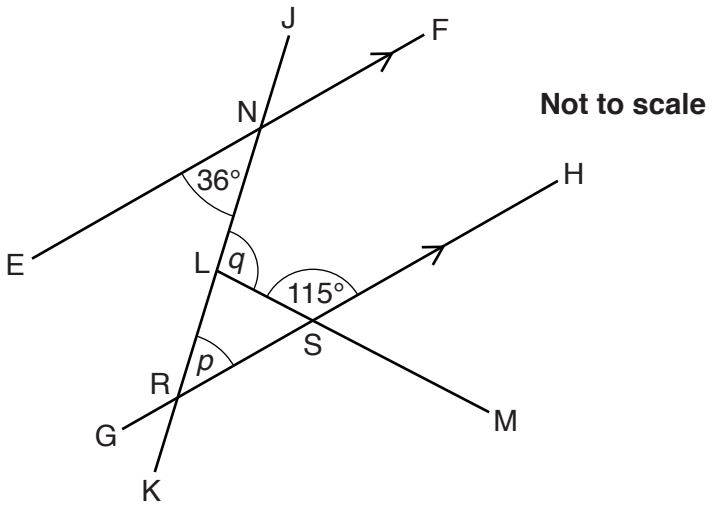
$w + x + y = 180°$ (angle sum of a triangle is 180°) $w + y + z = 180°$ (angles on a straight line add up to 180°) So $w + x = z$ Exterior angle of a triangle is equal to the sum of the opposite interior angles.

Tick the box to show which line contains the **first** error.

☐	The first line	☐	The second line
☐	The third line	☐	The fourth line

[1]

(b)* The diagram below consists of four straight lines. EF and GH are parallel.



Calculate angles *p* and *q*, giving a geometrical reason for each step in your working.

.....

.....

.....

.....

..... **[4]**

16 **(a)** Write down the missing terms in the following sequence.

3, 5, 7, ..., 11, ..., 15,

[1]

(b) Write an expression for the *n*th term of the sequence in part **(a)**.

(b) ..... **[2]**

(c)* 3 and 5 are both terms in the sequence.
3 x 5 = 15. 15 is also a term in the sequence.

Show that the product of **any** two terms in the sequence will also be a term in the sequence.

.....

.....

.....

.....

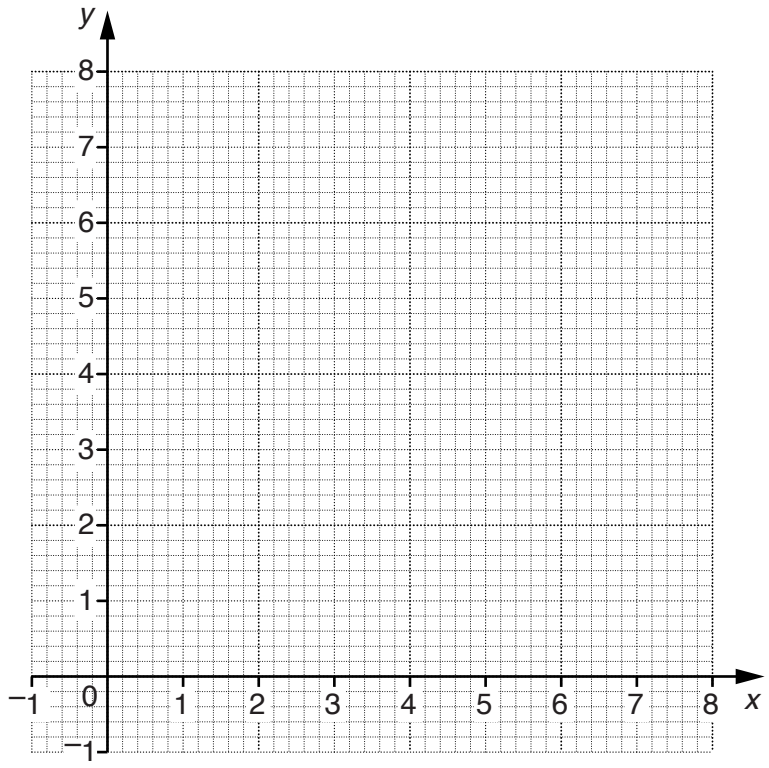
..... **[2]**

17 Two positive numbers, x and y, add up to make 8.

(a) Write an equation to show this relationship between x and y.

(a) ..... **[1]**

(b) On the grid below, draw a graph which shows all possible pairs of values of x and y.



[2]

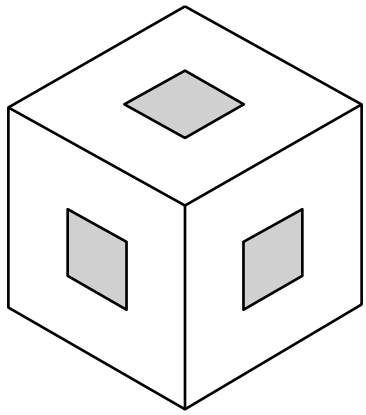
(c) It is also known that y is three times x.

By drawing a suitable additional line on the grid, find the values of x and y.

(c) x ....., y ..... **[4]**

18 The diagram below shows a cube of side 6 cm.

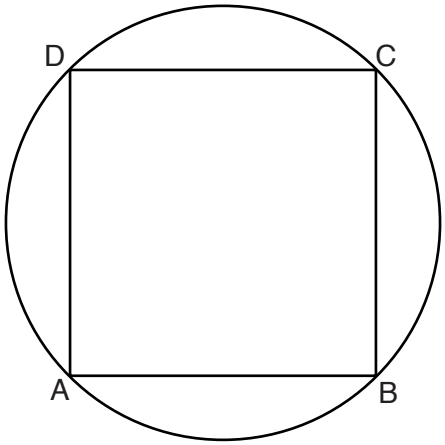
Square holes, of side 2 cm, have been drilled through the cube, between the middles of pairs of opposite sides.



Find the volume of the shape that is left.

..... cm^3 **[4]**

19 ABCD is a square.
A circle passes through all the points A, B, C and D.
The centre of the circle is at the centre of the square.



The area of square ABCD is 36 cm^2.

What is the radius of the circle?

..... cm **[4]**

END OF QUESTION PAPER

BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

PLEASE DO NOT WRITE ON THIS PAGE