

Name

Class



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# Area and perimeter

(9 – 1) Topic booklet

## Foundation

These questions have been collated from previous years GCSE Mathematics papers.

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

### Information

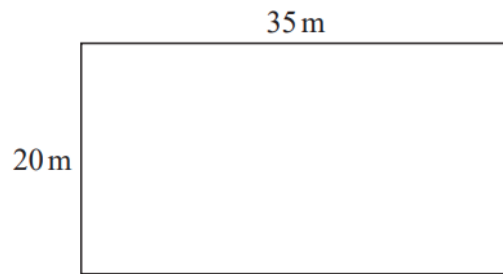
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

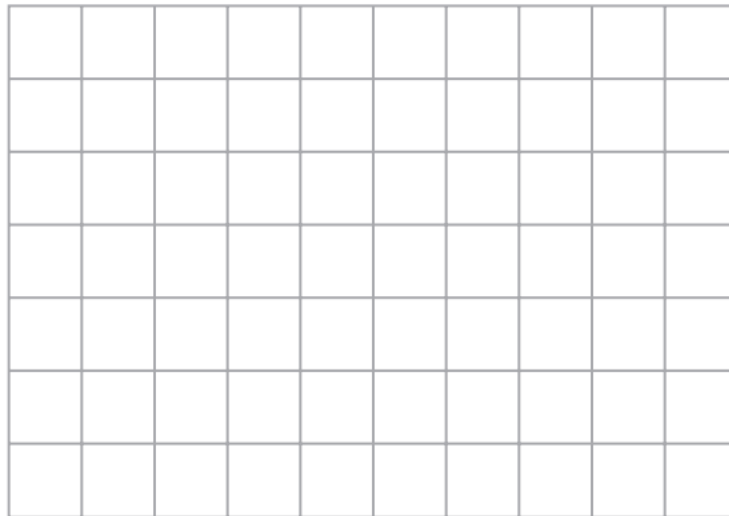
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

**Answer ALL questions**  
**Write your answers in the space provided.**  
**You must write down all the stages in your working.**

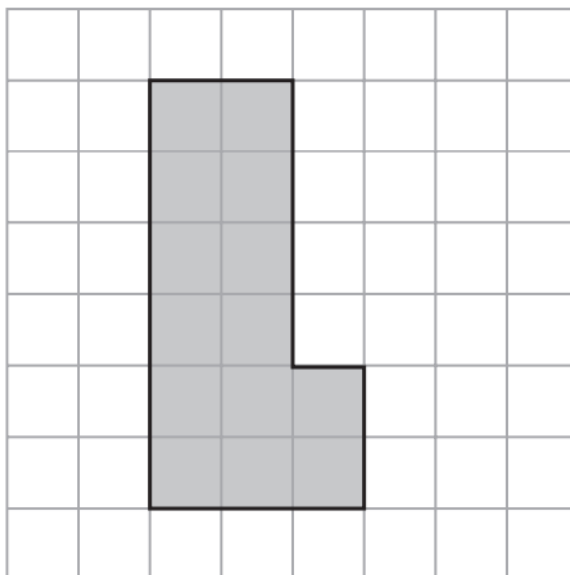
- 5** The diagram shows a rectangle.



On the centimetre grid below, draw an accurate scale drawing of this rectangle.  
Use a scale of 1 cm to represent 5 m.



6 The diagram shows a shape on a centimetre grid.



(a) Find the area of the shape.

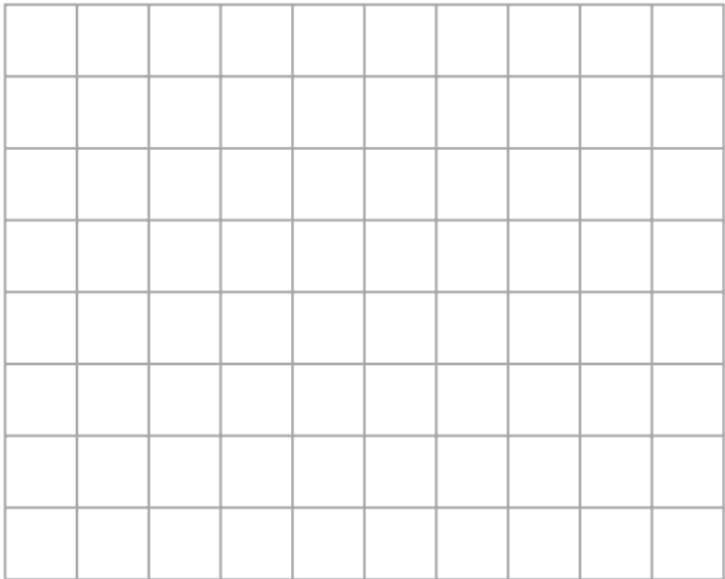
.....  $\text{cm}^2$   
(1)

(b) Find the perimeter of the shape.

