Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
TOTAL	

General Certificate of Secondary Education
Foundation Tier
June 2010

Mathematics (Modular) (Specification B) Module 5

43055/1F

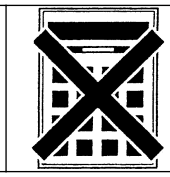
F

Paper 1 Non-calculator

Monday 7 June 2010 1.30 pm to 2.45 pm

For this paper you must have:
- mathematical instruments.

You may **not** use a calculator.



Time allowed
- 1 hour 15 minutes

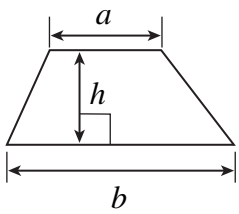
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 70.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

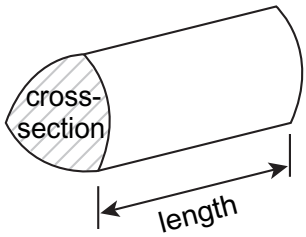
Advice
- In all calculations, show clearly how you work out your answer.

Formulae Sheet: Foundation Tier

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

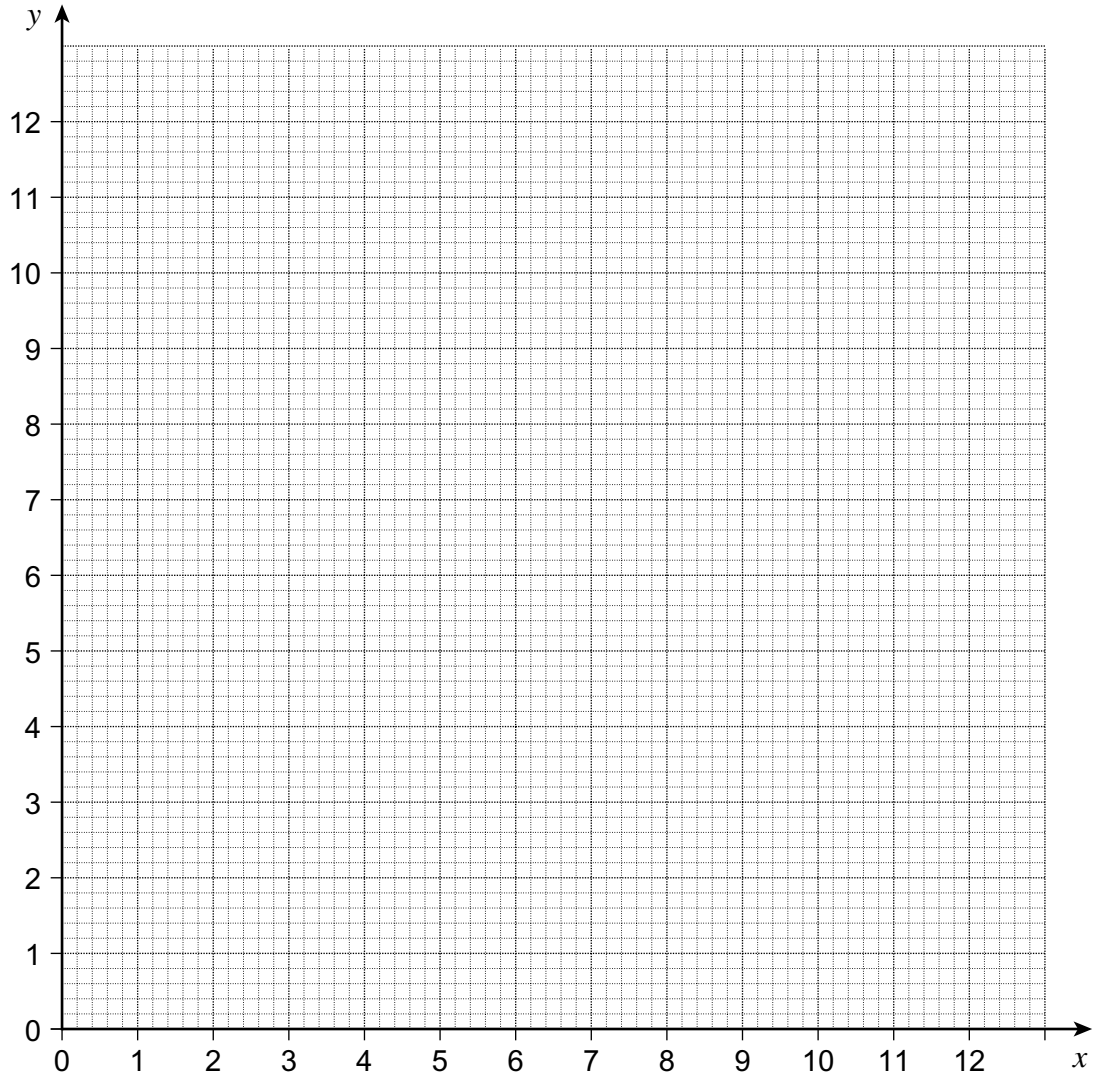


Volume of prism = area of cross-section $\times$ length



Answer **all** questions in the spaces provided.

1 (a) Plot the points $A(1, 4)$, $B(3, 9)$, $C(7, 11)$, $D(12, 8)$ and $E(6, 1)$.



