

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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



General Certificate of Secondary Education  
Foundation Tier  
November 2010

# Mathematics (Modular) (Specification B) Module 5

**43055/2F**

**F**

**Paper 2 Calculator**

**Friday 12 November 2010 9.00 am to 10.15 am**

<p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>• a calculator</li> <li>• mathematical instruments.</li> </ul>	
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### 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.
- Use a calculator where appropriate.
- Do all rough work in this book.
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be 3.14 unless another value is given in the question.

### 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. This must be tagged securely to this answer booklet.

### Advice

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



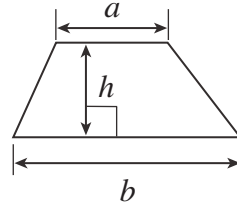
N 0 V 1 0 4 3 0 5 5 2 F 0 1

WMP/Nov10/43055/2F

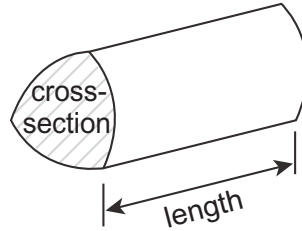
**43055/2F**

**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 Write a number in each box to make the fractions equivalent.

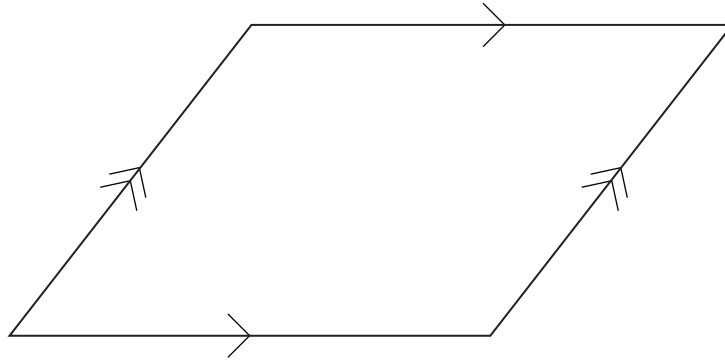
$$\frac{\square}{3} = \frac{2}{6} = \frac{\square}{12}$$

.....

.....

(2 marks)

- 2 A quadrilateral is drawn accurately below.



Tick a box to show whether each statement is true or false.

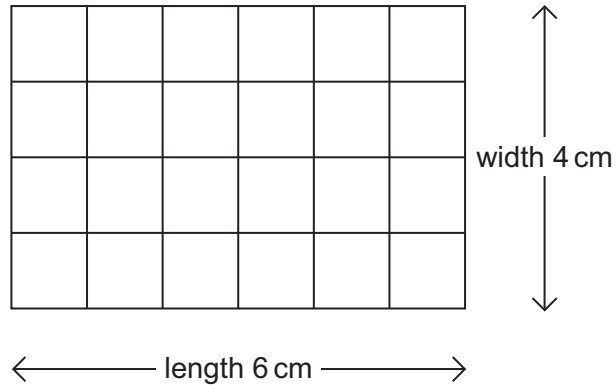
	True	False
Opposite sides are parallel.	<input type="checkbox"/>	<input type="checkbox"/>
One side is 4 cm long.	<input type="checkbox"/>	<input type="checkbox"/>
One angle is 59°.	<input type="checkbox"/>	<input type="checkbox"/>
The quadrilateral is a rhombus.	<input type="checkbox"/>	<input type="checkbox"/>

(4 marks)



3 (a) Rectangles are made using 24 identical square tiles.

Here is one example.



3 (a) (i) Write down the length and width of **two** other examples.

.....

.....

length ..... cm

length ..... cm

width ..... cm

width ..... cm

(2 marks)

3 (a) (ii) Why is it **not** possible to make a square using all 24 tiles?

.....