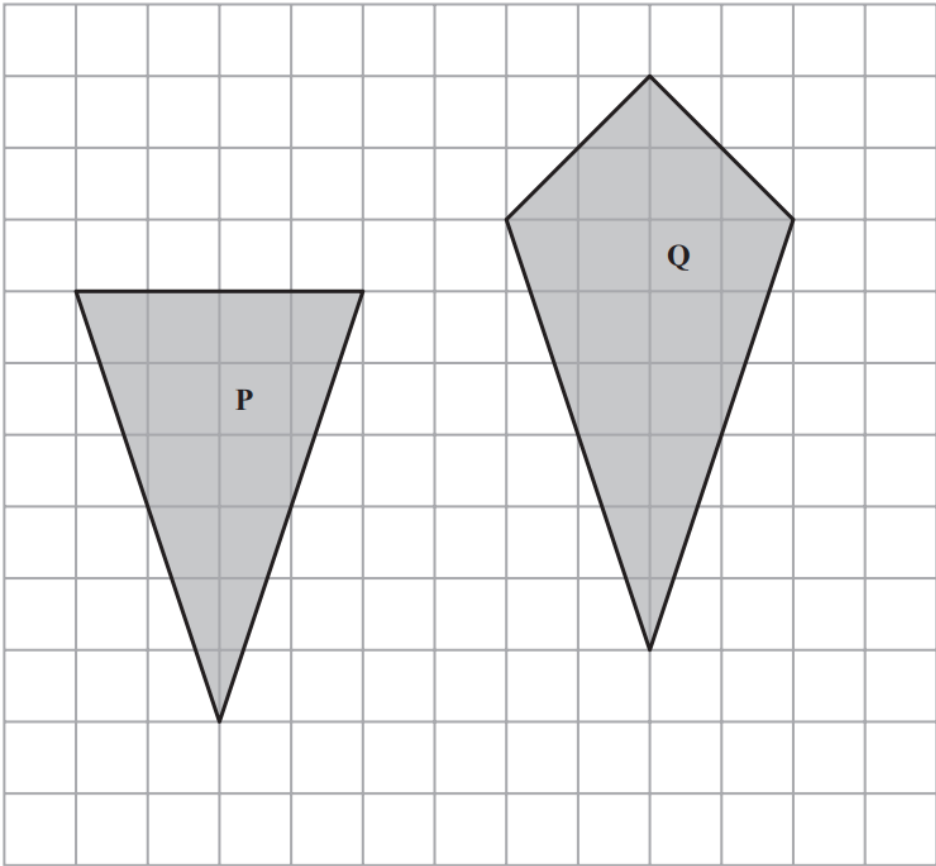
..... cm  
(1)

8 The length of a rectangle is twice as long as the width of the rectangle.  
The area of the rectangle is 32 cm<sup>2</sup>.

Draw the rectangle on the centimetre grid.



10 The diagram shows two shapes drawn on a centimetre grid.



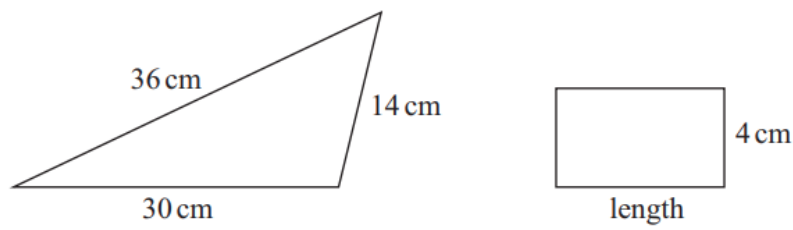
(a) Find the area of shape **P**.

.....  
(2)

(b) Write down the mathematical name of quadrilateral **Q**.