(2 marks)

1 (b) Join the points to form shape $ABCDE$.

(1 mark)

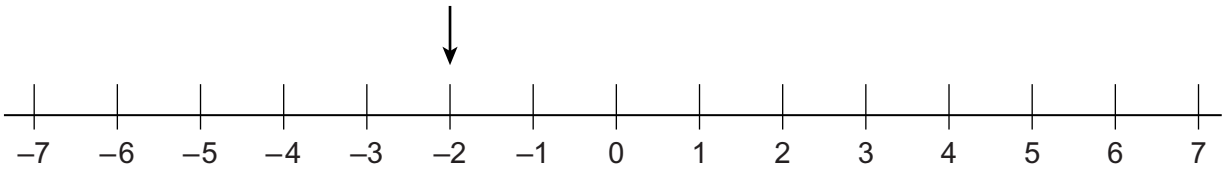
1 (c) Write down the mathematical name of shape $ABCDE$.

Answer ..... *(1 mark)*

4

Turn over ▶

2 Here is a number line.
The arrow is pointing at –2.



2 (a) Draw an arrow pointing at the number that is 7 greater than –2.
Label it A.

(1 mark)

2 (b) Draw another arrow pointing at the number that is 4 less than –2.
Label it B.

(1 mark)

3 Complete the table by putting each of the following numbers in the correct box.

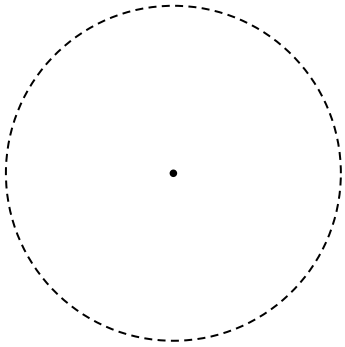
4 10 30 36 49 125

	Square number	**Multiple of 5**
Odd number		
Factor of 20		
Multiple of 6		

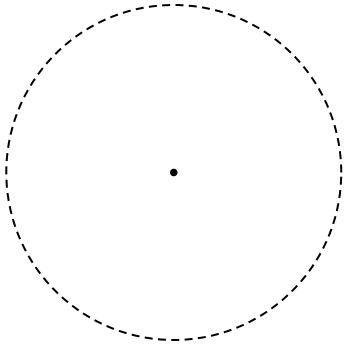
(4 marks)

4 (a) On the circles, draw

a radius

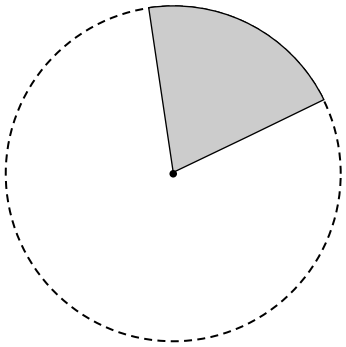


an arc

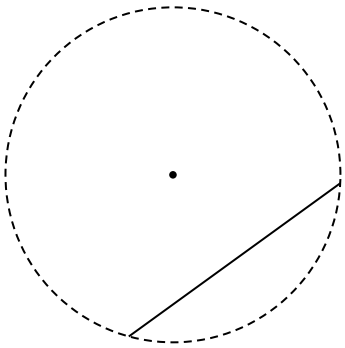


(2 marks)

4 (b) Complete the sentences.



The shaded area is a .....



The straight line is a .....