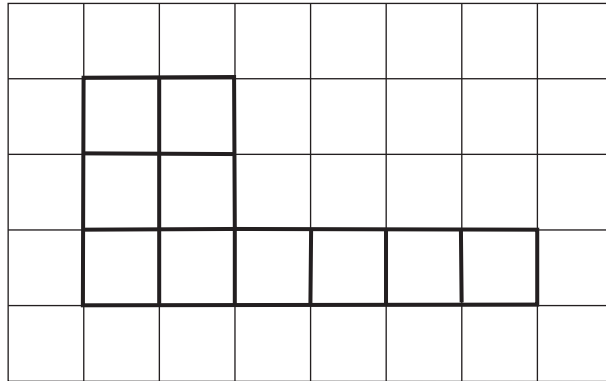
.....

(1 mark)



**3 (b)** This shape is made using 10 tiles.

It is drawn on a centimetre grid.

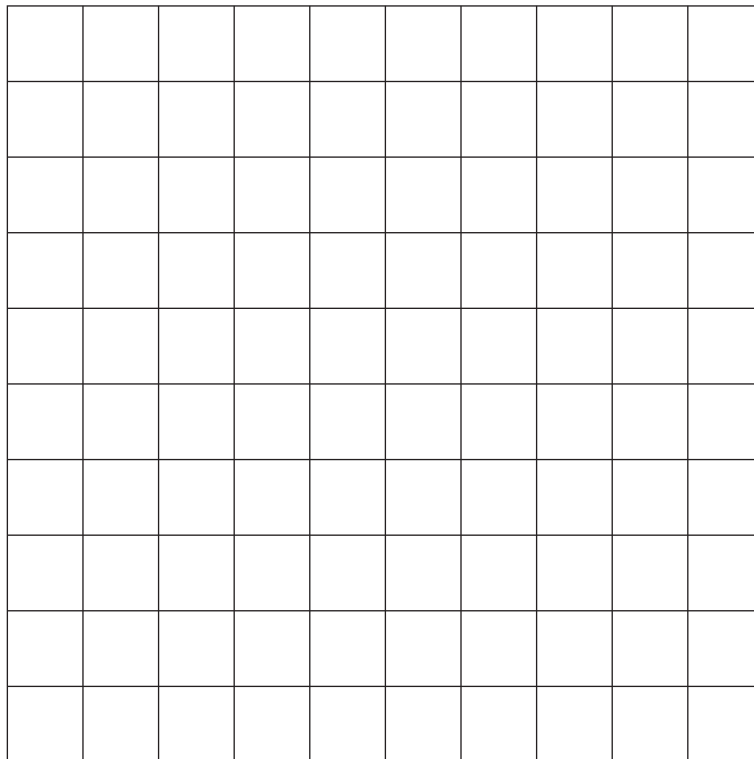


**3 (b) (i)** Work out the perimeter of the shape.

.....

Answer ..... cm (2 marks)

**3 (b) (ii)** Use all 10 tiles to make a shape that has a perimeter of 14 cm.



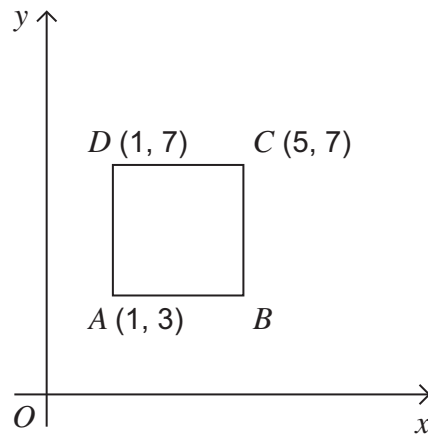
(2 marks)

7
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Turn over ►



- 4**  $ABCD$  is a square.  
 $AB$  is parallel to the  $x$ -axis.



Not drawn accurately

- 4 (a)** Work out the coordinates of  $B$ .

.....

Answer ( ..... , ..... ) (1 mark)

- 4 (b)** Work out the length of  $AD$ .

.....

Answer ..... units (1 mark)

- 4 (c)** Work out the area of the square.

.....

Answer ..... square units (1 mark)



5 The number of hours sleep needed by a child is given by this formula.

$$\text{Number of hours sleep needed} = \frac{30 - \text{age of child in years}}{2}$$

5 (a) Use the formula to work out the number of hours sleep needed for

5 (a) (i) Suki, who is six years old

.....

.....

Answer ..... hours (2 marks)

5 (a) (ii) George, who is a new born baby.