.....  
(1)

12 The diagram shows a triangle and a rectangle.

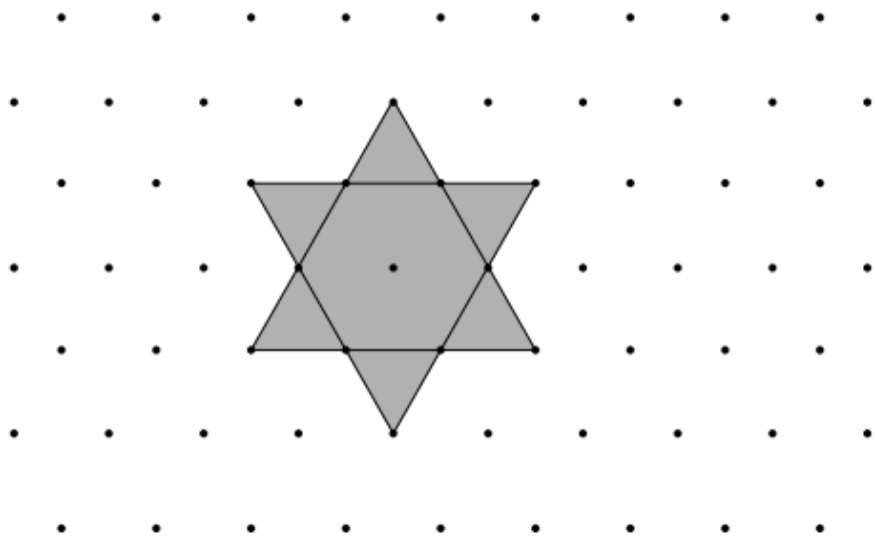


The perimeter of the rectangle is a quarter of the perimeter of the triangle.

Work out the length of the rectangle.

..... cm

12 Here is a star shape.



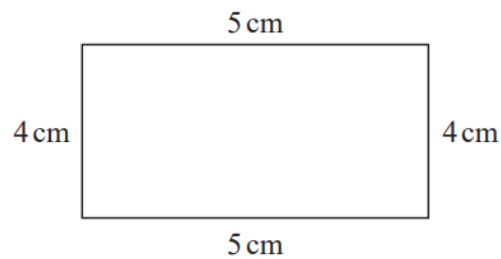
The star shape is made from a regular hexagon and six congruent equilateral triangles.

The area of the star shape is  $96\text{ cm}^2$ .

Work out the area of the regular hexagon.

.....  $\text{cm}^2$

13 Milo is trying to find the area of this rectangle.



He writes,

“The area is  $400\text{ cm}^2$  because  $5 \times 4 \times 5 \times 4 = 400$ ”

(a) Explain what is wrong with Milo’s method.

(1)

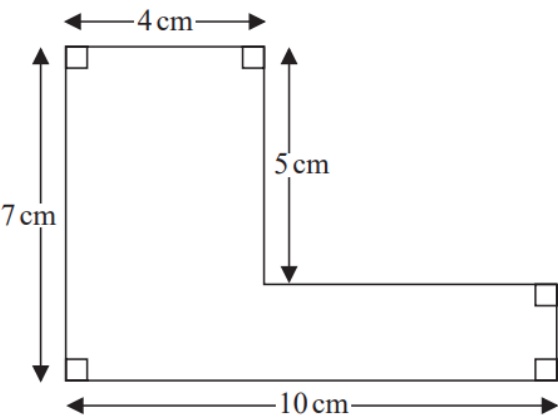
Anya works out the area of a shape.

Her answer is  $86\text{ cm}$ .

(b) Explain why her answer cannot be fully correct.

(1)

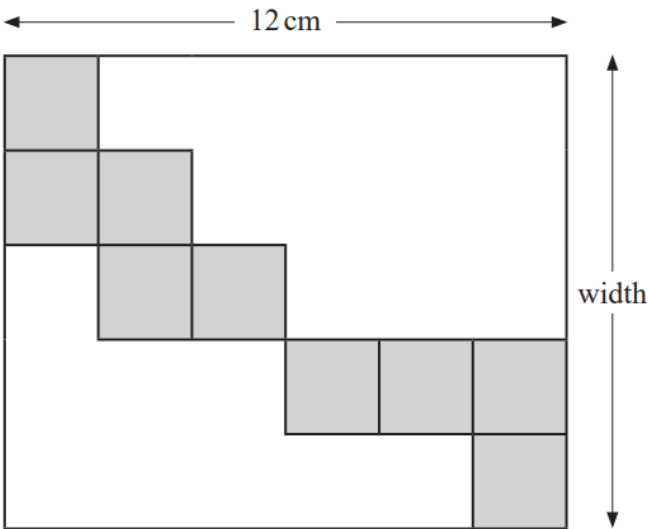




Work out the perimeter of this shape.