(2 marks)

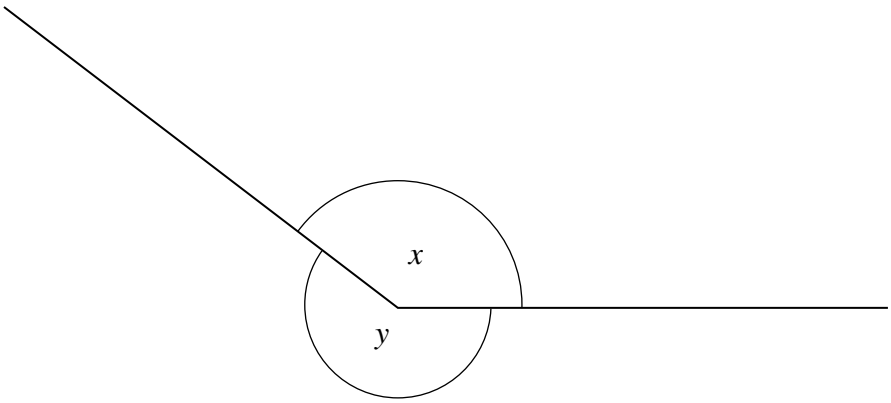
10

Turn over ▶

5 (a) In the space below, draw a line 8.4 cm long.

(1 mark)

5 (b) (i) Measure the angle marked x.



Answer ..... degrees *(1 mark)*

5 (b) (ii) Explain how you could use your answer to part (i) to work out the size of the angle marked y.

.....

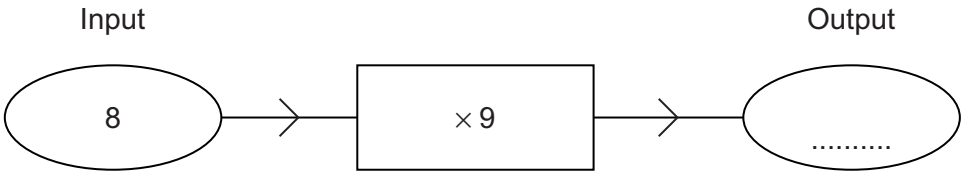
.....

.....

(1 mark)

6 (a) Here is a number machine.

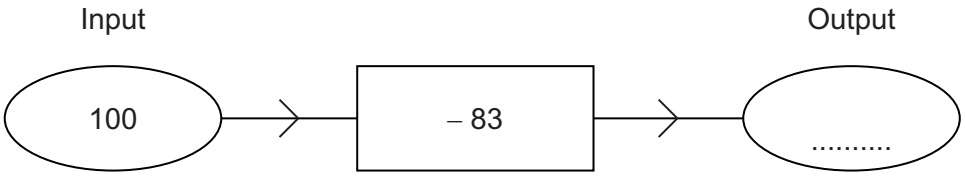
Work out the output.



(1 mark)

6 (b) Here is a different number machine.

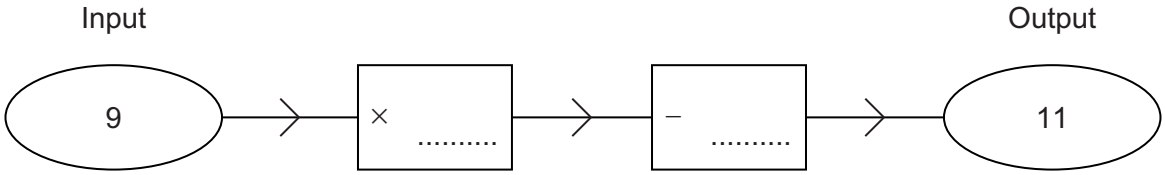
Work out the output.

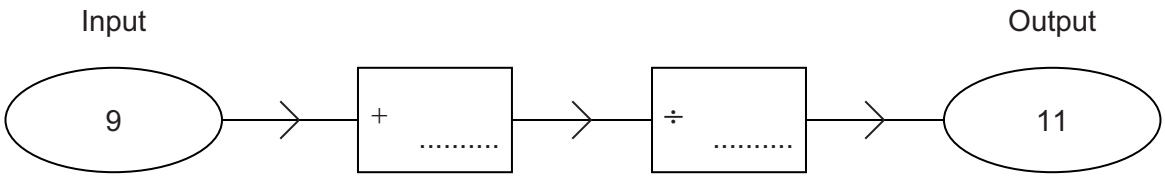


(1 mark)

6 (c) Here are another two number machines.
They both have an input of 9 and an output of 11.