.....

.....

Answer ..... hours (1 mark)

5 (b) Mark needs 13 hours sleep.

Use the formula to work out Mark's age.

.....

.....

.....

Answer ..... years (2 marks)



6 When  $x = 8$  and  $y = 4$  work out the value of

6 (a)  $2x + 3y$

.....  
.....

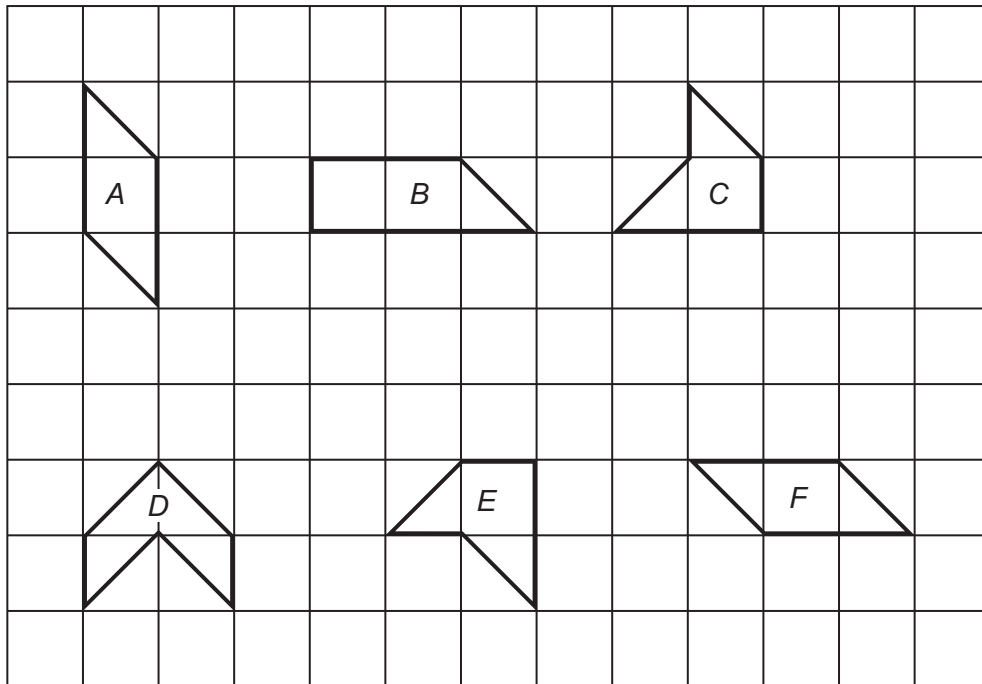
Answer ..... (2 marks)

6 (b)  $\frac{x}{y}$

.....  
.....

Answer ..... (1 mark)

7 Shapes are drawn on a centimetre grid.





7 (a) Write down the letters of **two** shapes that are congruent.

Answer ..... and ..... (1 mark)

7 (b) Write down the letters of another **two** shapes that are congruent.

Answer ..... and ..... (1 mark)

7 (c) Write down the letter of the shape that is a hexagon.

Answer ..... (1 mark)

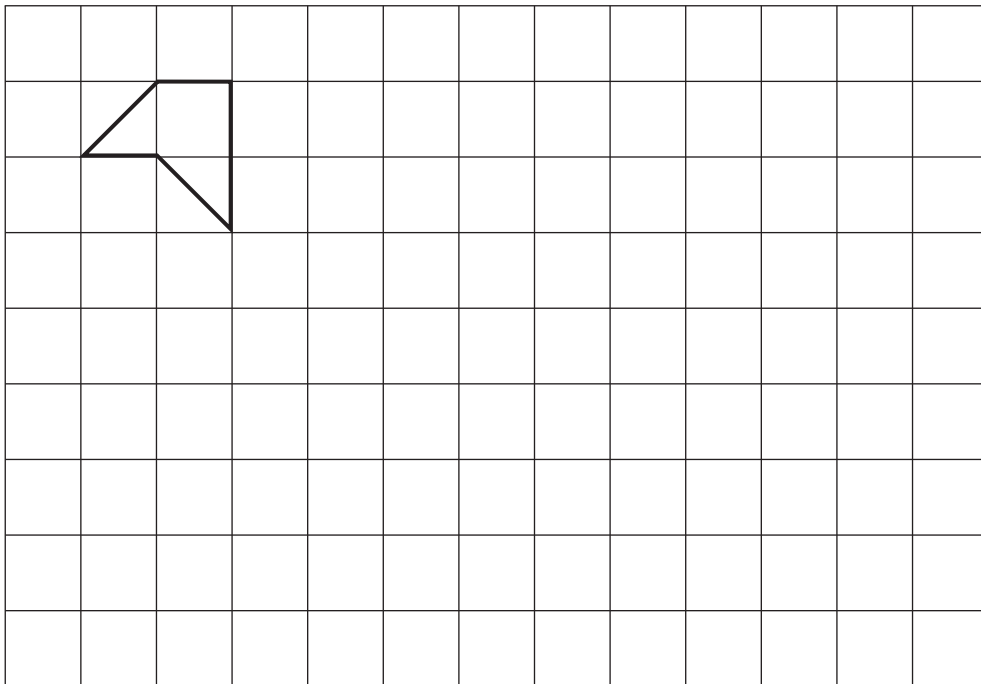
7 (d) Write down the letter of the shape that is a trapezium.

Answer ..... (1 mark)

7 (e) Write down the letter of the shape that has one line of symmetry.

Answer ..... (1 mark)

7 (f) Enlarge this shape by scale factor 2.



(2 marks)



**8 (a)** Solve  $w - 3 = 0$

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

**8 (b)** Solve  $\frac{1}{2}x = 6$

.....

Answer  $x =$  ..... (1 mark)

**8 (c)** Solve  $2y + 5 = 14$

.....

.....

.....

Answer  $y =$  ..... (2 marks)



9 These patterns are made from sticks.

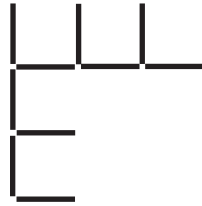
Pattern 1



Pattern 2



Pattern 3



9 (a) Draw pattern 4.

(1 mark)

9 (b) Complete the table.

<b>Pattern</b>	1	2	3	4	5
<b>Number of sticks</b>	3	7	11		

(2 marks)

9 (c) Write an expression for the number of sticks in pattern  $n$ .

.....

.....

Answer ..... (2 marks)



**10** Here are four statements about triangles.

Decide whether each one is always true, sometimes true or never true.  
Circle your answers.

**10 (a)** All three sides of a triangle are equal in length.

always true

sometimes true

never true

(1 mark)

**10 (b)** The angles of a triangle add up to  $180^\circ$ .

always true

sometimes true

never true

(1 mark)

**10 (c)** One of the angles of a triangle is obtuse.

always true

sometimes true

never true

(1 mark)

**10 (d)** A triangle has rotational symmetry of order 2.

always true

sometimes true

never true

(1 mark)



11 Complete each statement using the symbols + − × ÷

An example has been done for you.

$$6e \quad \boxed{+} \quad 2e \quad \boxed{-} \quad 5e = 3e$$

11 (a)  $4a \quad \boxed{\phantom{+}} \quad 2a \quad \boxed{\phantom{-}} \quad 3a = 9a$

.....  
(1 mark)

11 (b)  $g \quad \boxed{\phantom{+}} \quad h = gh$

.....  
(1 mark)

11 (c)  $7b \quad \boxed{\phantom{+}} \quad 8c \quad \boxed{\phantom{-}} \quad 6b \quad \boxed{\phantom{+}} \quad 5c = 13b - 3c$

.....  
(2 marks)

11 (d)  $y^5 \quad \boxed{\phantom{+}} \quad y^2 = y \quad \boxed{\phantom{-}} \quad y^2$

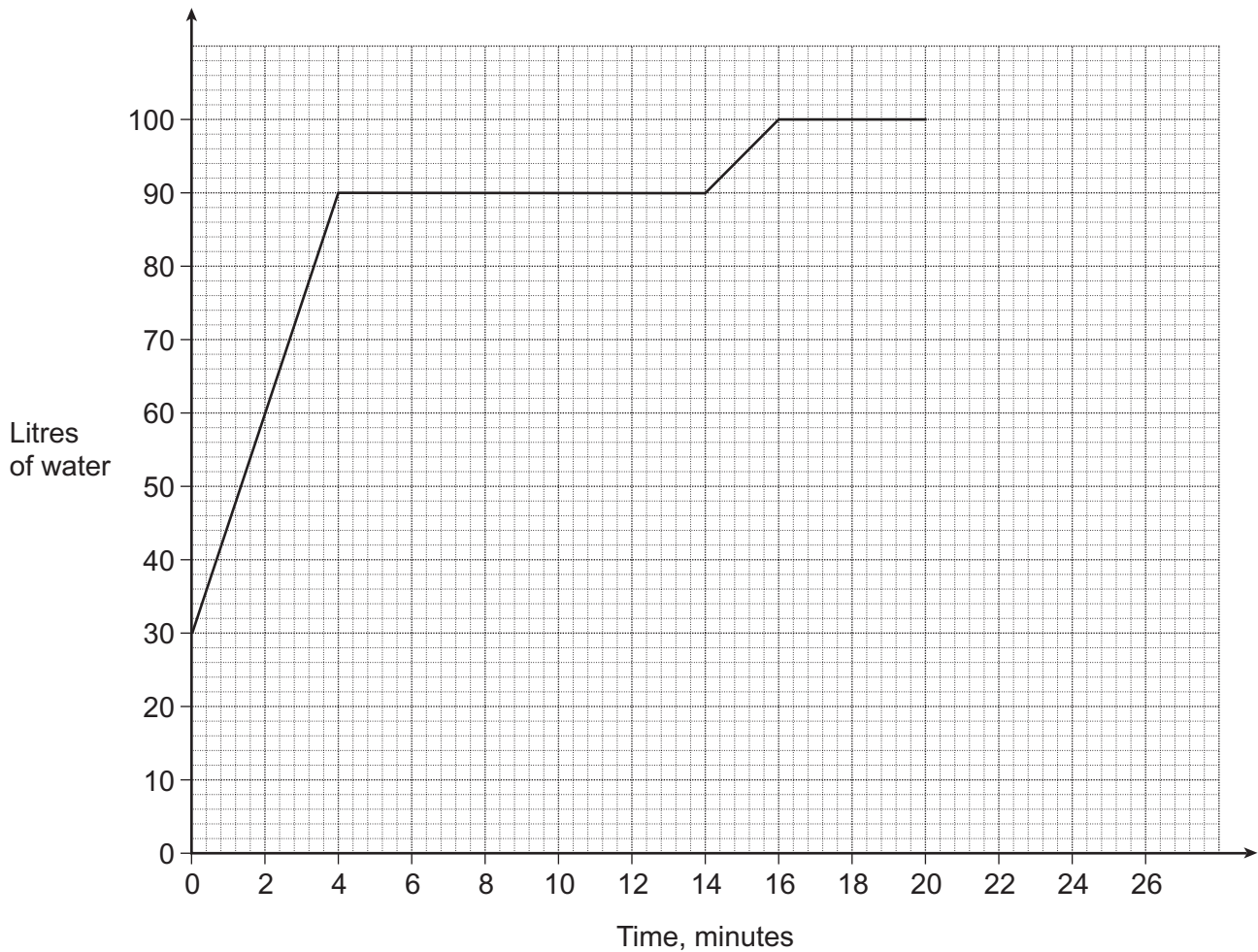
.....  
(1 mark)

Turn over for the next question



12 Louise fills a bath with 30 litres of hot water.

The graph shows how the number of litres of water in the bath changes during the next 20 minutes.



This is what happens during the 20 minutes.

- Louise adds cold water by turning on the cold water tap.
- She gets in the bath immediately after adding the cold water.
- While still in the bath, she adds hot water by turning on the hot water tap.
- After a few more minutes in the bath she gets out.
- As she gets out of the bath she starts to empty the water from the bath.



**12 (a)** How long does it take to add the cold water?

Answer ..... minutes (1 mark)

**12 (b)** How much cold water is added?

.....

Answer ..... litres (1 mark)

**12 (c)** How many minutes is Louise in the bath?

.....

Answer ..... minutes (1 mark)

**12 (d)** Which tap adds water at the faster rate?  
Use the graph to give a reason for your answer.

Answer .....

Reason .....

.....

(1 mark)

**12 (e)** The water empties from the bath at a rate of 20 litres per minute.

How many minutes does it take to empty the bath?

.....

.....

Answer ..... minutes (2 marks)

6

Turn over ►

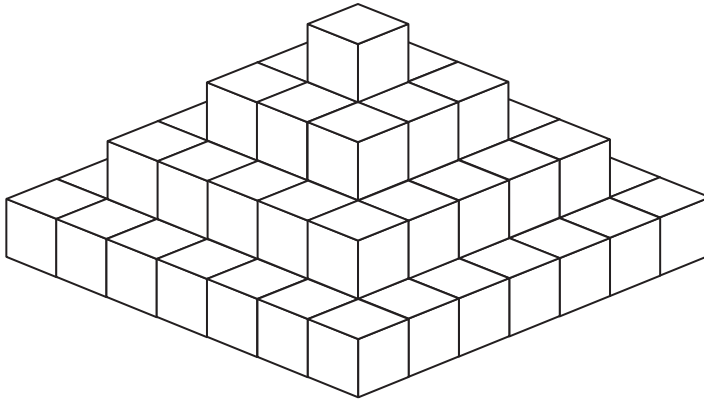


13 (a) The first six square numbers are 1, 4, 9, 16, 25 and 36.

Write down the next **three** square numbers.

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

13 (b) This 3-dimensional shape is made using four layers of centimetre cubes.



Not drawn accurately

The plan view of each layer is a square.

What is the volume of the 3-dimensional shape?

.....

.....

.....

.....

Answer ..... cm<sup>3</sup> (3 marks)





14 (a) Convert 5 kilograms into grams.

.....

Answer ..... grams (1 mark)

14 (b) Complete the last of these three conversions.

3 metres = 300 centimetres

2 square metres = 20 000 square centimetres

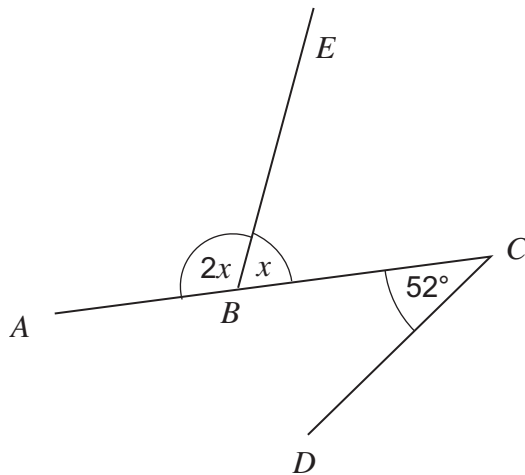
4 cubic metres = ..... cubic centimetres

.....

(1 mark)

15 ABC is a straight line.

Angle ABE is twice the size of angle CBE.



Not drawn accurately

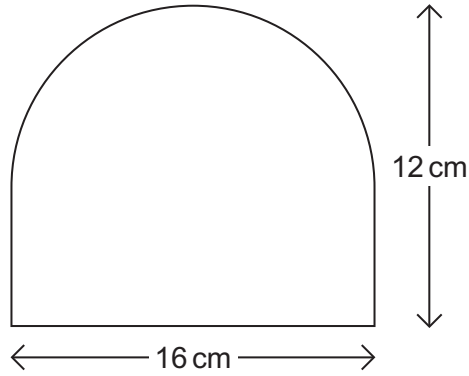
Show that BE is **not** parallel to DC.

.....  
.....  
.....  
.....

(3 marks)



16 This shape is made from a rectangle and a semicircle.



Not drawn  
accurately

Calculate the area of the shape.  
Give your answer to 1 decimal place.

.....

.....

.....

.....

.....

.....

Answer ..... cm<sup>2</sup> (5 marks)

**END OF QUESTIONS**

5



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