..... cm

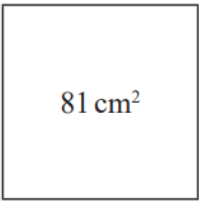
13 The diagram shows nine identical squares inside a rectangle.



The length of the rectangle is 12 cm.  
Work out the width of the rectangle.

.....cm

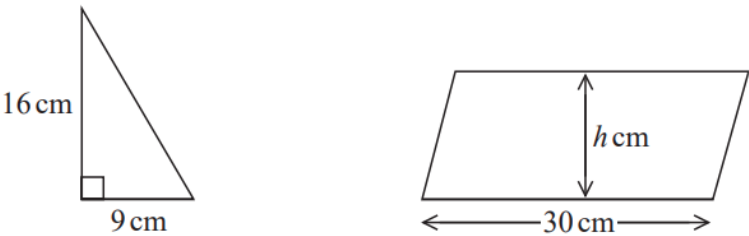
13 A square has an area of  $81\text{ cm}^2$



(a) Find the perimeter of the square.

.....cm  
(2)

The diagram shows a right-angled triangle and a parallelogram.

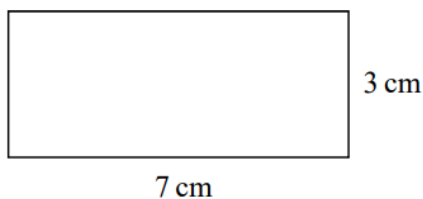


The area of the parallelogram is 5 times the area of the triangle.  
The perpendicular height of the parallelogram is  $h\text{ cm}$ .

(b) Find the value of  $h$ .

$h =$  .....  
(3)

14 Here is a rectangle.



Coby has to find the perimeter of this rectangle.

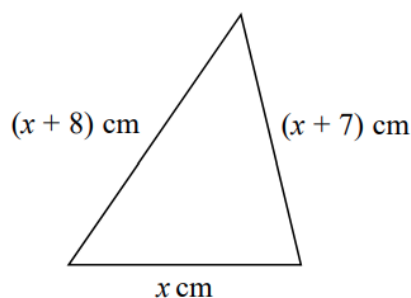
He writes,

$$\text{Perimeter} = 7 \times 3$$

(a) What mistake has Coby made?

(1)

Here is a triangle.



Iram solves a problem about this triangle to find the value of  $x$ .

Her answer is

$$x = -2$$

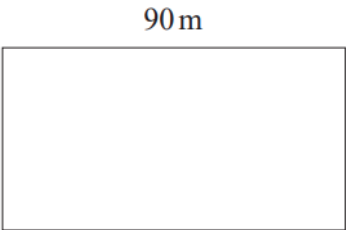
(b) Explain why Iram's answer must be wrong.

(1)

15 A garden is in the shape of a rectangle 90 m by 60 m.

Flowers are grown in 40% of the garden.  
The rest of the garden is grass.

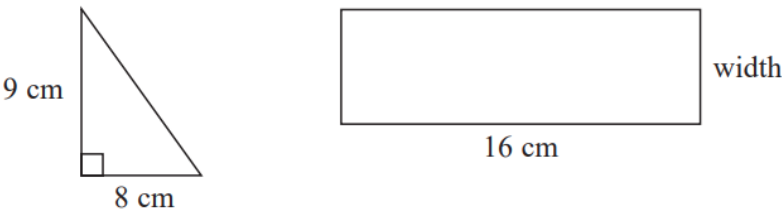
Work out the area of the garden that is grass.



60 m

.....m<sup>2</sup>

**15** Here are a triangle and a rectangle.



The area of the rectangle is 6 times the area of the triangle.

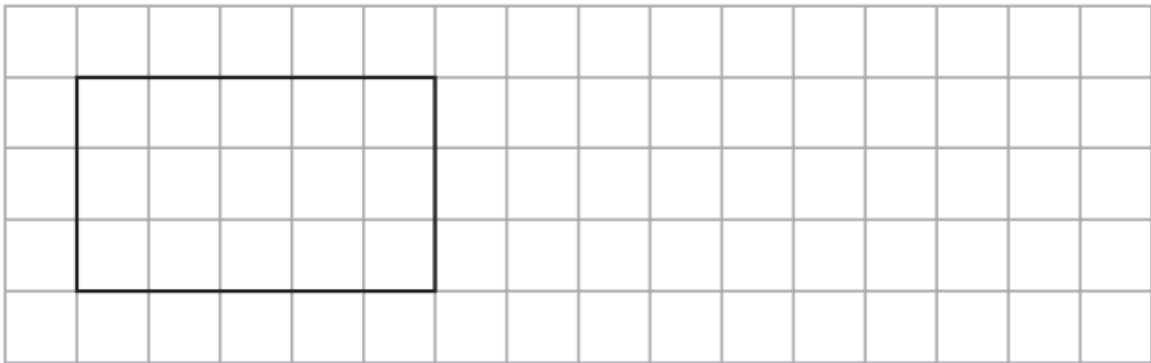
Work out the width of the rectangle.

..... cm

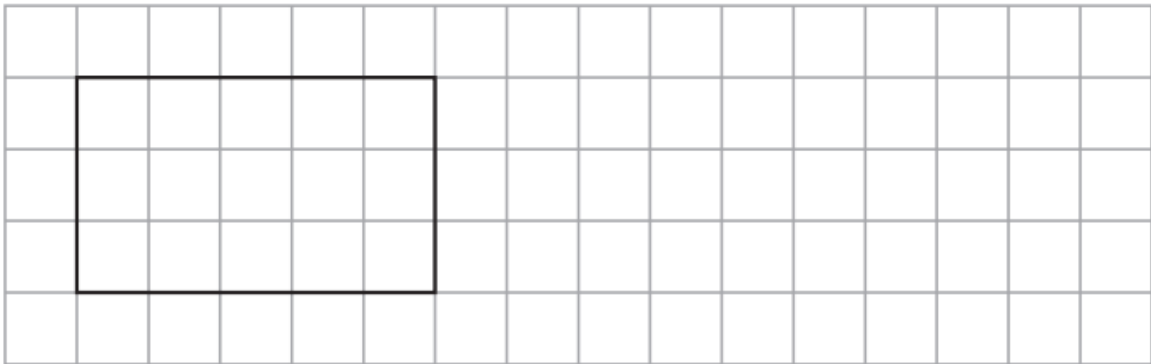
16 Give an example to show that when a piece is cut off a rectangle the perimeter of the new shape



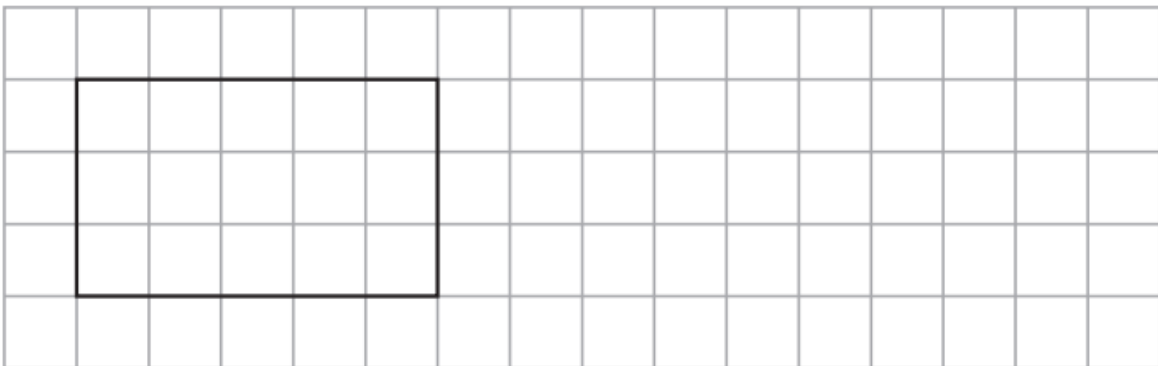
(i) is less than the perimeter of the rectangle,



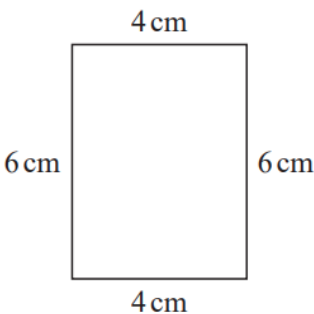
(ii) is the same as the perimeter of the rectangle,



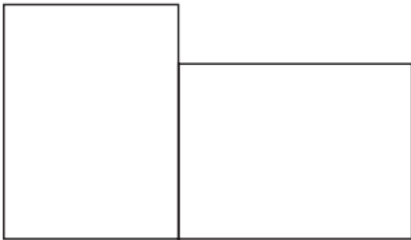
(iii) is greater than the perimeter of the rectangle.



16 Here is a rectangle.



The 6-sided shape below is made from two of these rectangles.

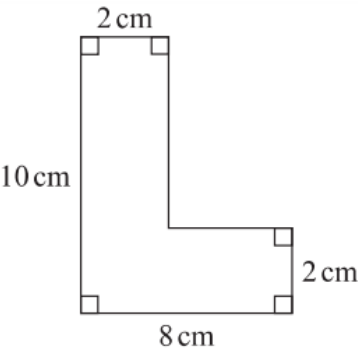


Work out the perimeter of this 6-sided shape.

..... cm



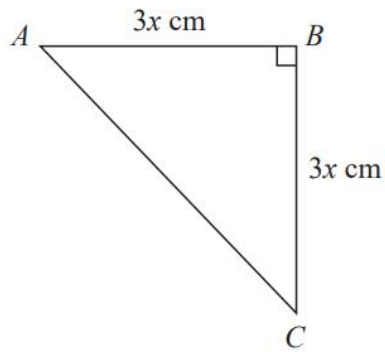
16



Work out the area of the shape.

..... cm<sup>2</sup>

17  $ABC$  is an isosceles right-angled triangle.

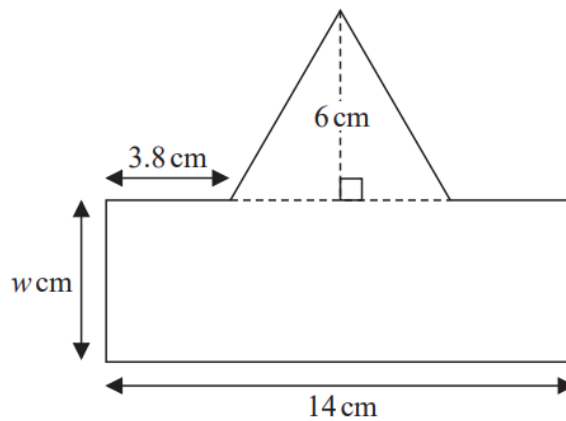


The area of the triangle is  $162 \text{ cm}^2$

Work out the value of  $x$ .

$x = \dots\dots\dots$

18 Here is a shape made from a rectangle and a triangle.



The shape has exactly one line of symmetry.

The area of the rectangle is 3.5 times the area of the triangle.

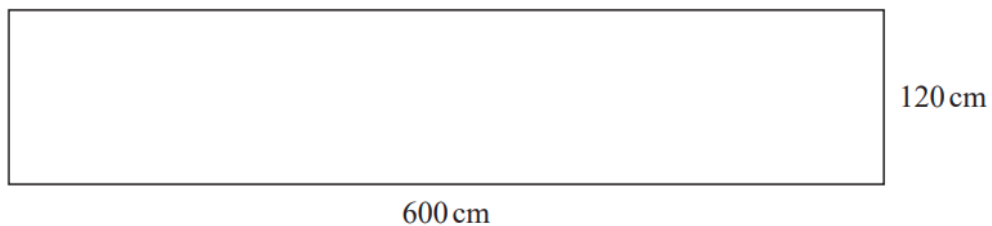
The width of the rectangle is  $w$  cm.

Work out the value of  $w$ .

You must show all your working.

$w =$  .....

**18** The diagram shows a rectangular garden path.



Wasim is going to cover the path with paving stones.

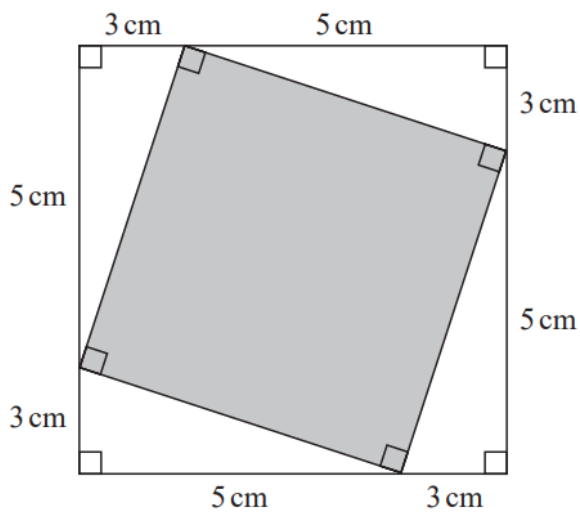
Each paving stone is a square of side 30 cm.

Each paving stone costs £2.50

Wasim has £220 to spend on paving stones.

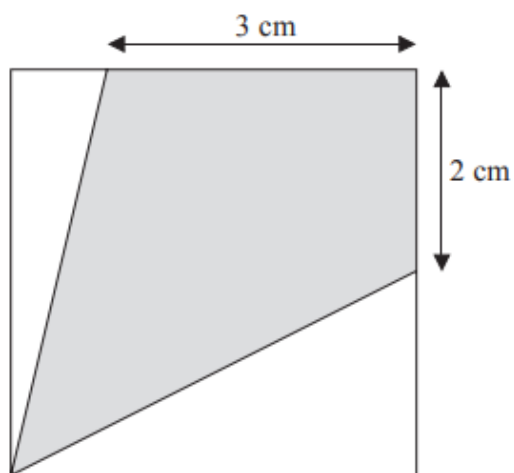
Show that he has enough money to buy all the paving stones he needs.

19 This diagram shows two squares.



Work out the area of the square shown shaded in the diagram.

**20** The diagram shows a square with perimeter 16 cm.



Work out the proportion of the area inside the square that is shaded.

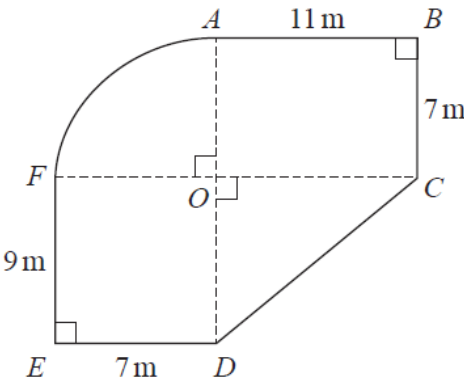
21 The diagram shows a plan of Jason's garden.



$ABCO$  and  $DEFO$  are rectangles.

$CDO$  is a right-angled triangle.

$AFO$  is a sector of a circle with centre  $O$  and angle  $AOF = 90^\circ$



Jason is going to cover his garden with grass seed.

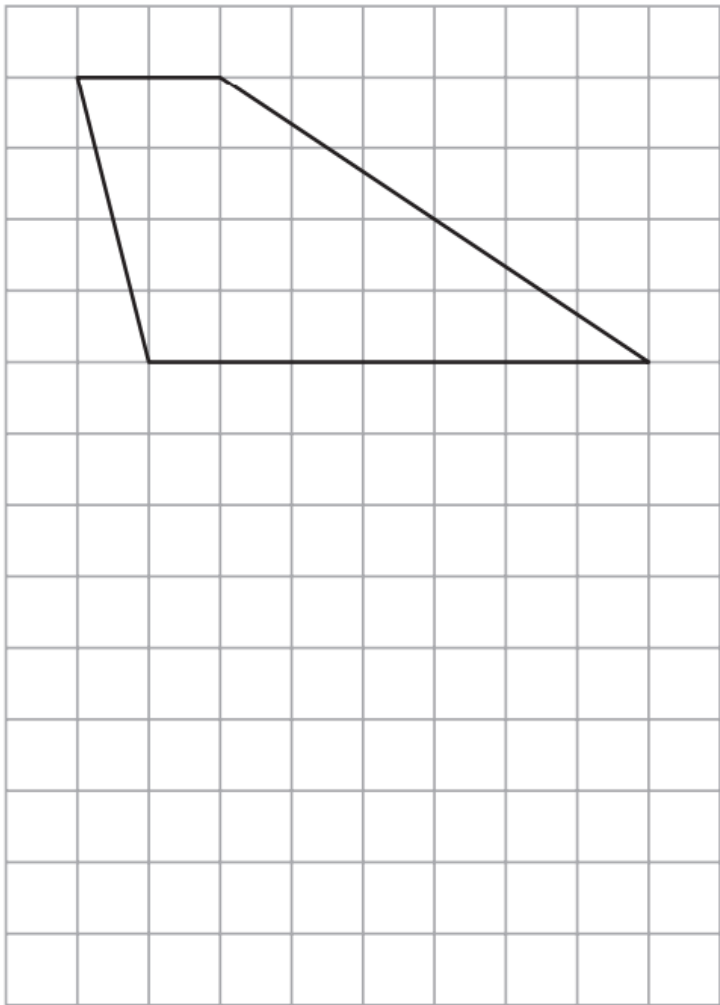
Each bag of grass seed covers  $14\text{m}^2$  of garden.

Each bag of grass seed costs £10.95

Work out how much it will cost Jason to buy all the bags of grass seed he needs.

£.....

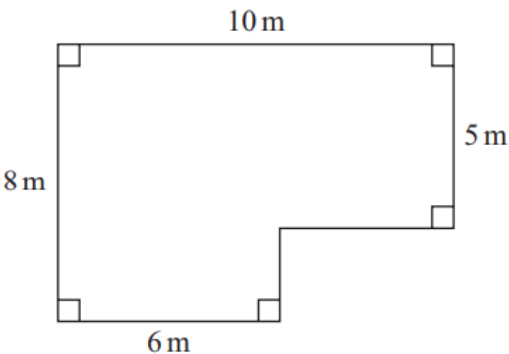
21 Here is a trapezium drawn on a centimetre grid.



On the grid, draw a triangle equal in area to this trapezium.



22 The diagram shows a plan of a floor.



Petra is going to cover the floor with paint.

Petra has 3 tins of paint.  
There are 2.5 litres of paint in each tin.

Petra thinks 1 litre of paint will cover  $10\text{ m}^2$  of floor.

- (a) Assuming Petra is correct, does she have enough paint to cover the floor?  
You must show all your working.

(4)

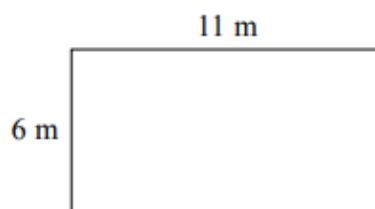
Actually, 1 litre of paint will cover  $11\text{ m}^2$  of floor.

- (b) Does this affect your answer to part (a)?  
You must give a reason for your answer.

(1)

**22** A tin of varnish costs £15

A rectangular floor has dimensions 6 m by 11 m.  
The floor is going to be covered in varnish.



Helen assumes that each tin of this varnish covers an area of  $12 \text{ m}^2$ .

(a) Using Helen's assumption, work out the cost of buying the varnish for this floor.

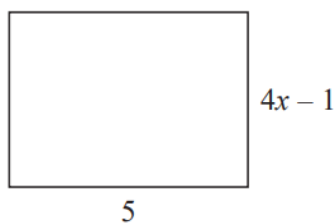
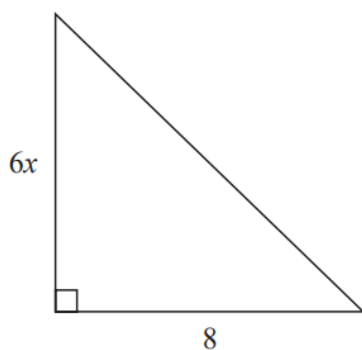
£ .....  
(4)

Helen finds that each tin of varnish covers less than  $12 \text{ m}^2$ .

(b) Explain how this might affect the number of tins she needs to buy.

.....  
.....  
(1)

24 Here is a triangle and a rectangle.



All measurements are in centimetres.

The area of the triangle is  $10\text{ cm}^2$  greater than the area of the rectangle.

Work out the value of  $x$ .

$x = \dots\dots\dots$

26 Maisie knows that she needs 3 kg of grass seed to make a rectangular lawn 5 m by 9 m.



Grass seed is sold in 2 kg boxes.

Maisie wants to make a rectangular lawn 10 m by 14 m.

She has 5 boxes of grass seed.

- (a) Has Maisie got enough grass seed to make a lawn 10 m by 14 m?  
You must show all your working.

(4)

Maisie opens the 5 boxes of grass seed.

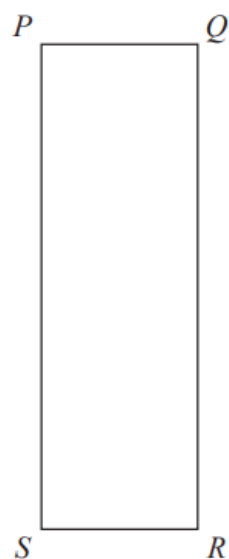
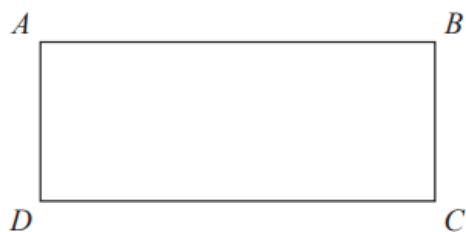
She finds that 4 of the boxes contain 2 kg of grass seed.

The other box contains 1 kg of grass seed.

- (b) Does this affect whether Maisie has enough grass seed to make her lawn?  
Give a reason for your answer.

(1)

28 Here are two rectangles.



$$QR = 10 \text{ cm}$$

$$BC = PQ$$

The perimeter of  $ABCD$  is 26 cm

The area of  $PQRS$  is  $45 \text{ cm}^2$

Find the length of  $AB$ .

..... cm