Complete each number machine to make it work.





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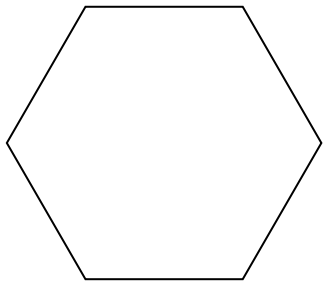
(2 marks)

7

Turn over ▶

7 (a) The diagram shows a regular hexagon.



7 (a) (i) By measuring the length of one side, work out the perimeter.

.....

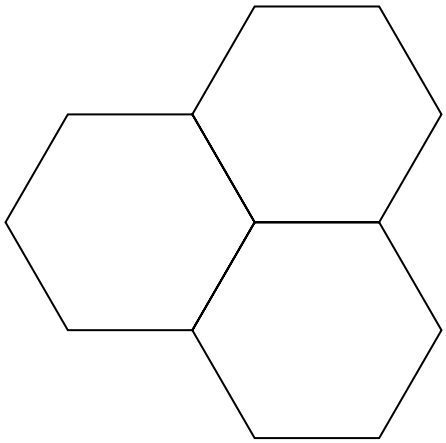
.....

Answer ..... cm *(2 marks)*

7 (a) (ii) On the diagram above draw in all the lines of symmetry.

(2 marks)

7 (b) Three regular hexagons are joined together as shown.



Not drawn accurately

Work out the size of an interior angle of a regular hexagon.

.....

.....

Answer ..... degrees *(2 marks)*

8 (a) Each term of this sequence is double the previous term.
Fill in the missing numbers.

…… 40 80 …… 320

(2 marks)

8 (b) (i) Fill in the missing number in this sequence.

120 60 30 …… 7.5

(1 mark)

8 (b) (ii) When this sequence is continued, will any of the numbers be negative?
Give a reason for your answer.

☐ Yes ☐ No

Reason .....

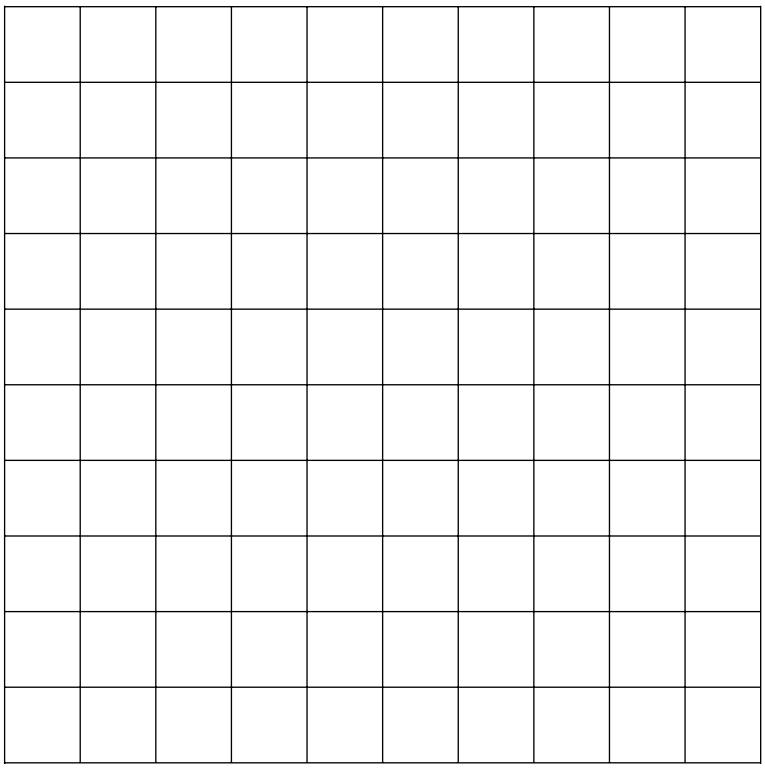
.....

(1 mark)

Turn over for the next question

10

9 (a) On the centimetre grid, draw a net of a cube with edges of length 2 cm.



(2 marks)

9 (b) Work out the surface area of the cube.

.....

.....

.....

Answer ..... cm^2 *(2 marks)*

10 Here is a formula in words.

Area = length multiplied by width

Here is the same formula using symbols.

$$A = l \times w$$

10 (a) Here is a different formula in words.

Volume = one-third of the area multiplied by the height

Write this formula using numbers and symbols.

.....

.....

Answer ..... *(2 marks)*

10 (b) Make w the subject of the formula $A = l \times w$

.....

Answer w = ... *(1 mark)*

Turn over for the next question

7

11 The diagram shows an algebra addition table.
The total for each row and column is given.

x	x	x	12
x	x	$2y$	10
$2x$	$3y$	z	16
16	11	11	

Work out the values of x, y and z.

.....

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Answer x = ... , y = ... , z = ... *(5 marks)*

12 (a) Work out the value of $\frac{1}{2}x - 3y$ when $x = 10$ and $y = 2$

.....

.....

Answer ..... *(2 marks)*

12 (b) Write down the value of abc when $a = 10$, $b = 2$ and $c = 0$

Answer ..... *(1 mark)*

13 (a) Write 1000 as a power of 10.

Answer ..... *(1 mark)*

13 (b) Here is a sequence.

10 1000 100 000 10 000 000

Rewrite these four terms using powers of 10.

Answer ..... , ... , ... , ... *(2 marks)*

13 (c) Write down the next term in this sequence.

Answer ..... *(1 mark)*

14 (a) Solve $5a + 3a = 16$

.....

Answer a = ... *(1 mark)*

14 (b) Solve $\frac{x}{3} + 5 = 9$

.....

.....

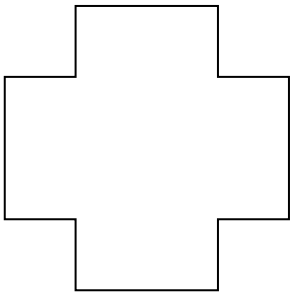
.....

Answer x = ... *(2 marks)*

Turn over for the next question

15

15 The diagram shows a cross.
All angles in the shape are made from right angles.
The length of each long side is double the length of each short side.
The length of each short side is 5 cm.



Not drawn accurately

15 (a) Work out the area of the cross.
State the units of your answer.

.....

.....

.....

Answer ..... *(4 marks)*

15 (b) Work out the perimeter of the cross.

.....

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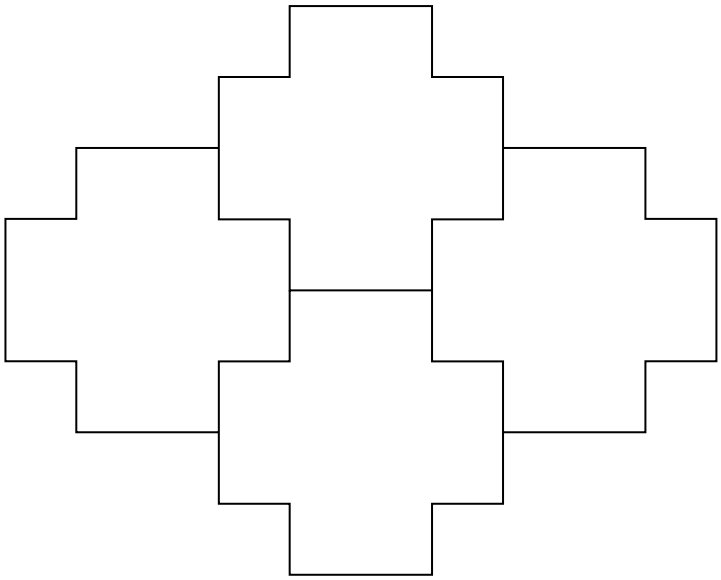
Answer ..... cm *(2 marks)*

15 (c) A shape is made by fitting together four of the cross shapes as shown.



Not drawn accurately

Explain why the perimeter of this shape is **not** four times the perimeter of one cross.

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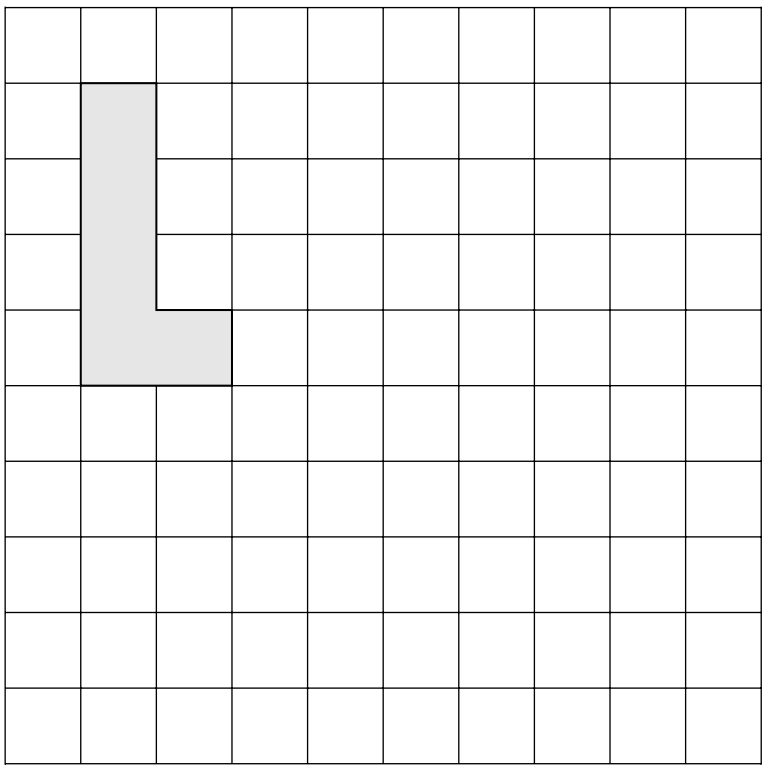
(1 mark)

Turn over for the next question

7

16 (a) The L-shape has an area of $5\,cm^2$.



Work out the area of the L-shape after an enlargement of scale factor 2.

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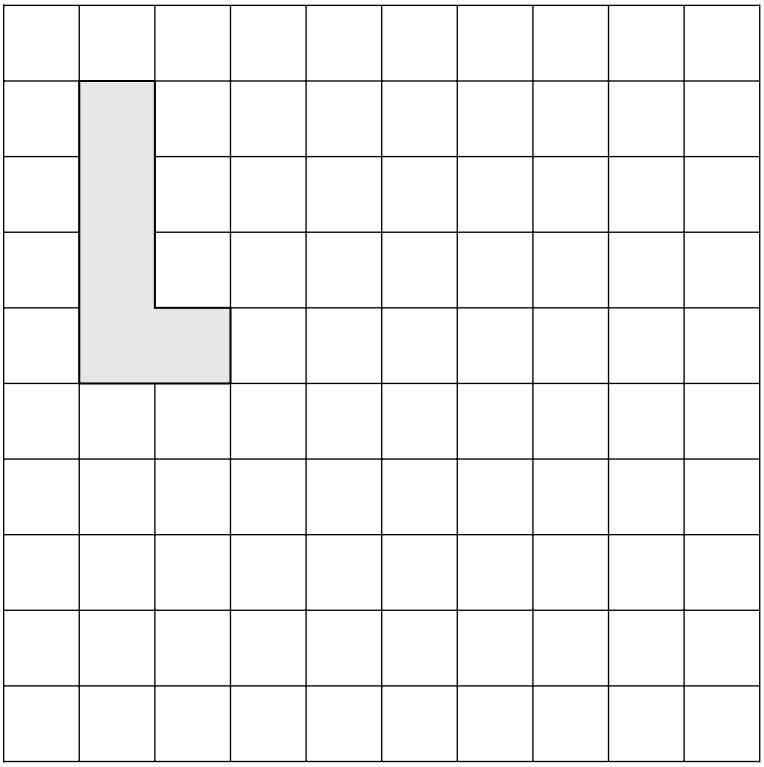
Answer ..... cm^2 *(2 marks)*

16 (b) Rotate the L-shape by a quarter turn clockwise.
Mark with a cross your centre of rotation.

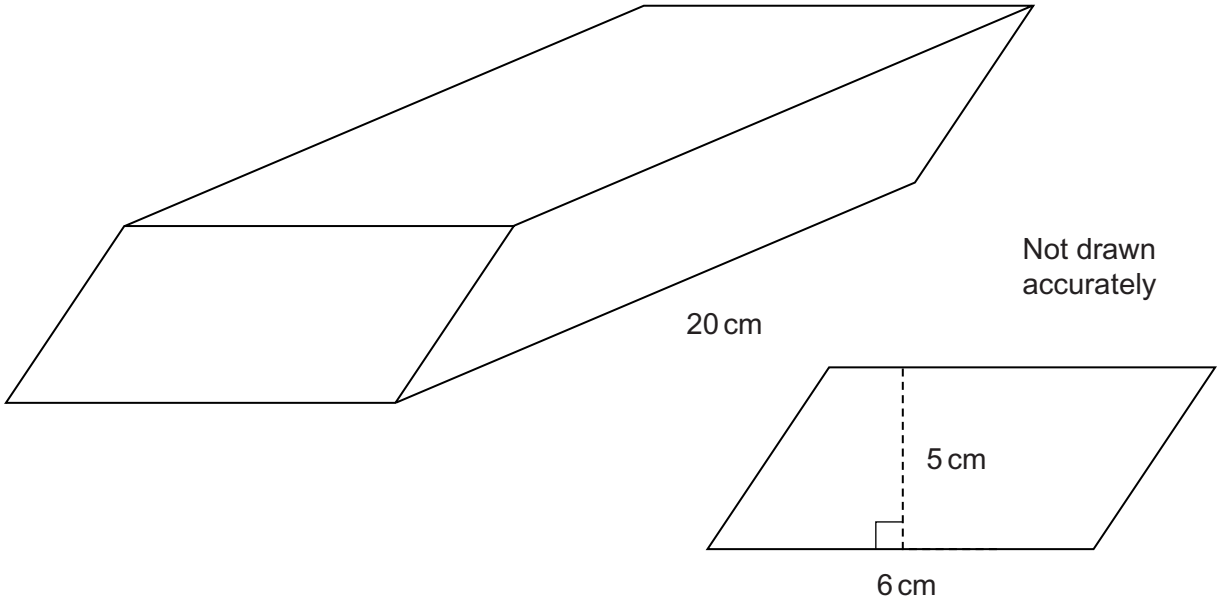


(3 marks)

Turn over for the next question

5

17 The diagram shows a prism of length 20 cm.
The cross-section is a parallelogram as shown.



Work out the volume of the prism.

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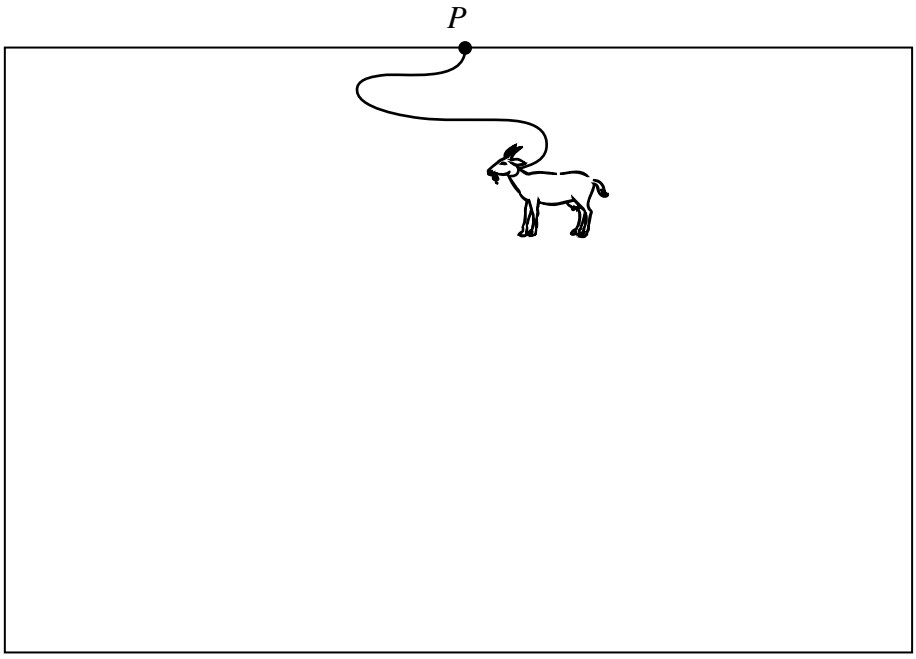
.....

Answer ..... cm^3 *(3 marks)*

18 The diagram shows a rectangular grass field of length 30 metres and width 20 metres.
A post, P, is in the middle of one side of the field.
A goat is tied to the post by a rope of length 7.5 metres.
The goat can reach half a metre further than the length of the rope.

Not drawn accurately



Describe fully the shape of the area of grass that the goat can eat.

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(2 marks)

END OF QUESTIONS

5

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED