Chhetri Academy

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GCSE MATHS

Geometry and measures

Edexcel 1MA1 | Subtopic collection Topic 43

Area and perimeter

Foundation tier

Past paper question booklet

114	2011-2025	Foundation
question groups	available papers	tier

Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

12 Fran is decorating her bedroom.
She is going to put a border all around the bedroom.

This diagram shows a plan of the bedroom.

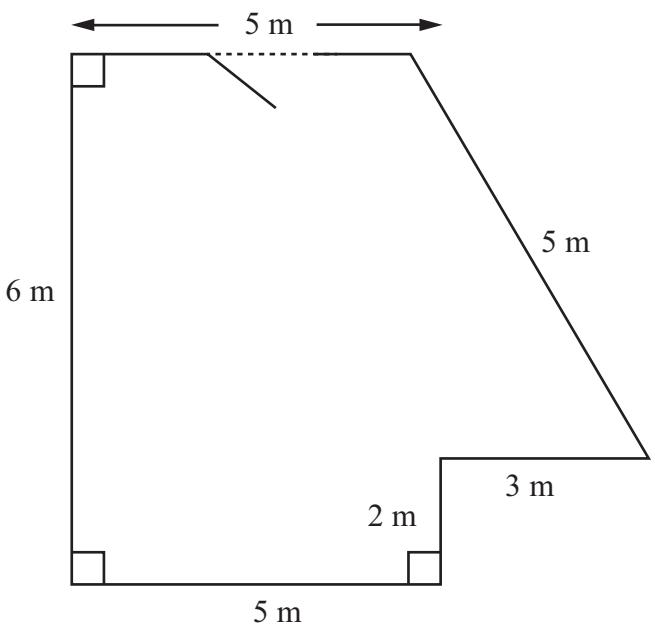


Diagram **NOT** accurately drawn

Border rolls are sold in 4 m lengths.
Work out the number of border rolls Fran will need to buy.

.....

(Total for Question 12 is 4 marks)

***15** The diagram shows the plan of the floor of Mrs Phillips' living room.

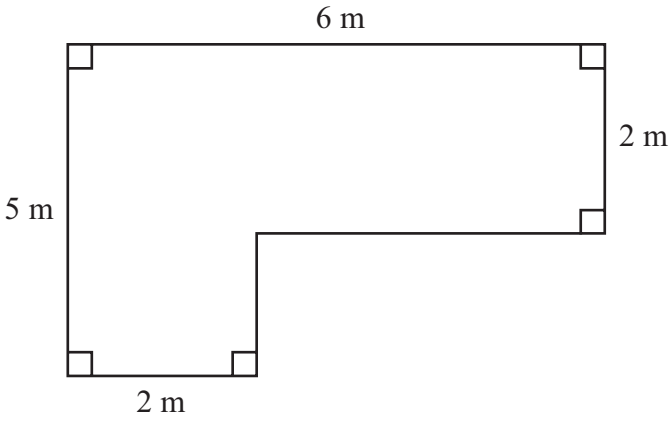


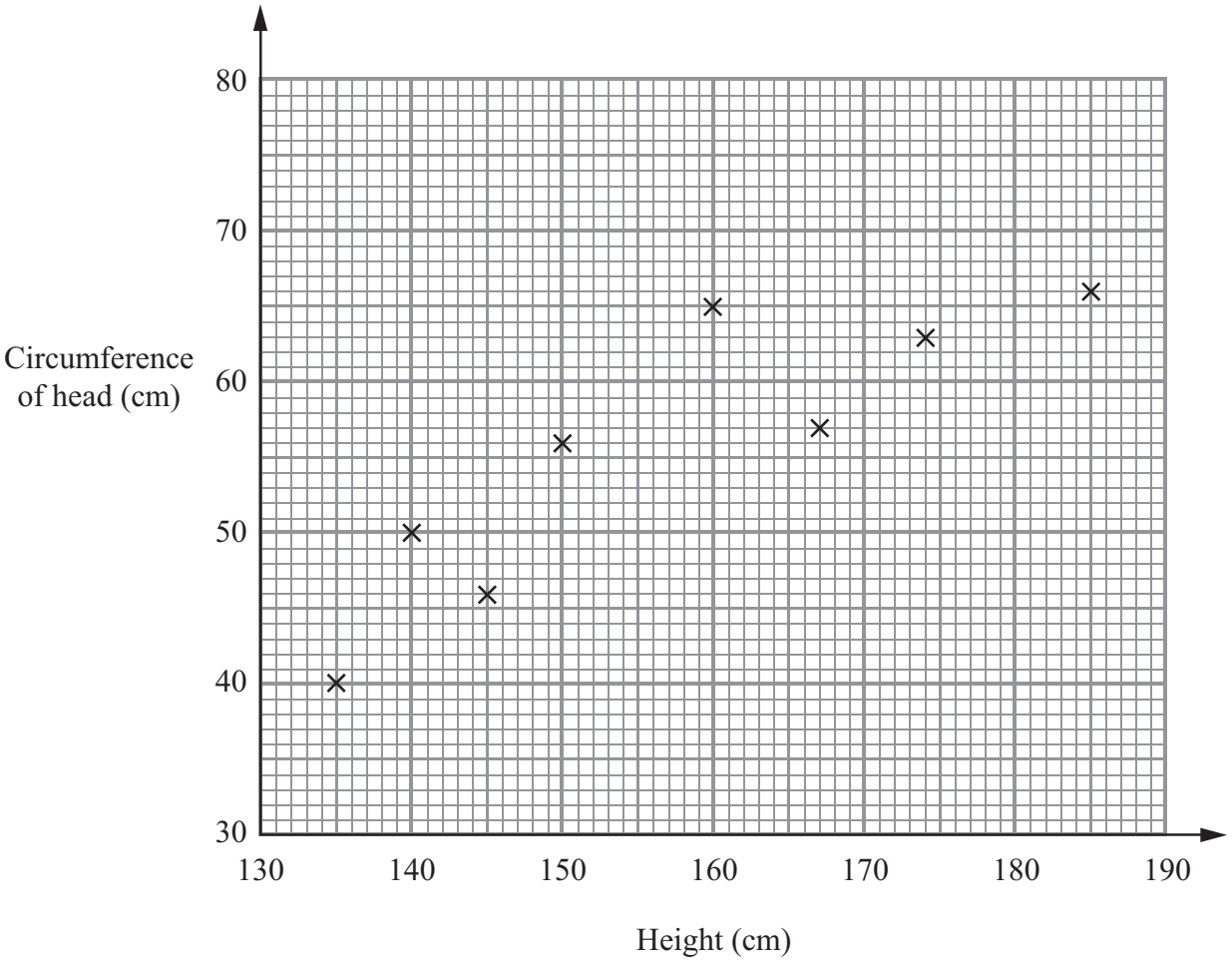
Diagram **NOT** accurately drawn

Mrs Phillips is going to cover the floor with floor boards.
One pack of floor boards will cover 2.5 m^2.

How many packs of floor boards does she need?
You must show your working.

(Total for Question 15 is 4 marks)

14 The scatter graph shows information about 8 people.
It shows each person's height and the circumference of their head.



The table gives this information for 2 other people.

Height (cm)	180	170
Circumference of head (cm)	72	65

(a) On the scatter graph, plot the information from the table.

(1)

(b) Describe the correlation.

.....

(1)

(c) Draw a line of best fit on your scatter graph.

(1)

(d) Estimate the circumference of the head of a person who is 156 cm tall.

..... cm

(1)

(Total for Question 14 is 4 marks)

15 The diagram shows **shape A.**
All the measurements are in centimetres.

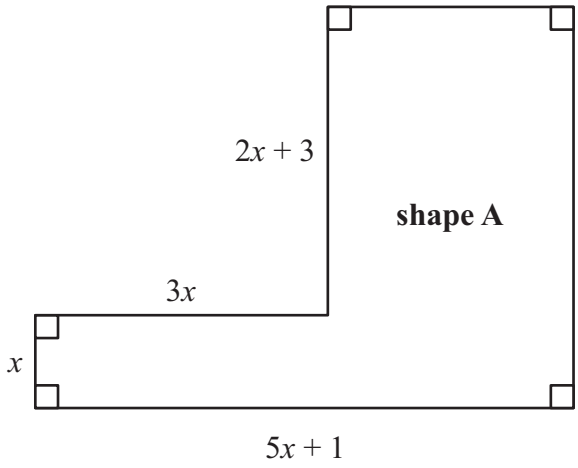


Diagram **NOT** accurately drawn

(a) Find an expression, in terms of x, for the perimeter of **shape A**.

.....

(3)

A square has the same perimeter as **shape A**.

(b) Find an expression, in terms of x, for the length of one side of this square.

.....

(1)

(Total for Question 15 is 4 marks)

16 Jake makes a picture frame from 4 identical pieces of card.
Each piece of card is in the shape of a trapezium.

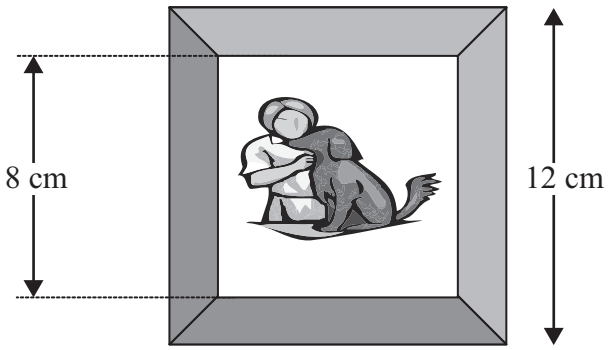


Diagram **NOT** accurately drawn

The outer edge of the frame is a square of side 12 cm.
The inner edge of the frame is a square of side 8 cm.

Work out the area of each piece of card.

..... cm^2

(Total for Question 16 is 4 marks)

*17

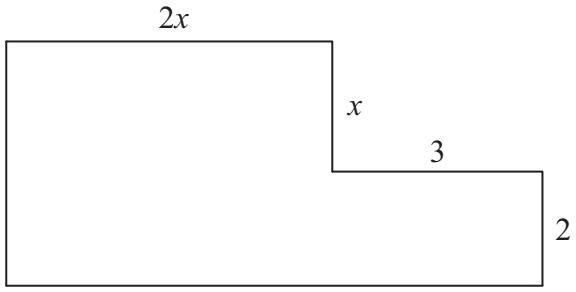


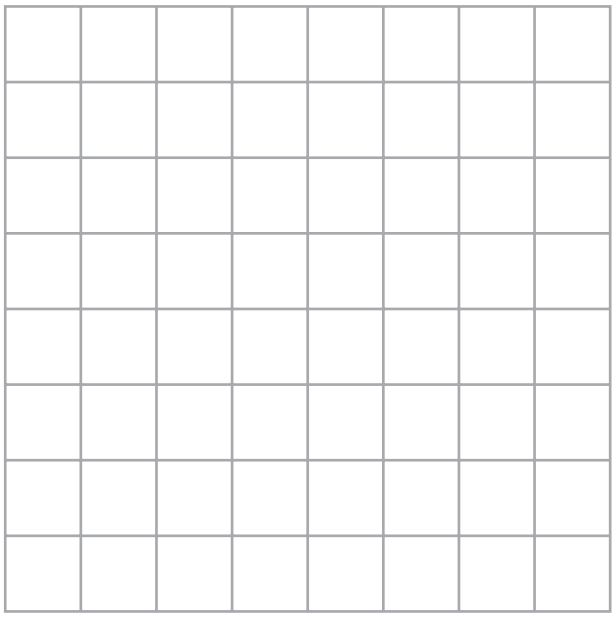
Diagram **NOT** accurately drawn

In the diagram, all measurements are given in centimetres.
All angles are right angles.

Show that the perimeter of the shape can be written as $2(3x + 5)$.

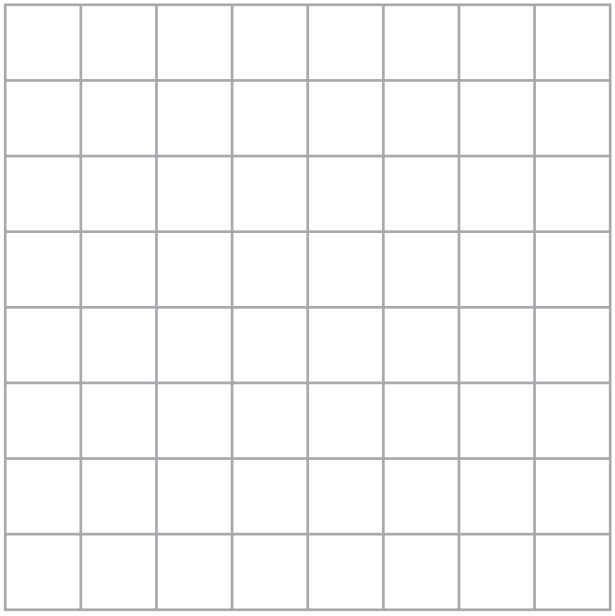
(Total for Question 17 is 4 marks)

9 (a) On the grid, draw an isosceles triangle.



(1)

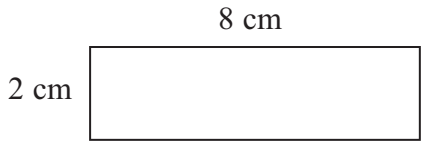
(b) On the grid, draw a rectangle with an area of 12 cm^2.



(2)

(Total for Question 9 is 3 marks)

14 The diagram shows a rectangle and a square.



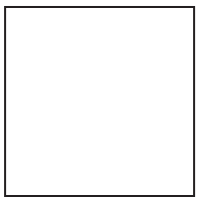


Diagram **NOT** accurately drawn

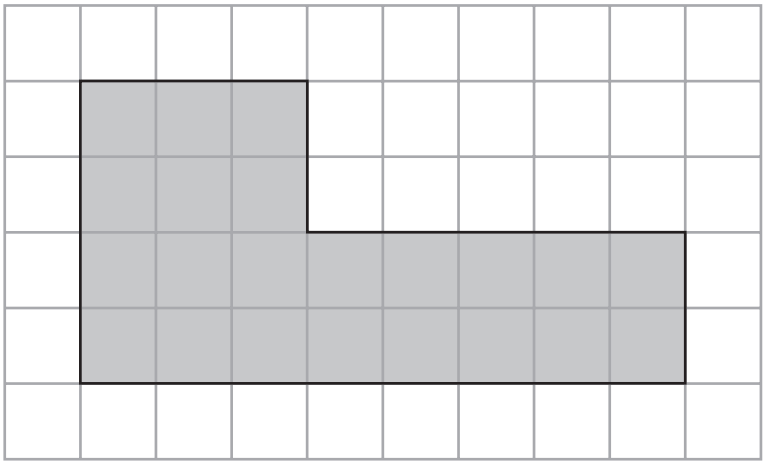
The perimeter of the rectangle is the same as the perimeter of the square.

Work out the length of one side of the square.

..... cm

(Total for Question 14 is 4 marks)

8 The shaded shape is drawn on a grid of centimetre squares.



(a) Find the perimeter of the shaded shape.

..... cm

(1)

(b) Find the area of the shaded shape.

..... cm^2

(1)

(Total for Question 8 is 2 marks)

***27** Mr Weaver's garden is in the shape of a rectangle.

In the garden

there is a patio in the shape of a rectangle
and two ponds in the shape of circles with diameter 3.8 m.

The rest of the garden is grass.

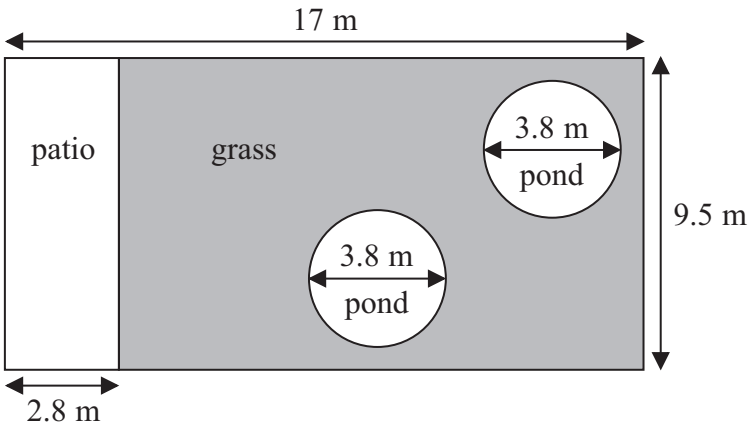


Diagram **NOT** accurately drawn

Mr Weaver is going to spread fertiliser over all the grass.
One box of fertiliser will cover 25 m^2 of grass.

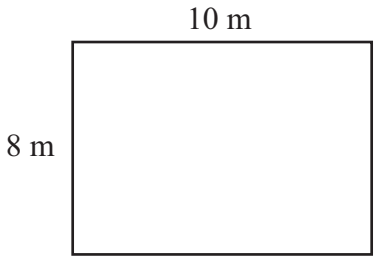
How many boxes of fertiliser does Mr Weaver need?
You must show your working.

(Total for Question 27 is 5 marks)

10 Dilys buys a new house.

She wants to have a lawn in the back garden.
The lawn is going to be in the shape of a rectangle.

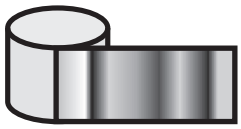
Diagram **NOT** accurately drawn



The lawn will have a length of 10 m.
The lawn will have a width of 8 m.

Edging strip

£1.50 per metre



Dilys wants to buy edging strip for her lawn.
The length of the edging strip needs to be equal to the perimeter of her lawn.

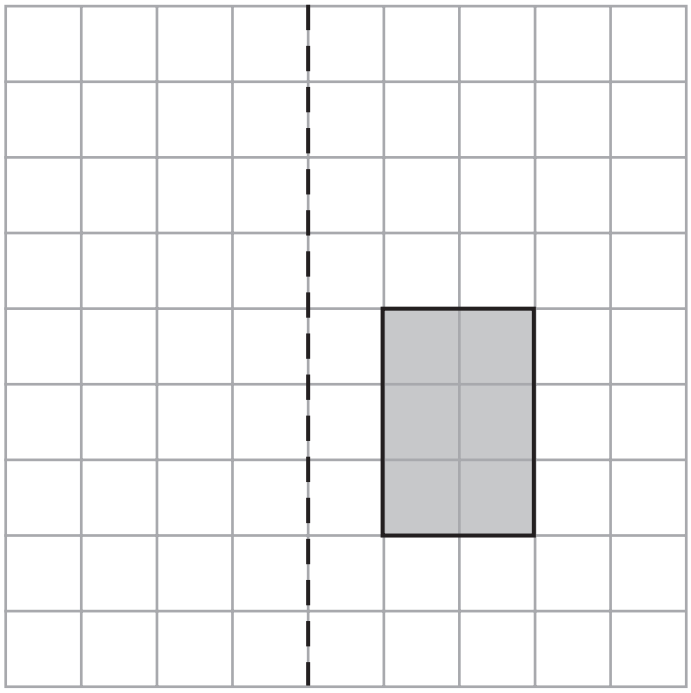
Edging strip costs £1.50 per metre.

What is the total cost of the edging strip?

£ .....

(Total for Question 10 is 4 marks)

8 Here is a shaded shape on a grid of centimetre squares.



(a) Find the perimeter of the shaded shape.

..... cm

(1)

(b) Find the area of the shaded shape.

..... cm^2

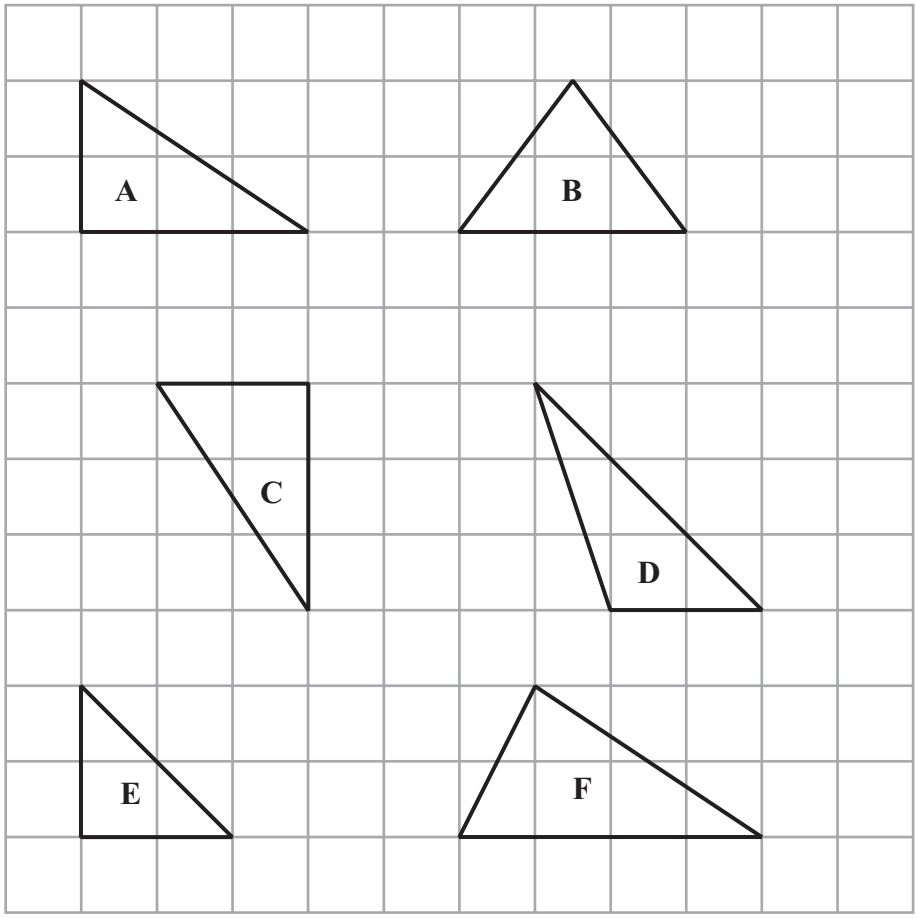
(1)

(c) Reflect the shaded shape in the mirror line.

(2)

(Total for Question 8 is 4 marks)

13 Here are 6 triangles drawn on a grid of centimetre squares.



(a) Write down the letters of the **two** congruent triangles.

.....

(1)

(b) Write down the letter of an isosceles triangle.

.....

(1)

(c) Find the area of triangle **E**.

..... cm^2

(1)

(Total for Question 13 is 3 marks)

14 Here is a right-angled triangle.

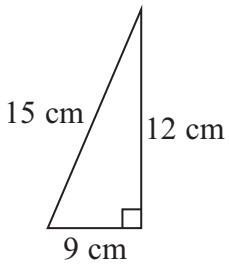


Diagram **NOT** accurately drawn

The shape below is made from 4 of these triangles.

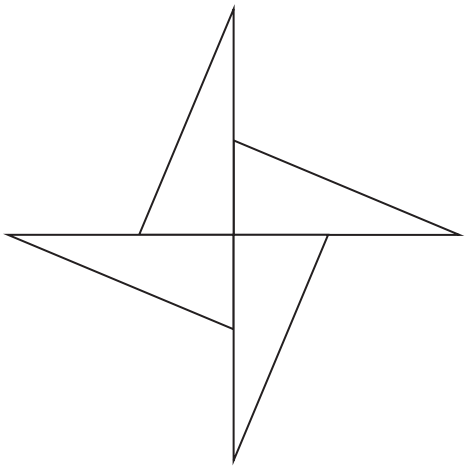


Diagram **NOT** accurately drawn

(a) Work out the area of the shape.

..... cm^2

(3)

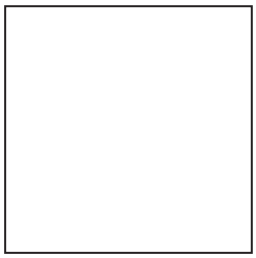
(b) Work out the perimeter of the shape.

..... cm

(3)

(Total for Question 14 is 6 marks)

6 Here is a square.



(a) On the square, draw all the lines of symmetry.

(2)

Here is a rectangle.



(b) Write down the order of rotational symmetry of the rectangle.

.....

(1)

Here is a different rectangle.

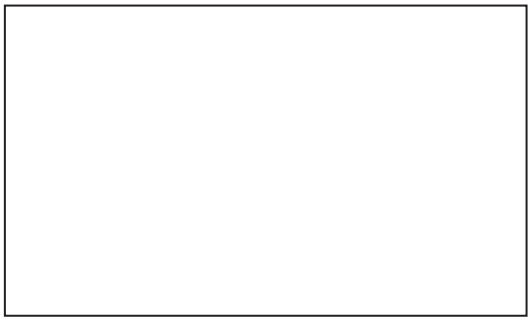


Diagram **NOT** accurately drawn

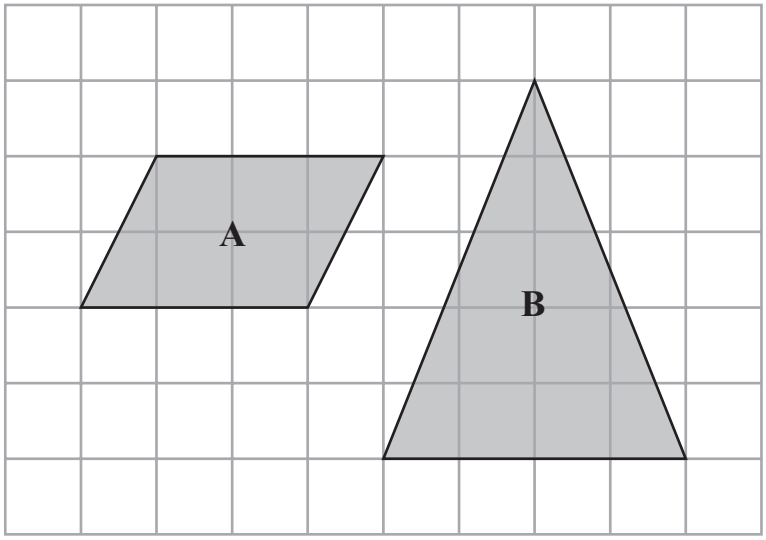
(c) Work out the area of this rectangle.

..... cm^2

(2)

(Total for Question 6 is 5 marks)

10 Here are a quadrilateral and a triangle drawn on a centimetre grid.



(a) Write down the special name for quadrilateral **A**.

.....

(1)

(b) Write down the special name for triangle **B**.

.....

(1)

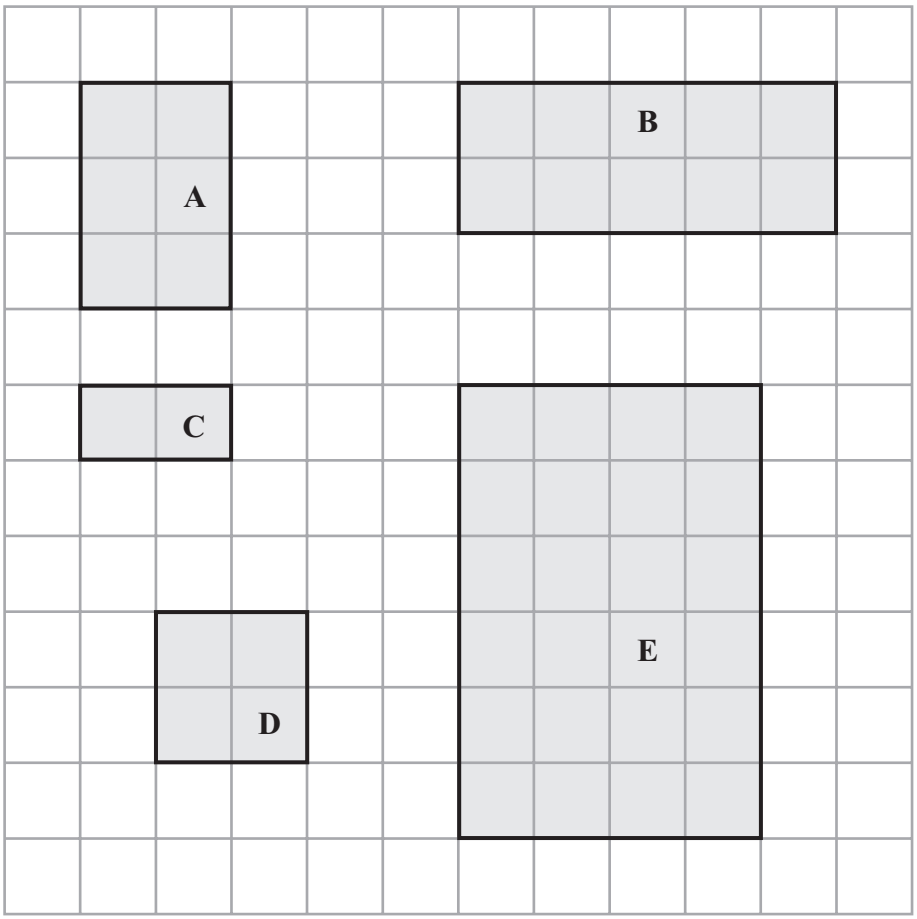
(c) Find the area of quadrilateral **A**.

..... cm^2

(2)

(Total for Question 10 is 4 marks)

10 Here are some shaded shapes drawn on a centimetre grid.



(a) Write down the letters of the two similar shapes.

..... and .....

(1)

(b) Find the perimeter of shape **C**.

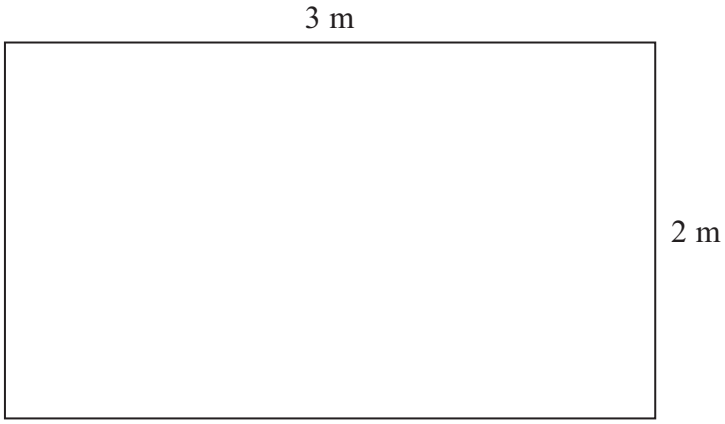
.....

(2)

(Total for Question 10 is 3 marks)

17 Here is a diagram of part of a wall in Sarah's house.

Diagram **NOT** accurately drawn



Sarah is going to cover this part of the wall with square tiles.
The square tiles have sides of 20 cm.

Work out the number of tiles Sarah needs.

..... tiles

(Total for Question 17 is 3 marks)

13 Jade wants to paint a wall.

The paint is sold in three sizes of tin.

The table gives information about the tins of paint.

Size of tin	Cost
1 litre	£6
3 litres	£15
5 litres	£23.50

1 litre of this paint covers an area of 8 m^2.
The wall has an area of 112 m^2.

Work out the cheapest cost of the paint Jade needs.

£ .....

(Total for Question 13 is 4 marks)

17 Here is a triangle.

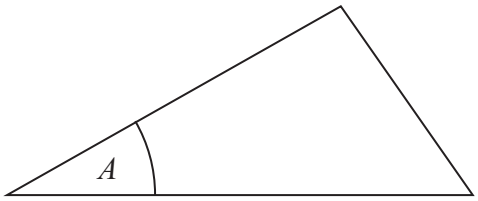


Diagram **NOT** accurately drawn

The perimeter of the triangle is 10 cm.
Angle $A = 40°$.

The triangle is enlarged by a scale factor of 3

(i) Write down the perimeter of the enlarged triangle.

..... cm

(ii) Write down the size of angle A in the enlarged triangle.

°
.....

(Total for Question 17 is 2 marks)

23 The diagram shows a semicircle drawn inside a rectangle.

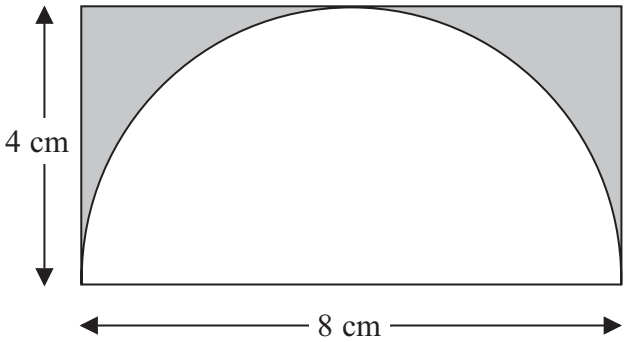


Diagram **NOT** accurately drawn

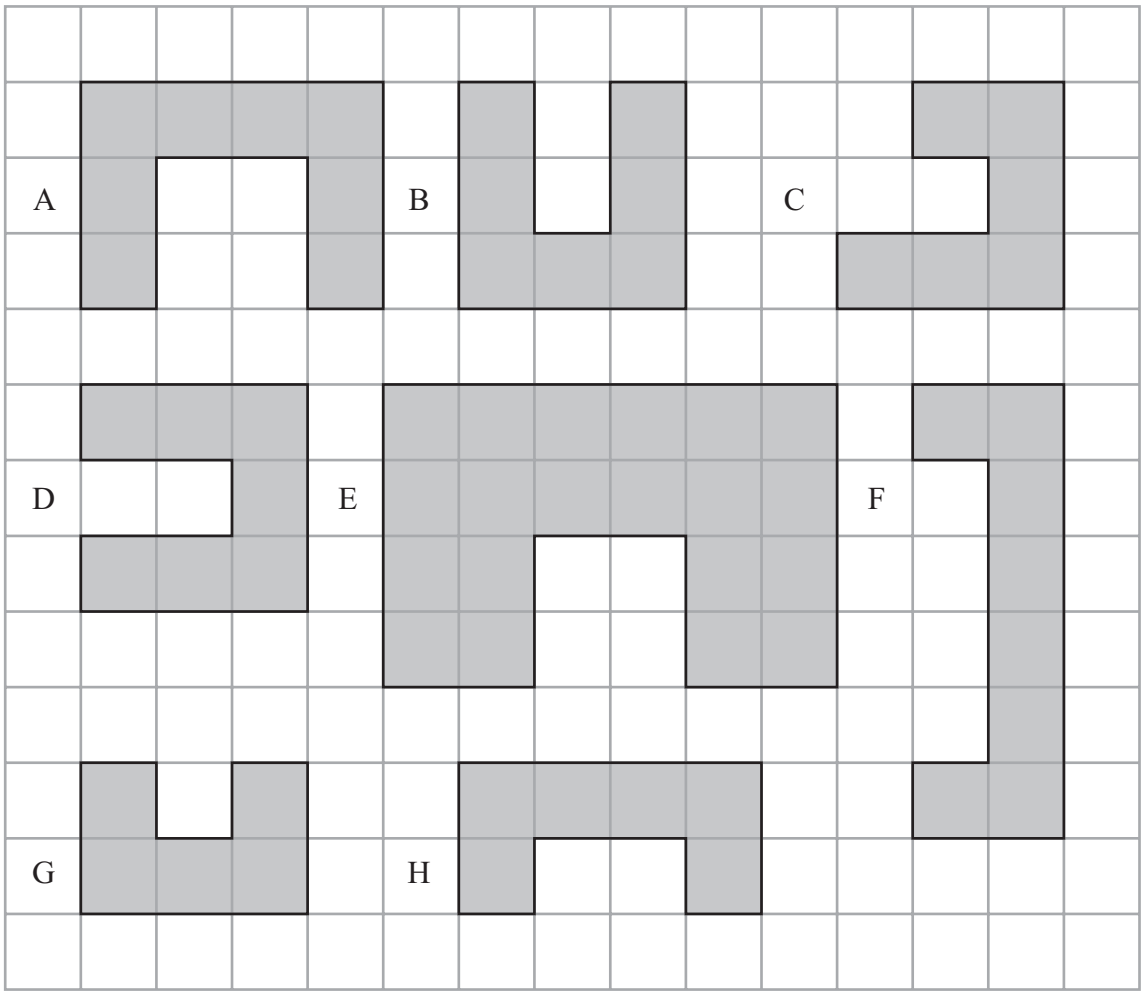
The semicircle has a diameter of 8 cm.
The rectangle is 8 cm by 4 cm.

Work out the area of the shaded region.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 23 is 4 marks)

12 These shapes have been drawn on a grid of centimetre squares.



(a) (i) Write down the letters of a pair of shapes that are congruent.

..... and .....

(ii) Write down the letters of a different pair of shapes that are similar.

..... and .....

(2)

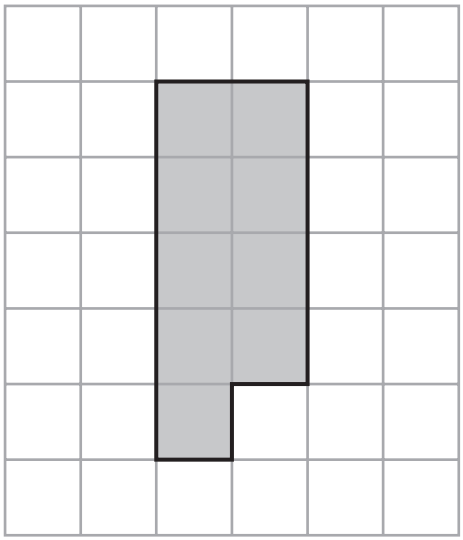
(b) Find the perimeter of shape D.

..... cm

(1)

(Total for Question 12 is 3 marks)

8 The shaded shape is drawn on a grid of centimetre squares.

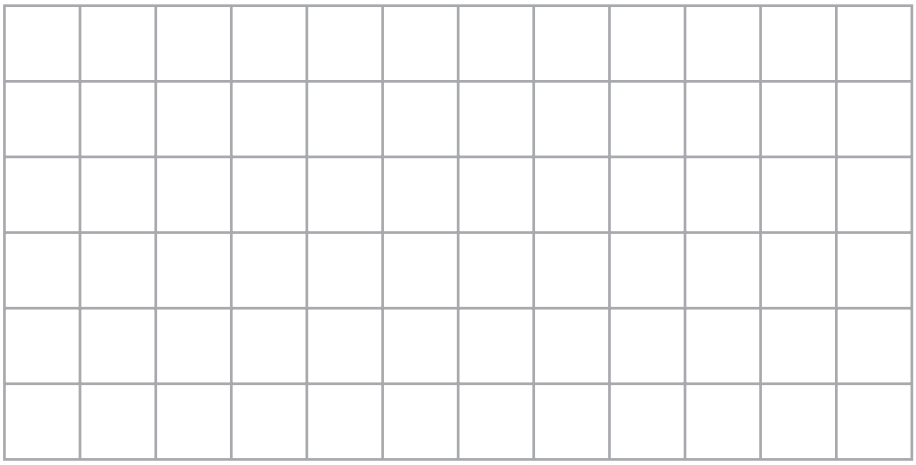


(a) Find the perimeter of the shaded shape.

.....

(2)

(b) On the grid below, draw a square with the same **area** as the shaded shape.



(1)

(Total for Question 8 is 3 marks)

28 The diagram shows a garden in the shape of a rectangle.

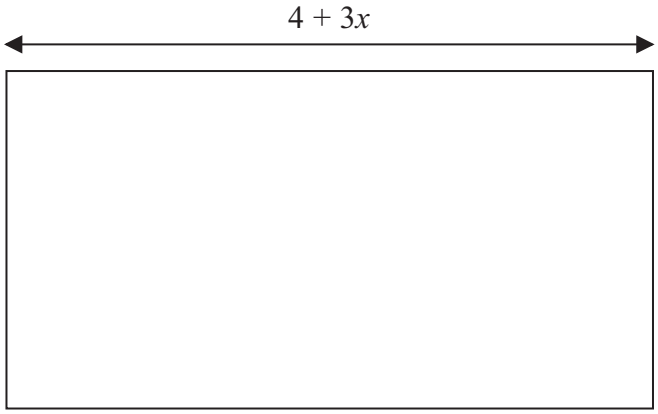


Diagram **NOT** accurately drawn

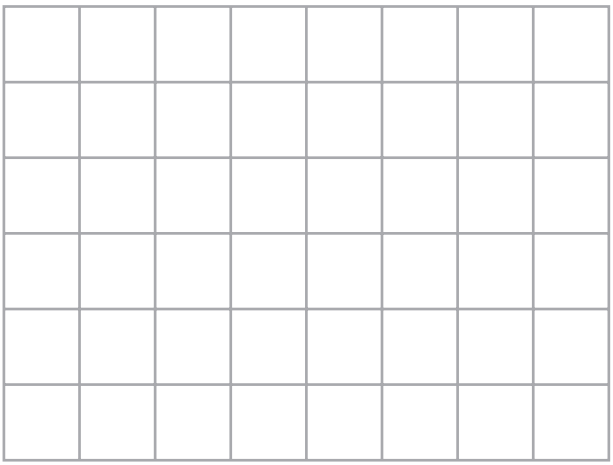
All measurements are in metres.
The perimeter of the garden is 32 metres.

Work out the value of x

.....

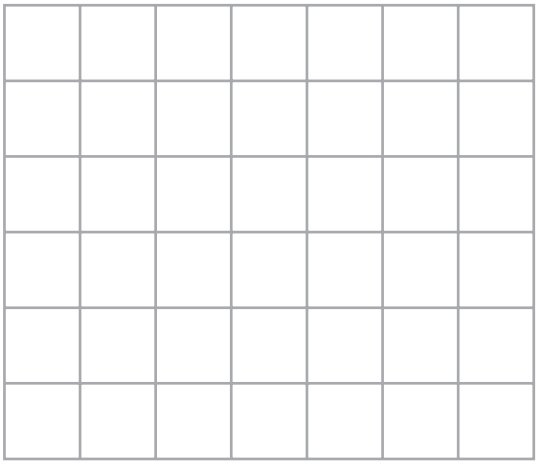
(Total for Question 28 is 4 marks)

7 (a) On the grid of centimetre squares, draw an isosceles triangle.



(1)

(b) On the grid of centimetre squares, draw a rectangle with a perimeter of 10 cm.



(2)

(Total for Question 7 is 3 marks)

***19** The diagram shows the floor plan of Jill's dining room.

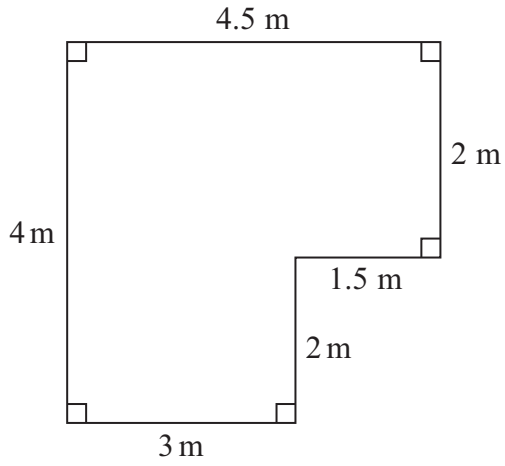


Diagram **NOT** accurately drawn

Jill is going to cover the floor with wooden floorboards.

The floorboards are sold in packs.
One pack of floorboards will cover 2.25 m^2.

Work out how many packs Jill needs.
You must show all your working.

(Total for Question 19 is 4 marks)

22 Here is a rule for working out the area of a triangle.

> Multiply the base by the height.
>
> Then divide by 2

A triangle has a base of 12 cm and a height of 6 cm.

(a) Use the rule to work out the area of the triangle.

..... cm^2

(2)

A different triangle has an area of 55 cm^2.
It has a height of 11 cm.

(b) Work out the base of this triangle.

..... cm

(2)

(Total for Question 22 is 4 marks)

28 ABC is a triangle.

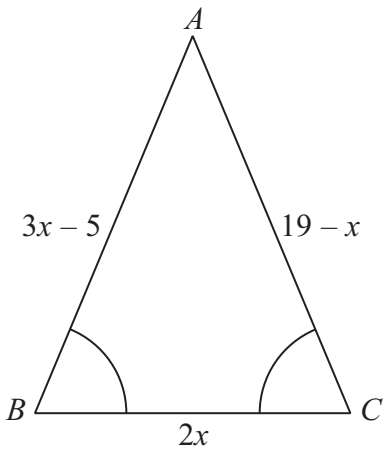


Diagram **NOT** accurately drawn

Angle ABC = angle BCA.

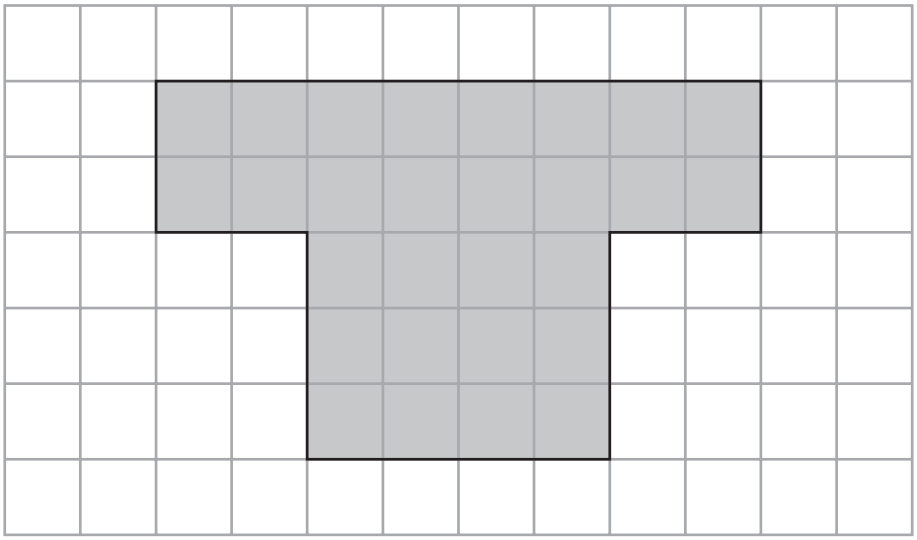
The length of side AB is $(3x - 5)$ cm.
The length of side AC is $(19 - x)$ cm.
The length of side BC is $2x$ cm.

Work out the perimeter of the triangle.
Give your answer as a number of centimetres.

..... cm

(Total for Question 28 is 5 marks)

12 Here is a shaded shape drawn on a centimetre grid.



(a) How many lines of symmetry does the shaded shape have?

.....

(1)

(b) Find the perimeter of the shaded shape.

..... cm

(1)

Here is a rectangle.

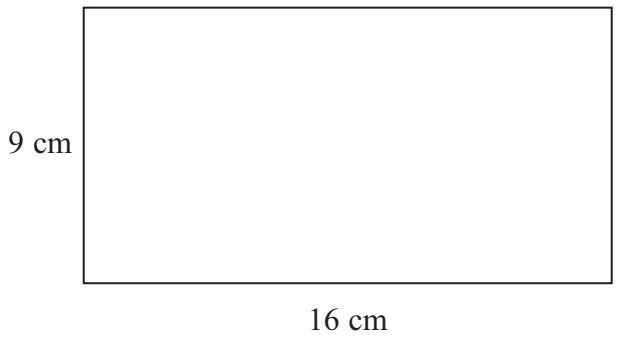


Diagram **NOT** accurately drawn

(c) Work out the area of this rectangle.

..... cm^2

(2)

(Total for Question 12 is 4 marks)

27 A circle has a diameter of 140 cm.

Work out the circumference of the circle.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 27 is 2 marks)

17 Here is a diagram of a small field.

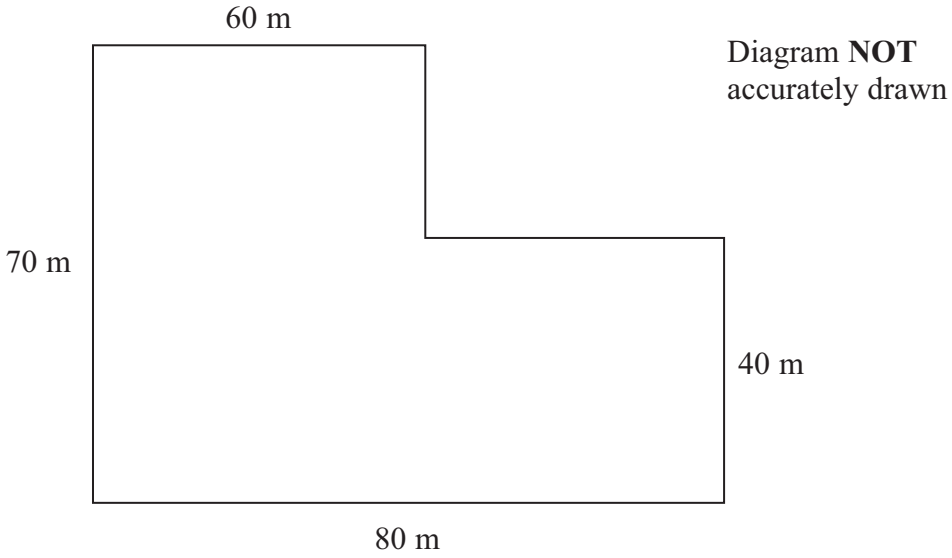


Diagram **NOT** accurately drawn

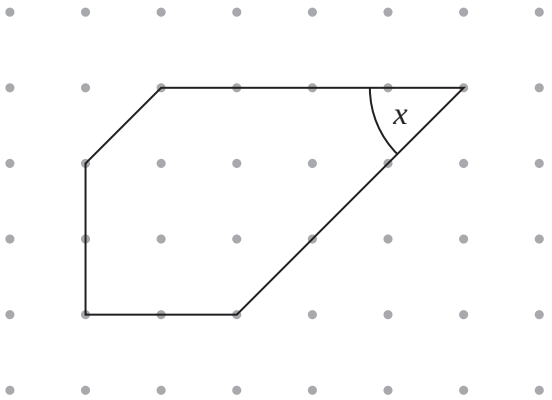
All the corners are right angles.
90% of the field is going to be used to grow wheat.

Work out the area of the field that is going to be used to grow wheat.

.....m^2

(Total for Question 17 is 5 marks)

8 Here is a 5-sided polygon on a dotted centimetre grid.



(a) Write down the mathematical name for a 5-sided polygon.

.....

(1)

(b) On the diagram, mark with arrows (>>) a pair of parallel lines.

(1)

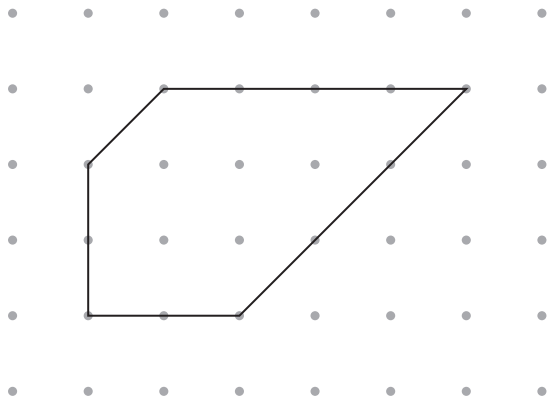
(c) What type of angle is the angle marked x?

.....

(1)

Here is the 5-sided polygon on a dotted centimetre grid.

(d) Work out the area of the 5-sided polygon.



.....

(2)

(Total for Question 8 is 5 marks)

***24** The diagram shows the plan of a small field.

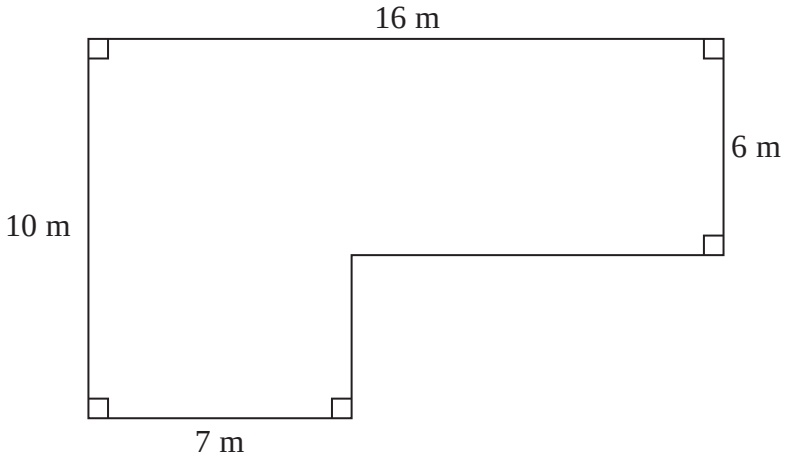


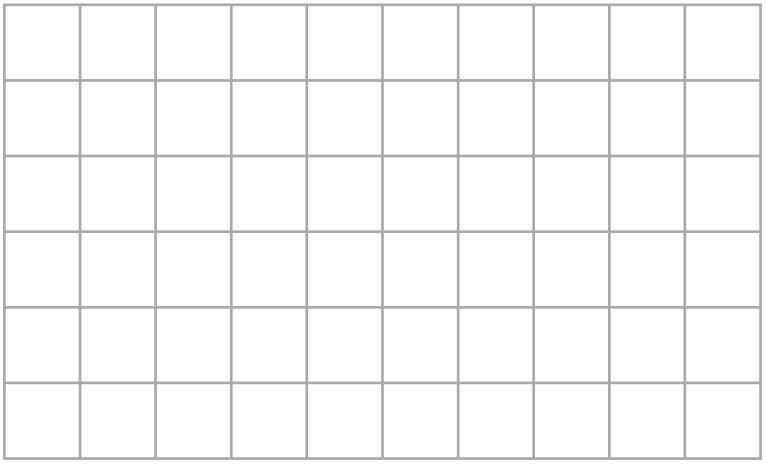
Diagram **NOT** accurately drawn

Kevin is going to keep some pigs in the field.
Each pig needs an area of 36 square metres.

Work out the greatest number of pigs Kevin can keep in the field.

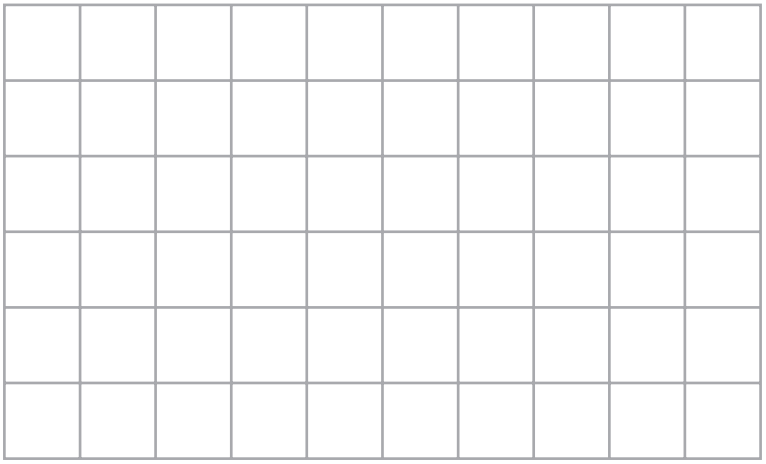
(Total for Question 24 is 4 marks)

11 (a) On the grid, draw a kite.



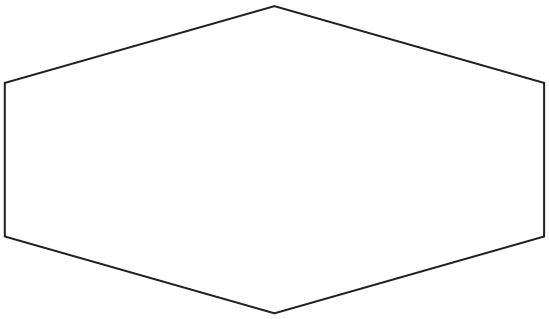
(1)

(b) On this grid, draw a rectangle with a perimeter of 14 cm.



(2)

Here is a hexagon.



(c) Draw all the lines of symmetry on this hexagon.

(2)

(Total for Question 11 is 5 marks)

13 The diagram shows a garden with 4 flower beds.
The garden is a rectangle, 23 m by 17 m.

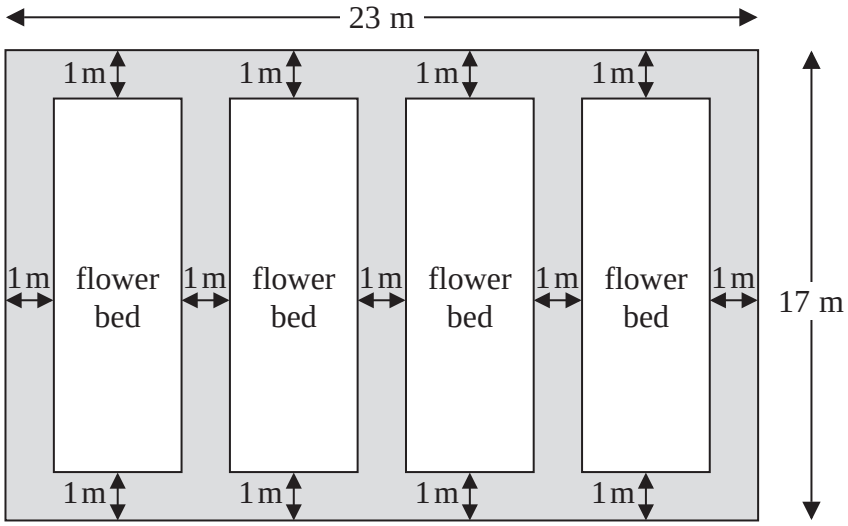


Diagram **NOT** accurately drawn

Each flower bed is a rectangle with the same length and the same width.

Work out the length and the width of a flower bed.

length = ... m

width = ... m

(Total for Question 13 is 3 marks)

28 The diagram shows a trapezium.

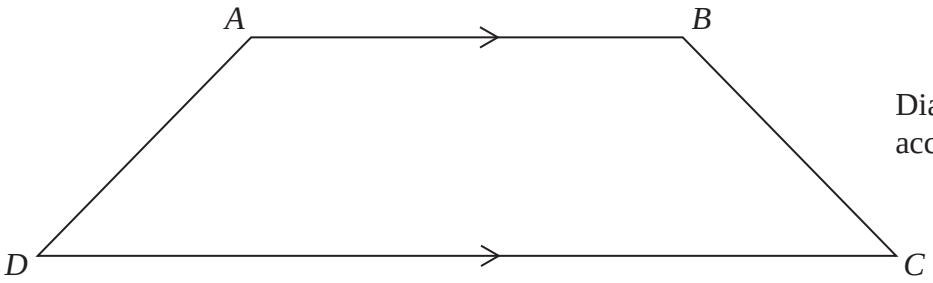


Diagram **NOT** accurately drawn

$AD = x$ cm.
BC is the same length as AD.
AB is twice the length of AD.
DC is 4 cm longer than AB.

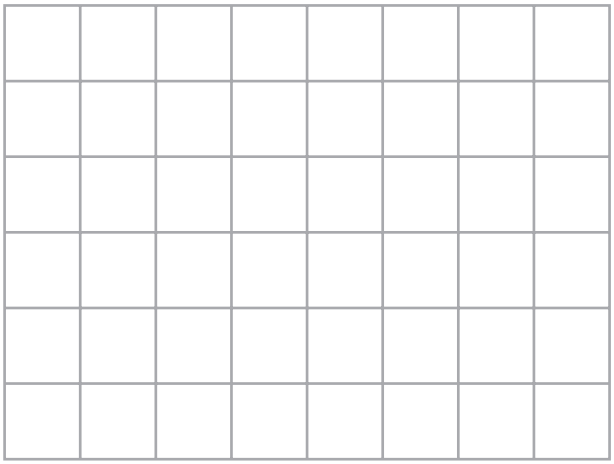
The perimeter of the trapezium is 38 cm.

Work out the length of AD.

..... cm

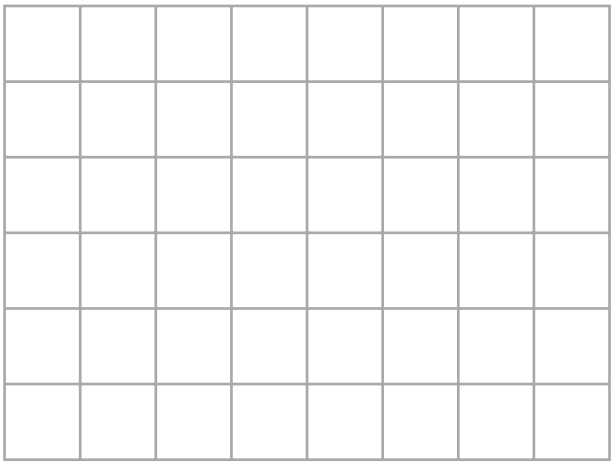
(Total for Question 28 is 4 marks)

1 (a) On the centimetre grid, draw a right-angled triangle.



(1)

(b) On the centimetre grid, draw a rectangle with an area of 12 cm^2.



(2)

(Total for Question 1 is 3 marks)

5 Howard is going to paint a wall.
He needs to buy some tins of paint.

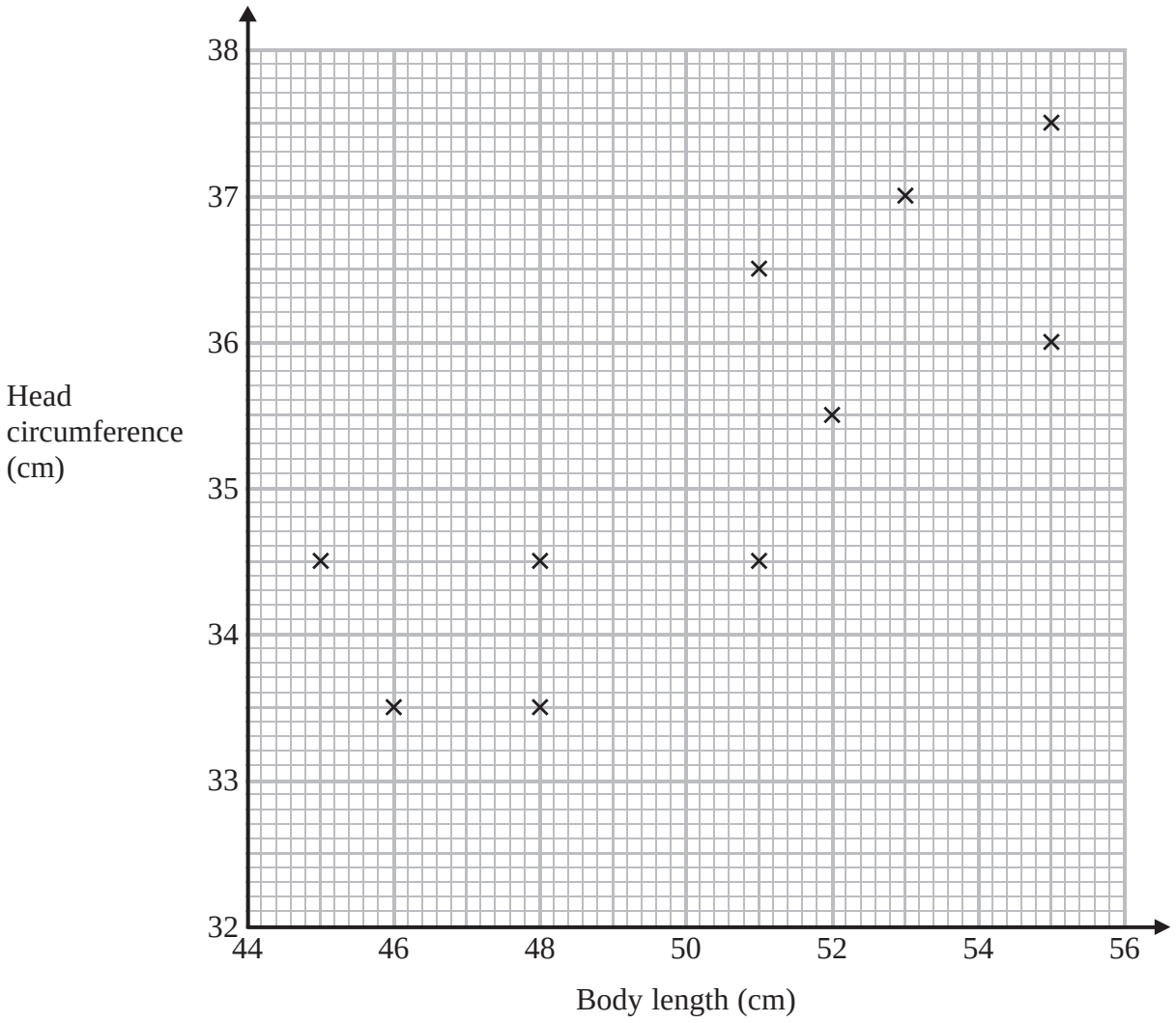
The area of the wall is 58 m^2.
Each tin of paint will cover an area of 12 m^2.

Work out the smallest number of tins of paint Howard needs to buy.

.....

(Total for Question 5 is 2 marks)

17 The scatter graph shows information about 10 newborn babies.
It shows each baby's body length and head circumference.



Another baby has a body length of 47 cm and head circumference 34 cm.

(a) Show this information on the scatter graph.

(1)

(b) What type of correlation does the scatter graph show?

.....

(1)

A baby has head circumference 35 cm.

(c) Estimate the body length of this baby.

..... cm

(2)

(Total for Question 17 is 4 marks)

15 A pattern is made using four identical rectangular tiles.

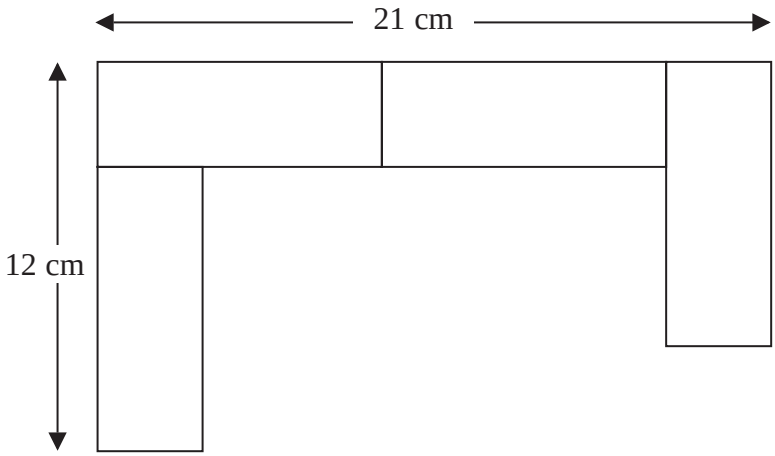


Diagram **NOT** accurately drawn

Find the total area of the pattern.

..... cm^2

(Total for Question 15 is 5 marks)

***7** The table gives information about the number of bricks and the amount of mortar needed to build some areas of brick wall.

Area of brick wall (m^2)	Number of bricks	Amount of mortar (bags)
1	60	2.4
2	120	4.8
3	180	7.2
4	240	9.6
5	300	12

Tony is going to build a brick wall.
The area of the brick wall will be 8 m^2.

Tony has 450 bricks and 20 bags of mortar.

Does Tony have enough bricks and enough bags of mortar to build the brick wall?
You must show your working.

(Total for Question 7 is 4 marks)

12 Harry is going to plant some bean plants in his garden.
The garden is in the shape of a rectangle 3 metres by 2 metres.

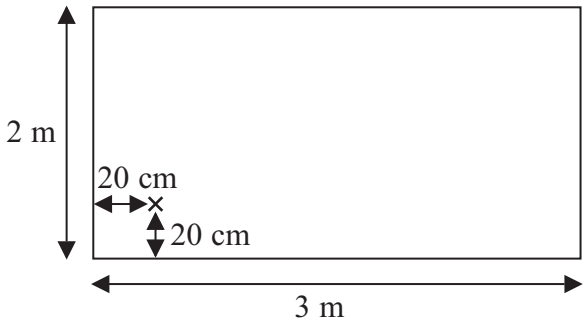


Diagram **NOT** accurately drawn

Harry will plant the first bean plant 20 cm from the edges of the garden, as shown in the diagram.

Harry will plant the bean plants in rows.
In each row, the space between plants will be 20 cm.
The space between rows will be 20 cm.

Work out the greatest number of bean plants Harry can plant in his garden.

.....

(Total for Question 12 is 4 marks)

26 The diagram shows the plan of a floor.

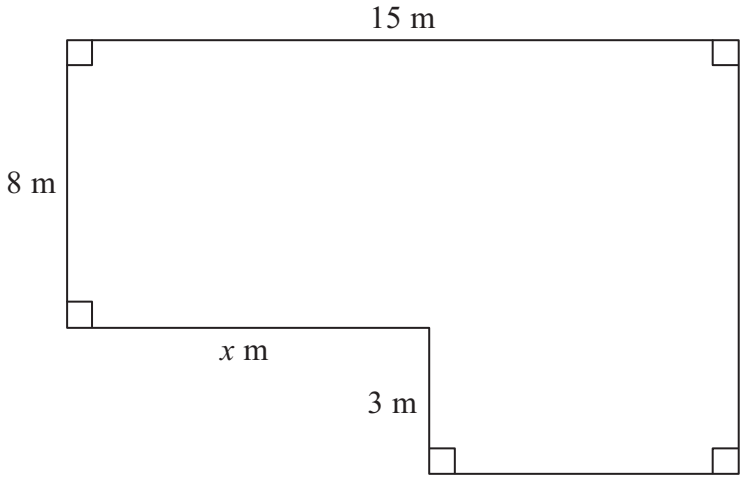


Diagram **NOT** accurately drawn

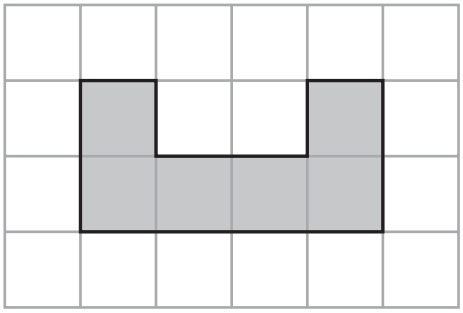
The area of the floor is 138 m^2.

Work out the value of x.

.....

(Total for Question 26 is 4 marks)

1 Here is a shaded shape on a centimetre grid.



(a) Find the area of the shaded shape.

.....cm^2

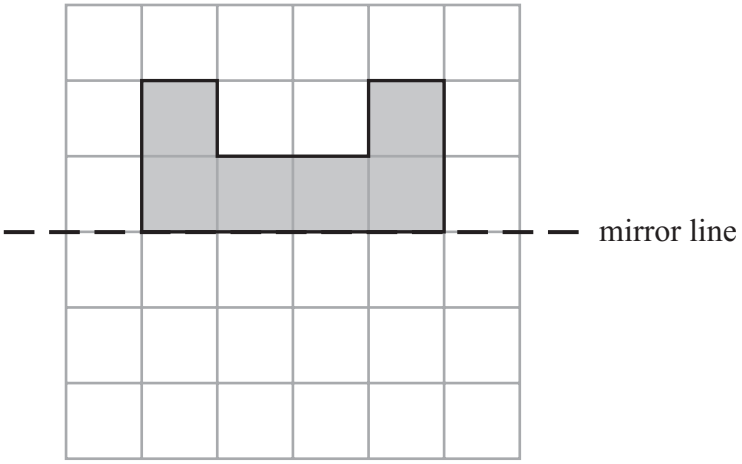
(1)

(b) Find the perimeter of the shaded shape.

.....cm

(1)

(c) On the grid below, reflect the shaded shape in the mirror line.



(1)

(Total for Question 1 is 3 marks)

18 Here is a rectangle.

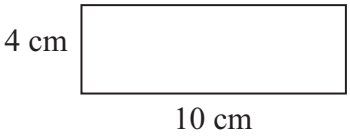
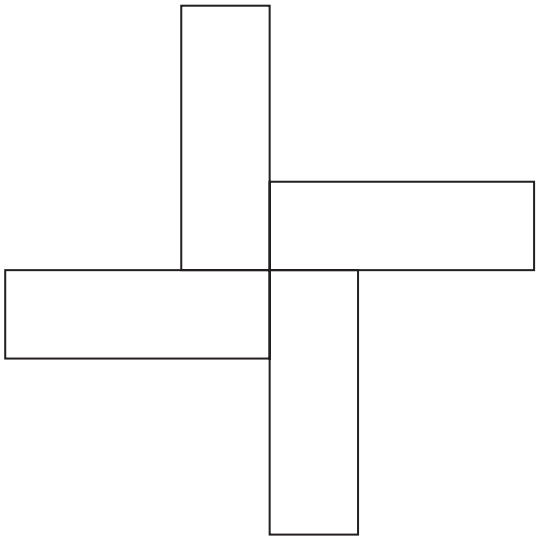


Diagram **NOT** accurately drawn

The 12-sided shape below is made from 4 of these rectangles.



Work out the perimeter of the shape.

.....cm

(Total for Question 18 is 3 marks)

***26** Saphia is organising a conference.
People at the conference will sit at circular tables.



Diagram **NOT** accurately drawn

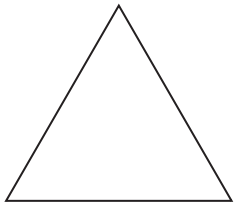
Each table has a diameter of 140 cm.
Each person needs 60 cm around the circumference of the table.

There are 12 of these tables in the conference room.
A total of 90 people will be at the conference.

Are there enough tables in the conference room?

(Total for Question 26 is 4 marks)

16 Here is an equilateral triangle.



(a) On the triangle, draw all the lines of symmetry.

(2)

(b) In the space below, use ruler and compasses to **construct** an equilateral triangle with sides of length 6 centimetres.
You must show all your construction lines.

(2)

Here is an equilateral triangle.

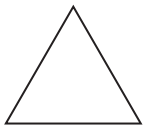
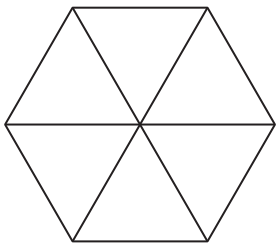


Diagram **NOT** accurately drawn

The perimeter of this equilateral triangle is 24 cm.

The hexagon below is made from 6 of these triangles.

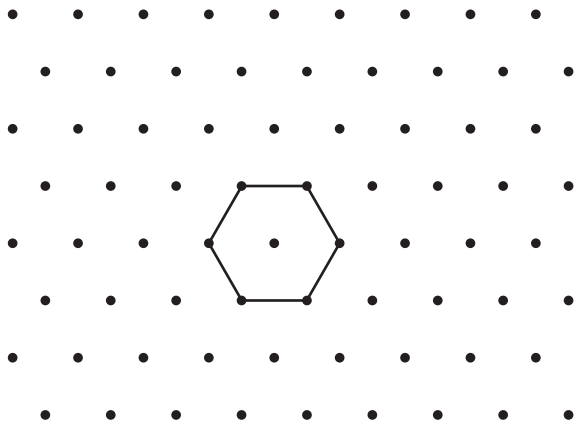


(c) Work out the perimeter of this hexagon.

..... cm

(2)

(d) On the grid below, show how the hexagon tessellates.
You should draw at least 6 hexagons.



(2)

(Total for Question 16 is 8 marks)

***25** The diagram shows the top of Levi's birthday cake.

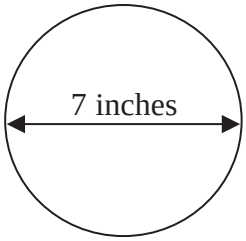


Diagram **NOT** accurately drawn

The top of the cake is in the shape of a circle.
The diameter of the circle is 7 inches.

A ribbon is going to be put around the side of the cake.
Ribbons are sold in 50 cm lengths.

1 inch is 2.54 cm.

Work out if one length of ribbon is long enough to go all the way around the cake.
You must show your working.

(Total for Question 25 is 4 marks)

23

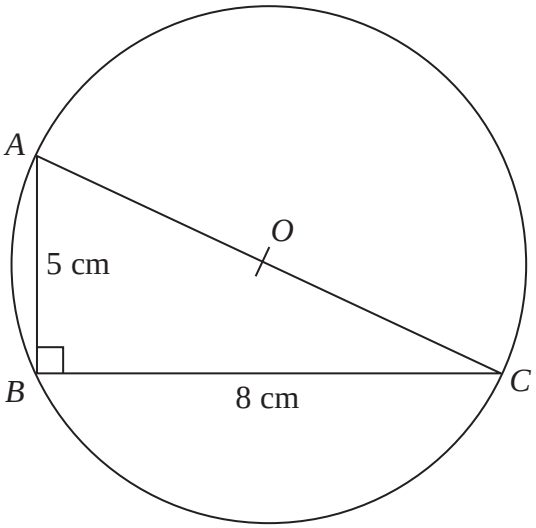


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.
A, *B* and *C* are points on the circumference of a circle centre *O*.
AB = 5 cm
BC = 8 cm

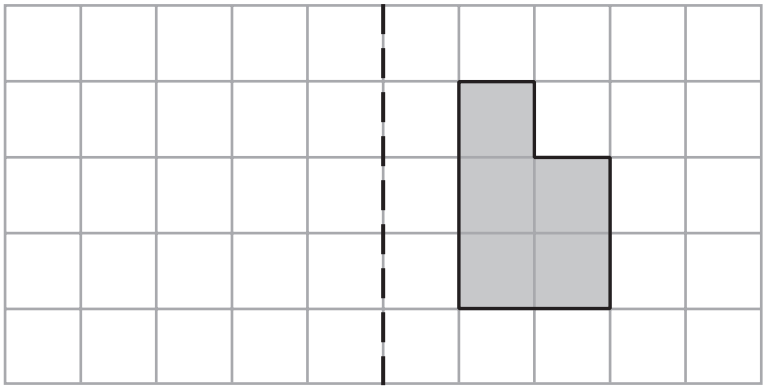
AOC is a diameter of the circle.

Calculate the circumference of the circle.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 23 is 4 marks)

11 Here is a shaded shape on a grid of centimetre squares.



(a) Find the perimeter of the shaded shape.

..... cm

(1)

(b) Reflect the shaded shape in the mirror line.

(2)

(Total for Question 11 is 3 marks)

***15** Here is a diagram of a garden.

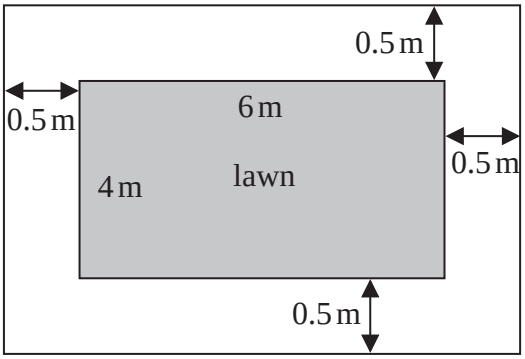


Diagram **NOT** accurately drawn

The lawn is a 6 m by 4 m rectangle.
Sabia is going to put a path all the way around the lawn.
The path will be 0.5 m wide.

Sabia is going to use paving stones to make the path.
Each paving stone is a 0.5 m by 0.5 m square.
She has 35 paving stones.

Has Sabia got enough paving stones?
You must show all your working.

(Total for Question 15 is 4 marks)

18

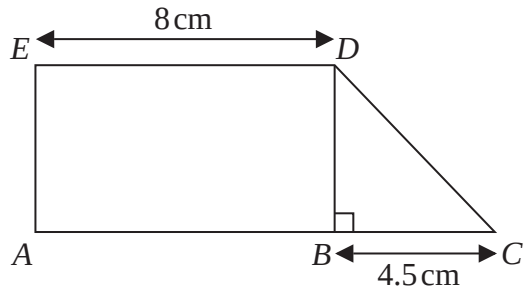


Diagram **NOT** accurately drawn

ABDE is a rectangle.
ED is 8 cm.

BDC is a right-angled triangle.
BC is 4.5 cm.

ABC is a straight line.

The area of the rectangle *ABDE* is 40 cm^2.
Work out the area of the triangle *BDC*.

..... cm^2

(Total for Question 18 is 3 marks)

*26 Here is part of a field.

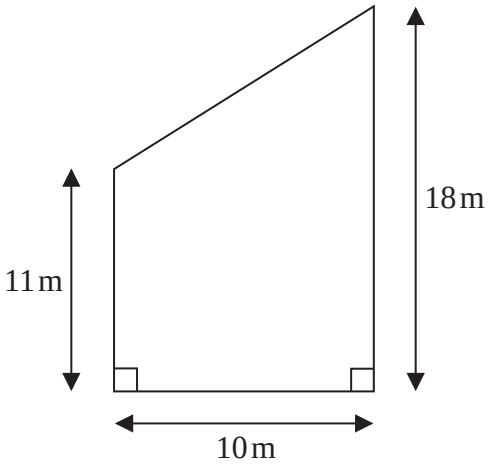


Diagram **NOT** accurately drawn

This part of the field is in the shape of a trapezium.
A farmer wants to put a fence all the way around the edge of this part of the field.

The farmer has 50 m of fence.

Does he have enough fence?
You must show all your working.

(Total for Question 26 is 5 marks)

14 Here is an equilateral triangle.

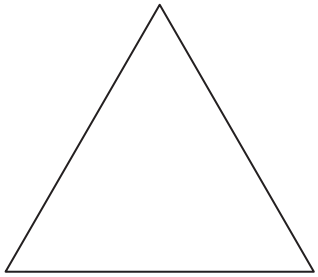
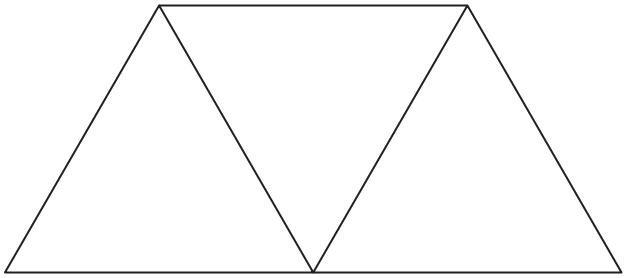


Diagram **NOT** accurately drawn

The equilateral triangle has a perimeter of 24 cm.

Three of these equilateral triangles are used to make this trapezium.

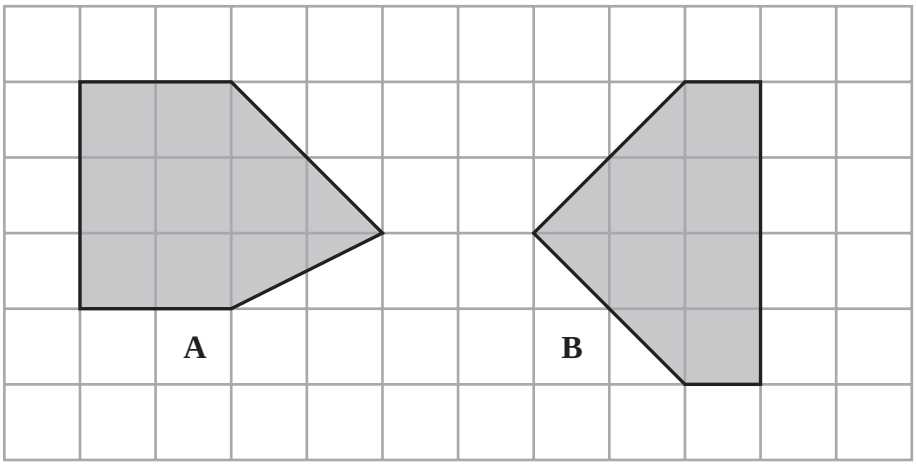


Work out the perimeter of the trapezium.

..... cm

(Total for Question 14 is 3 marks)

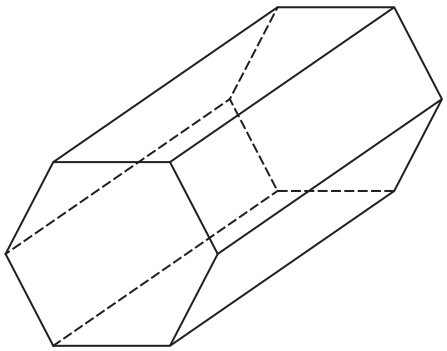
*9 Shape **A** and shape **B** are drawn on a centimetre grid.



One shape has a greater area than the other.
How much greater?

(Total for Question 9 is 3 marks)

19 The diagram shows a prism.



(a) (i) Write down how many vertices the prism has.

.....

(ii) Write down how many faces the prism has.

.....

(2)

The cross section of the prism is a regular hexagon.

(b) In the space below, sketch a net of the prism.

(2)

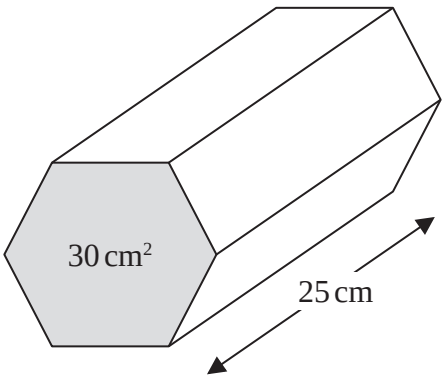


Diagram **NOT** accurately drawn

The area of the cross section of the prism is 30 cm^2.
The length of the prism is 25 cm.

(c) Work out the volume of the prism.

.....

(3)

(Total for Question 19 is 7 marks)

21 The diagram shows a rectangle.

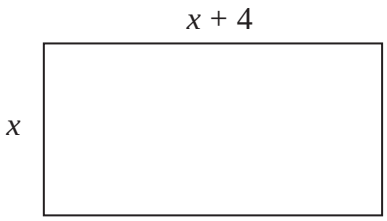


Diagram **NOT** accurately drawn

All measurements are given in centimetres.

The perimeter of the rectangle is 45 cm.

Work out the value of x.

x = ...

(Total for Question 21 is 3 marks)

16

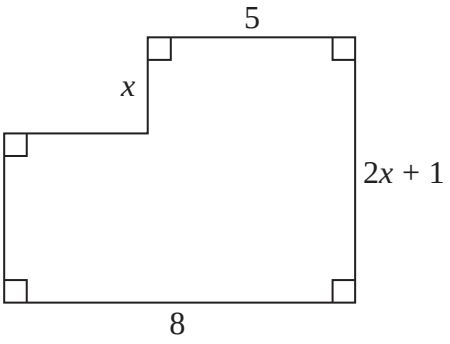


Diagram **NOT** accurately drawn

Here is a shape.
All the measurements are in metres.

The area of the shape is $A\text{m}^2$.

Find a formula for A in terms of x.

.....

(Total for Question 16 is 3 marks)

***13** Acres and hectares are units of area.

1 hectare = 2.47 acres

There are two farms for sale.

The area of farm A is 80 acres.
The area of farm B is 35 hectares.

Which farm has the greater area?
You must show all your working.

(Total for Question 13 is 3 marks)

23 The diagram shows a path around a pond.

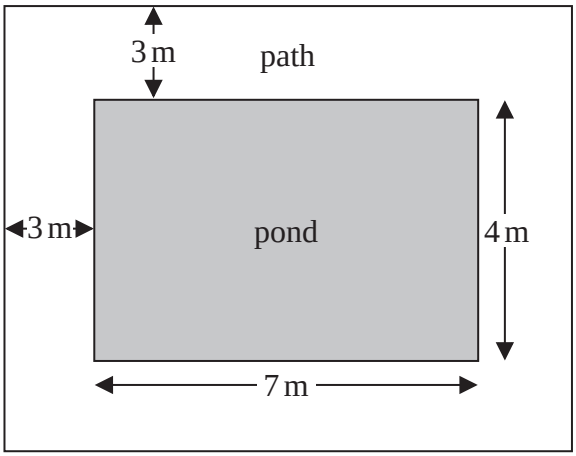


Diagram **NOT** accurately drawn

The pond is in the shape of a rectangle with length 7 m and width 4 m.
The path is 3 m wide.

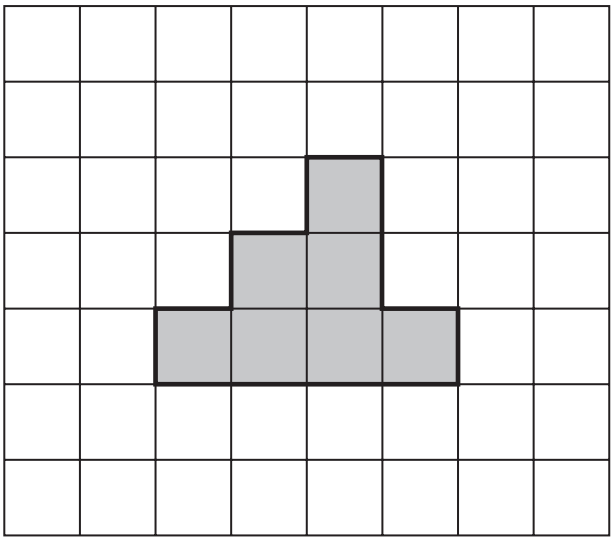
Ali is going to cover the path with gravel.
One bag of gravel will cover 10 m^2 of the path.

How many bags of gravel does Ali need to buy?
You must show your working.

..... bags

(Total for Question 23 is 4 marks)

11 Here is a shaded shape drawn on a centimetre grid.



(a) Work out the perimeter of this shape.

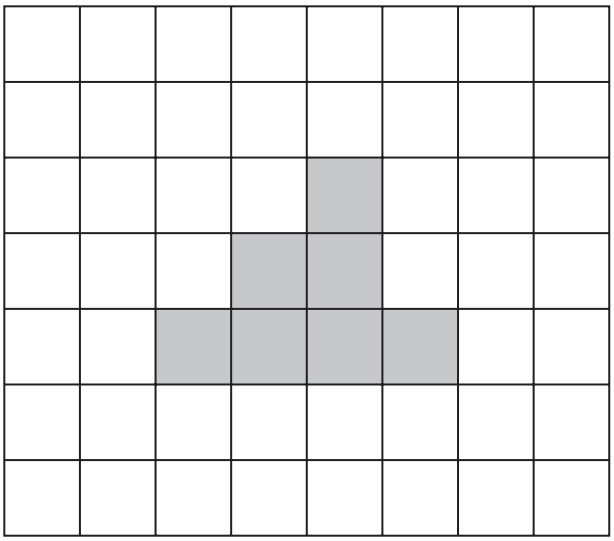
.....

(2)

(b) What fraction of the grid is shaded?
Give your answer in its simplest form.

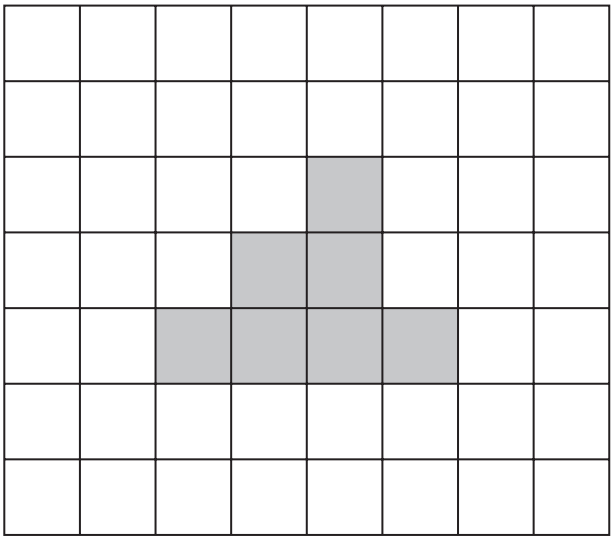
.....

(2)



(c) On the grid above, shade in 3 more squares so that the completed shape has exactly one line of symmetry.

(1)



(d) On this grid, shade in 3 more squares so that the completed shape has rotational symmetry of order 2

(1)

(Total for Question 11 is 6 marks)

28 The diagram shows a square *ABCD* inside a circle.

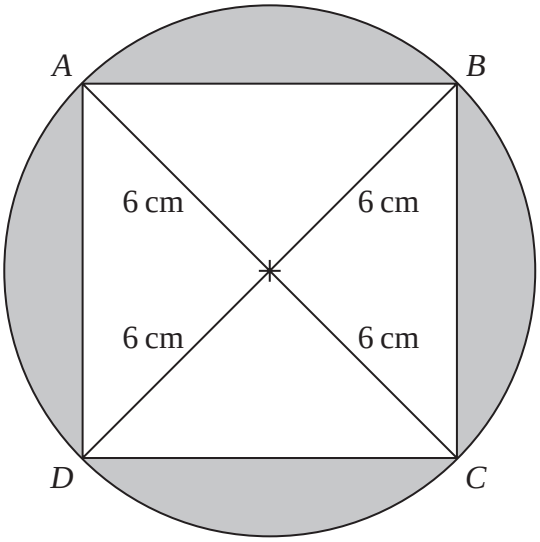


Diagram **NOT** accurately drawn

The points *A*, *B*, *C* and *D* lie on the circle.

The radius of the circle is 6 cm.

Work out the total area of the shaded regions.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 28 is 4 marks)

Question 63

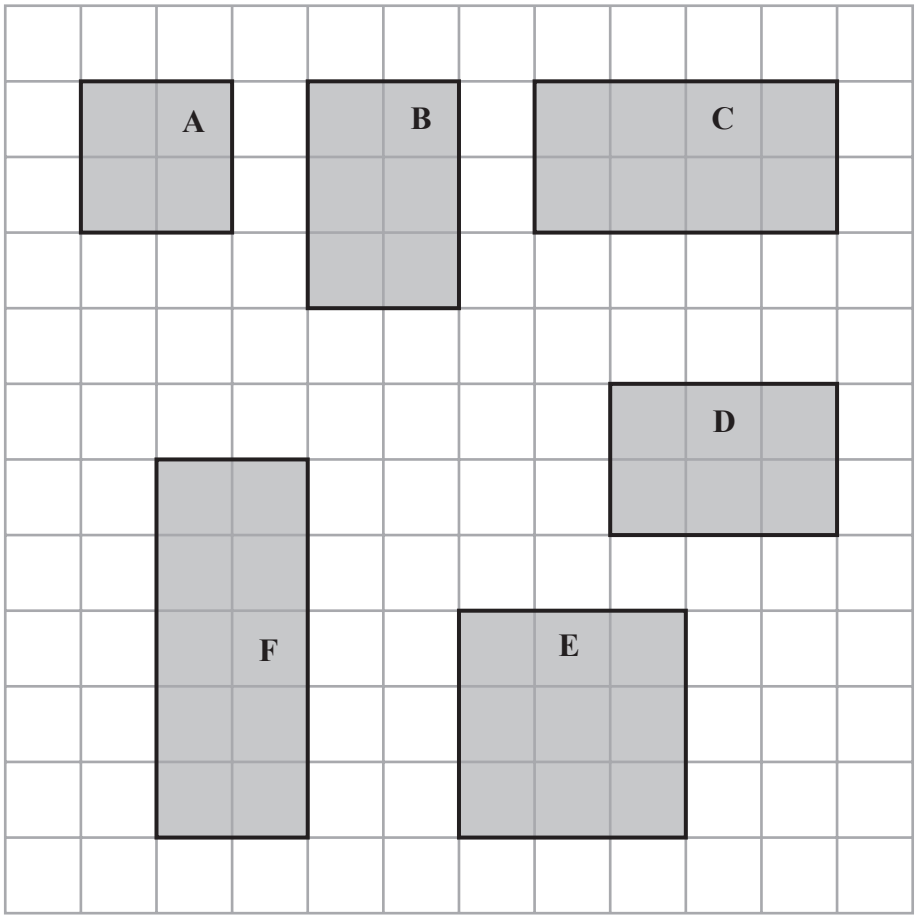
11 An equilateral triangle has sides of length 8 cm.
A square has the same perimeter as the triangle.

Work out the area of the square.

.....

(Total for Question 11 is 5 marks)

3 Here are six shapes drawn on a centimetre grid.



Two of the shapes are congruent.

(a) Write down the letters of these two shapes.

..... and .....

(1)

One of the shapes is similar to shape **A**.

(b) Write down the letter of this shape.

.....

(1)

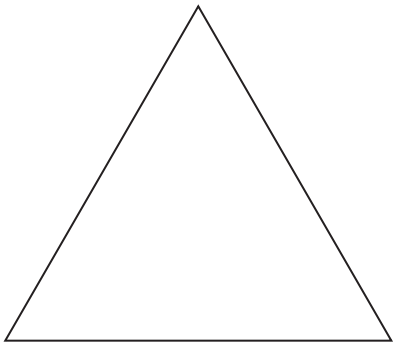
(c) Find the area of shape **F**.

..... cm^2

(1)

(Total for Question 3 is 3 marks)

12 Here is an equilateral triangle.



(a) On the triangle, draw all the lines of symmetry.

(2)

The diagram shows a square and its diagonals.

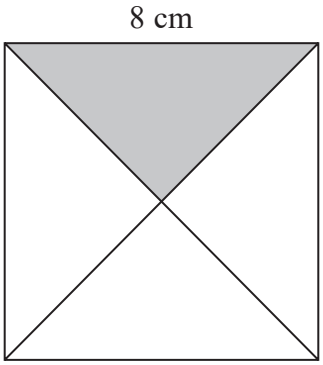


Diagram **NOT** accurately drawn

The square has sides of length 8 cm.

(b) Work out the area of the shaded triangle.

.....cm^2

(3)

(Total for Question 12 is 5 marks)

13 The diagram shows an equilateral triangle and a rectangle.

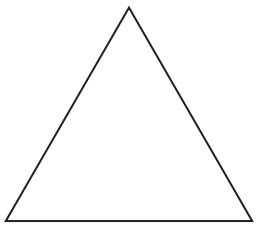




Diagram **NOT** accurately drawn

The perimeter of the equilateral triangle is the same as the perimeter of the rectangle.

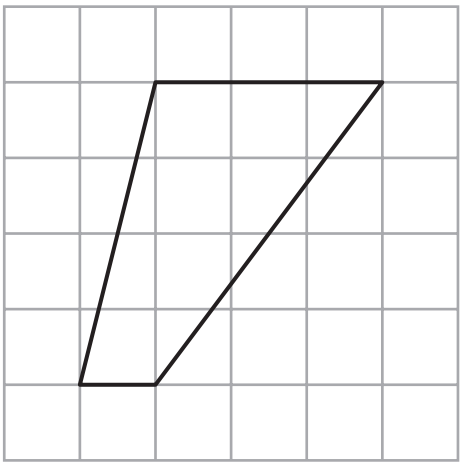
The length of the rectangle is 11 cm.

Work out the width of the rectangle.

..... cm

(Total for Question 13 is 3 marks)

15 A quadrilateral has been drawn on a centimetre grid.



(a) Write down the mathematical name of this quadrilateral.

.....

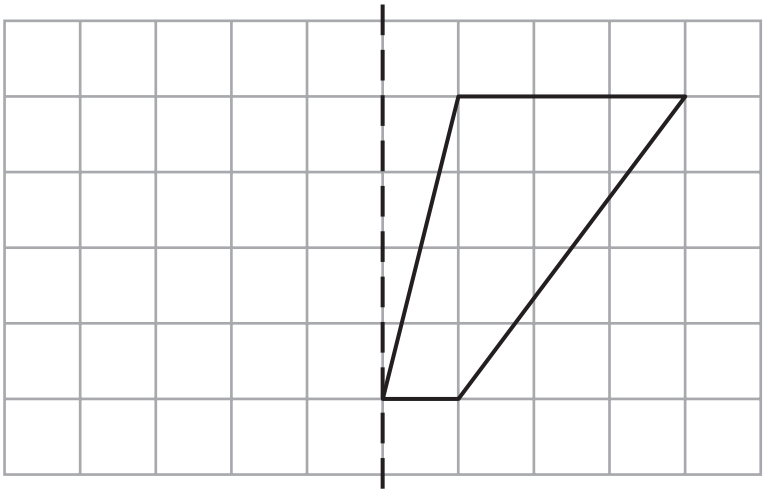
(1)

(b) Work out the area of the quadrilateral.

..... cm^2

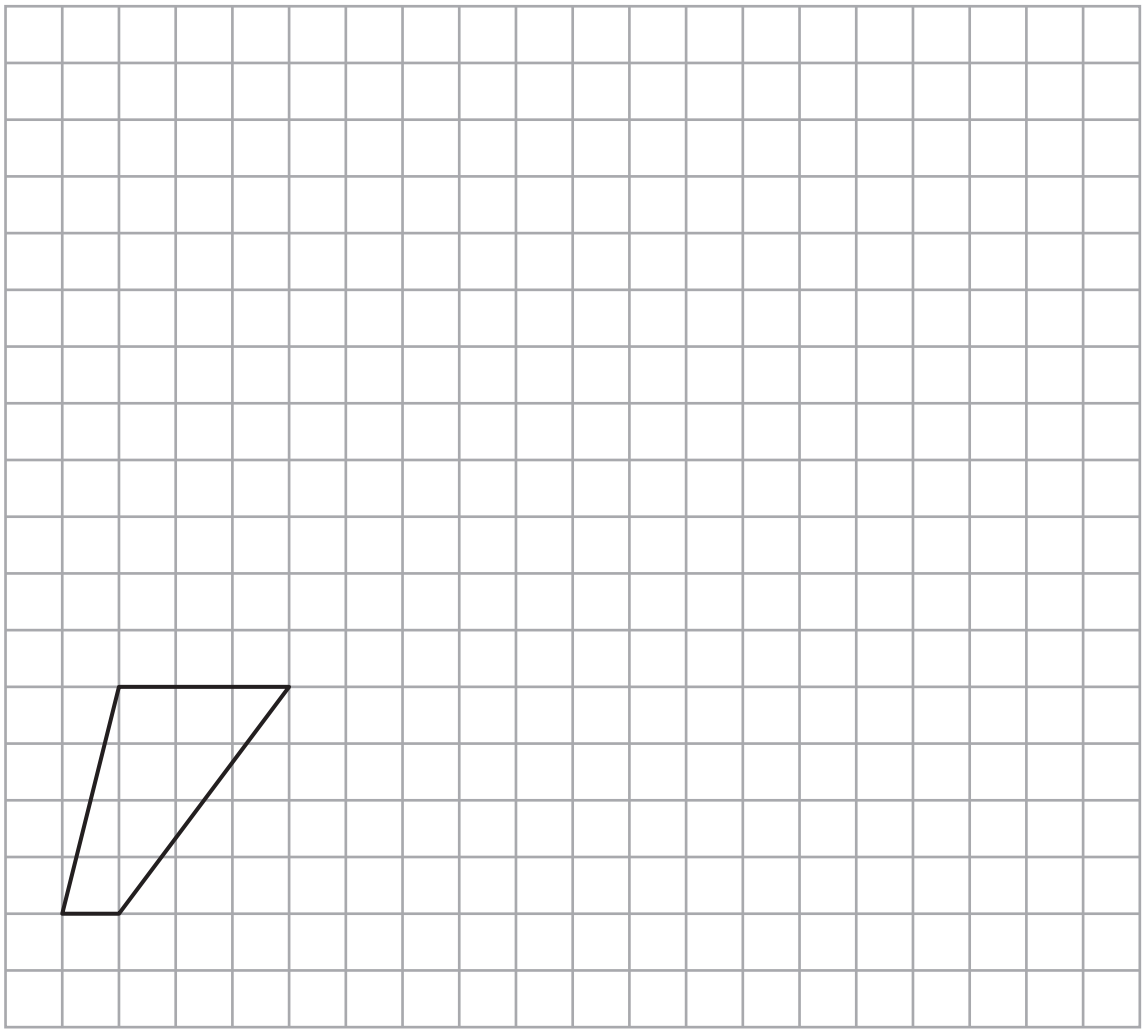
(2)

(c) On the grid below, reflect the quadrilateral in the mirror line.



mirror line

(2)

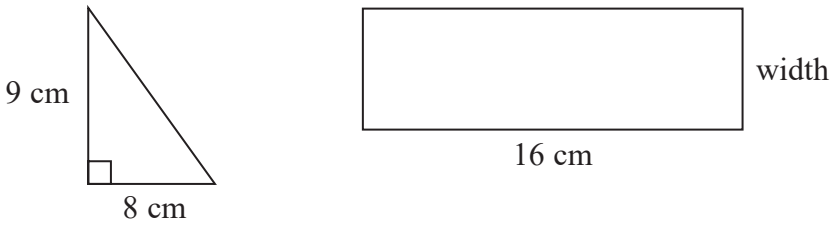


(d) On the grid, draw an enlargement of the quadrilateral with a scale factor of 3

(2)

(Total for Question 15 is 7 marks)

15 Here are a triangle and a rectangle.



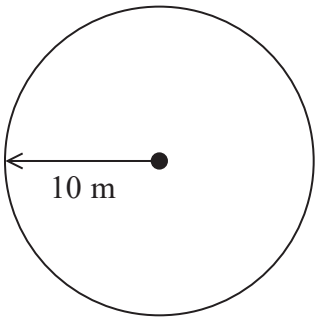
The area of the rectangle is 6 times the area of the triangle.

Work out the width of the rectangle.

..... cm

(Total for Question 15 is 4 marks)

18 Balena has a garden in the shape of a circle of radius 10 m.
He is going to cover the garden with grass seed to make a lawn.



Grass seed is sold in boxes.
Each box of grass seed will cover 46 m^2 of garden.

Balena wants to cover all the garden with grass seed.

(a) Work out an estimate for the number of boxes of grass seed Balena needs.
You must show your working.

.....

(4)

(b) Is your estimate for part (a) an underestimate or an overestimate?
Give a reason for your answer.

.....

.....

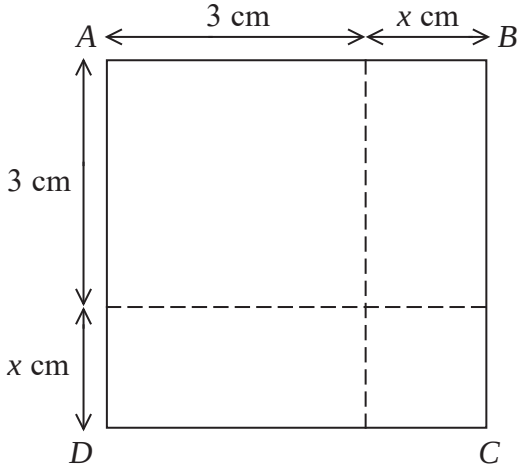
.....

.....

(1)

(Total for Question 18 is 5 marks)

24



The area of square $ABCD$ is 10 cm^2.

Show that $x^2 + 6x = 1$

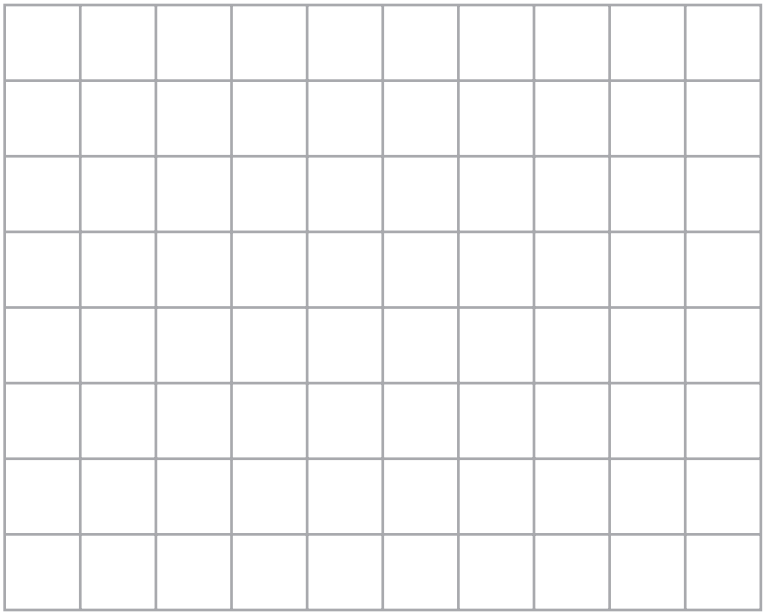
(Total for Question 24 is 3 marks)

Question 71

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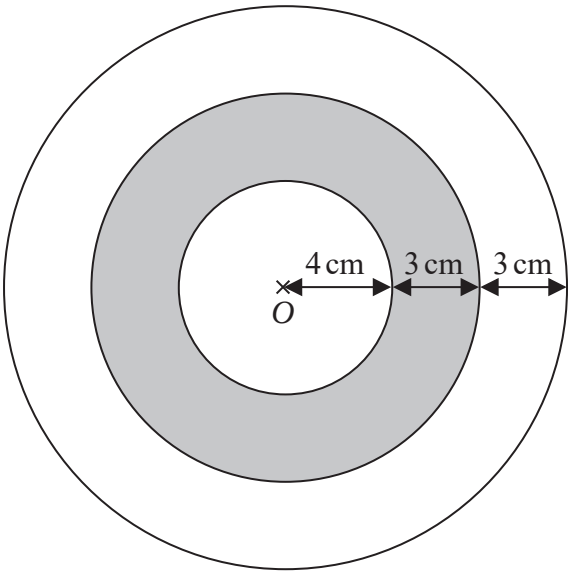
8 The length of a rectangle is twice as long as the width of the rectangle.
The area of the rectangle is 32 cm^2.

Draw the rectangle on the centimetre grid.



(Total for Question 8 is 2 marks)

26 The diagram shows a logo made from three circles.



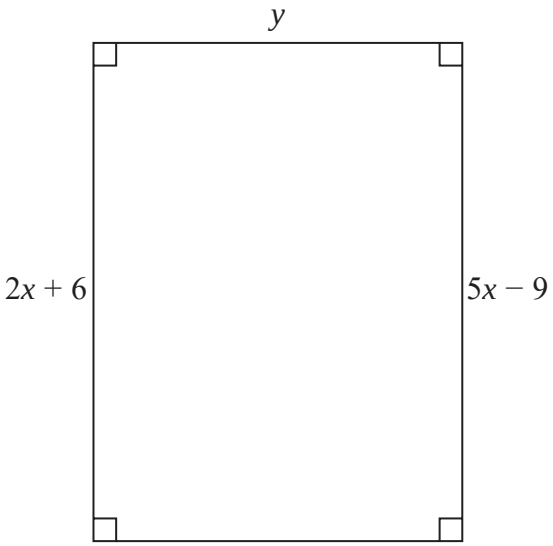
Each circle has centre O.

Daisy says that exactly $\frac{1}{3}$ of the logo is shaded.

Is Daisy correct?
You must show all your working.

(Total for Question 26 is 4 marks)

28 Here is a rectangle.



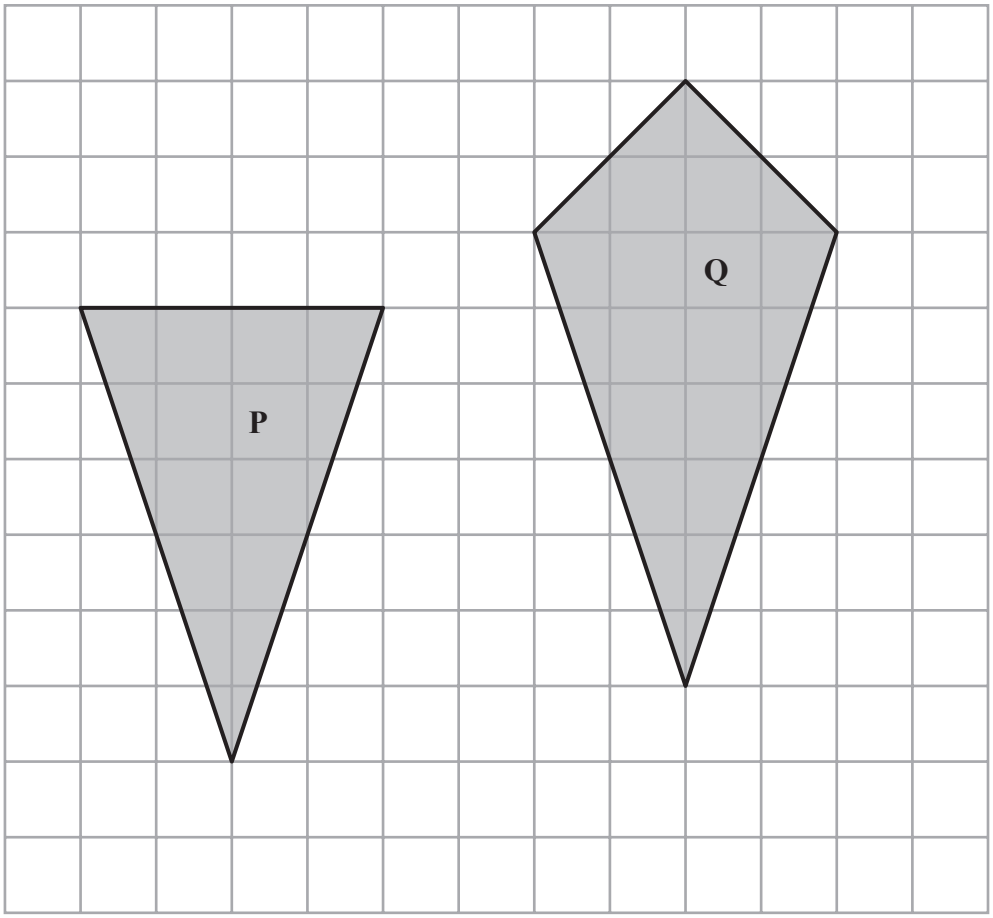
All measurements are in centimetres.

The area of the rectangle is 48 cm^2.

Show that $y = 3$

(Total for Question 28 is 4 marks)

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)

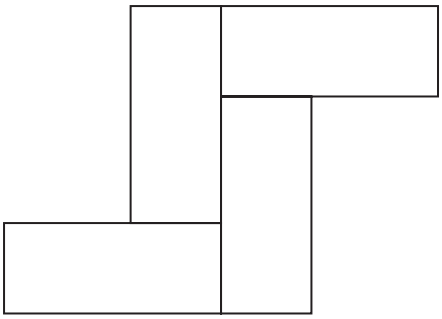
(Total for Question 10 is 3 marks)

24 Here is a rectangle.



The length of the rectangle is 7 cm longer than the width of the rectangle.

4 of these rectangles are used to make this 8-sided shape.



The perimeter of the 8-sided shape is 70 cm.

Work out the area of the 8-sided shape.

..... cm^2

(Total for Question 24 is 5 marks)

25 A force of 70 newtons acts on an area of $20\,cm^2$

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The force is increased by 10 newtons.
The area is increased by $10\,cm^2$

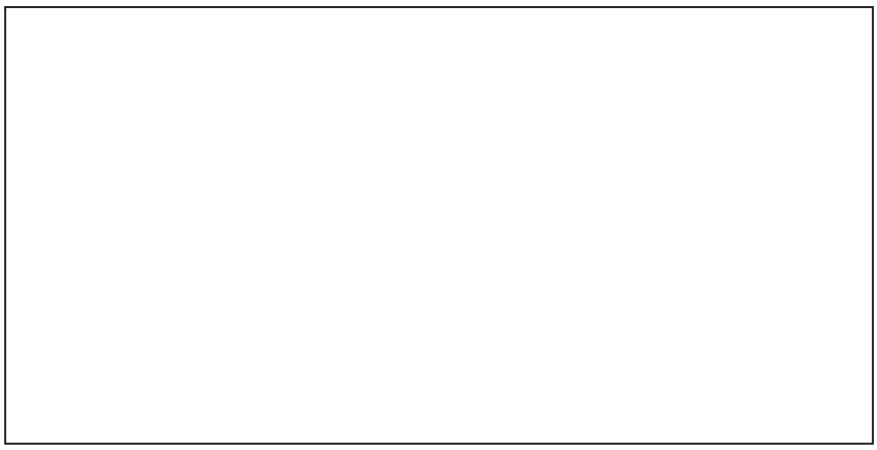
Helen says,

"The pressure decreases by less than 20%"

Is Helen correct?
You must show how you get your answer.

(Total for Question 25 is 3 marks)

12 The diagram shows a scale drawing of a tennis court.



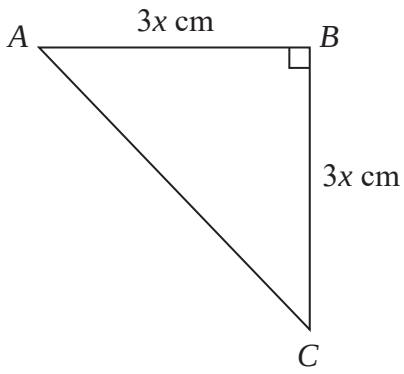
The scale of the drawing is 1 : 200

Work out the perimeter of the real tennis court.
Give your answer in metres.

..... metres

(Total for Question 12 is 5 marks)

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



The area of the triangle is 162 cm^2

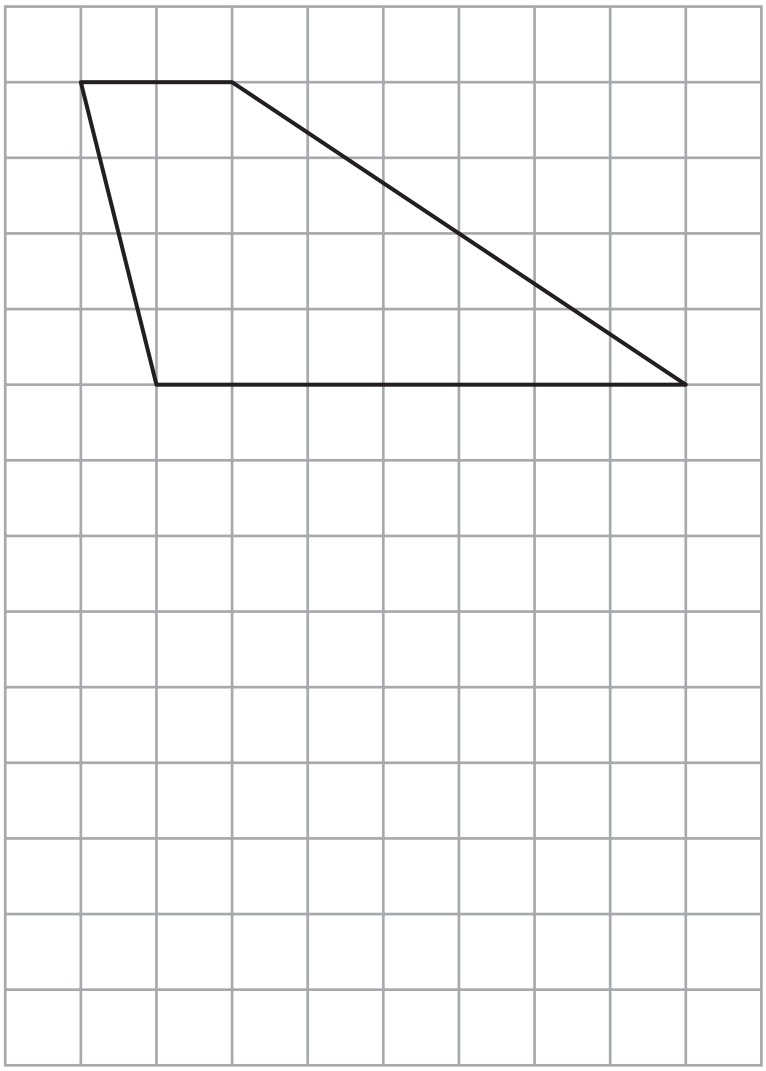
Work out the value of x.

$x =$ .....

(Total for Question 17 is 3 marks)

Question 79

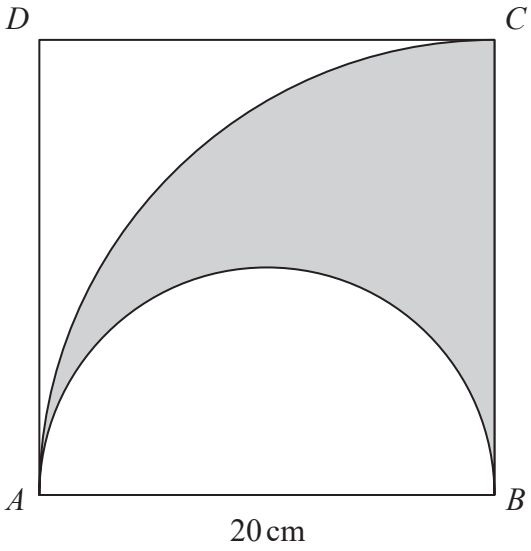
21 Here is a trapezium drawn on a centimetre grid.



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

(Total for Question 21 is 2 marks)

26 The diagram shows a square $ABCD$ with sides of length 20 cm.
It also shows a semicircle and an arc of a circle.

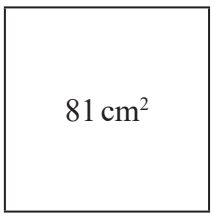


AB is the diameter of the semicircle.
AC is an arc of a circle with centre B.

Show that $\dfrac{\text{area of shaded region}}{\text{area of square}} = \dfrac{\pi}{8}$

(Total for Question 26 is 4 marks)

13 A square has an area of $81\,cm^2$

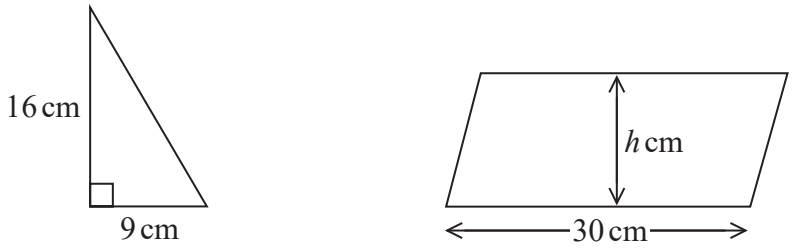


(a) Find the perimeter of the square.

.....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 cm.

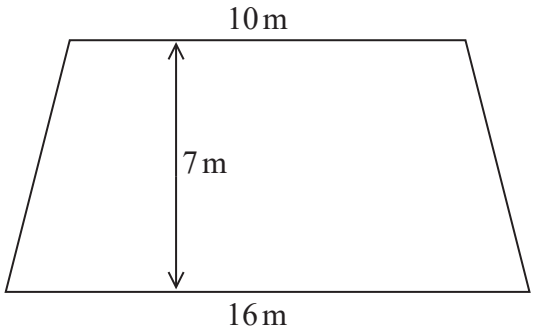
(b) Find the value of h.

$h =$ .....

(3)

(Total for Question 13 is 5 marks)

24 The diagram shows a floor in the shape of a trapezium.





£16.99

John is going to paint the floor.

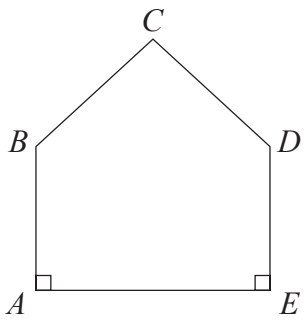
Each 5 litre tin of paint costs £16.99
1 litre of paint covers an area of 2 m^2

John has £160 to spend on paint.

Has John got enough money to buy all the paint he needs?
You must show how you get your answer.

(Total for Question 24 is 5 marks)

17 The diagram shows a pentagon.
The pentagon has one line of symmetry.



$AE = 4x$
$AB = 2x + 1$
$BC = x + 2$

All these measurements are given in centimetres.

The perimeter of the pentagon is 18 cm.

(a) Show that $10x + 6 = 18$

(3)

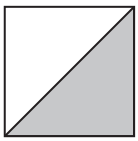
(b) Find the value of x.

$x =$ .....

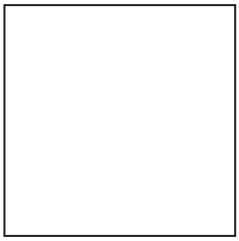
(2)

(Total for Question 17 is 5 marks)

20 Here are two squares, **A** and **B**.



A



B

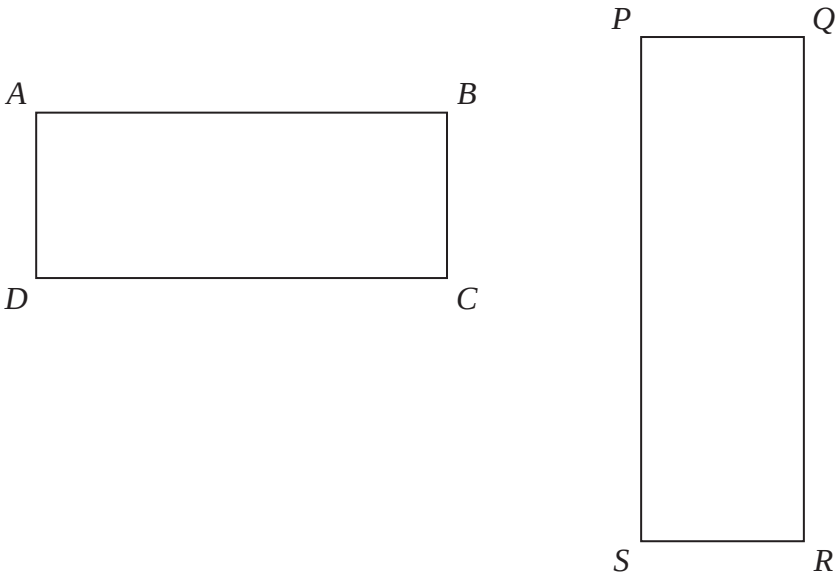
The length of the side of square **A** is 50% of the length of the side of square **B**.

Express the area of the shaded region of square **A** as a percentage of the area of square **B**.

..... %

(Total for Question 20 is 3 marks)

28 Here are two rectangles.



$QR = 10\,\text{cm}$
$BC = PQ$

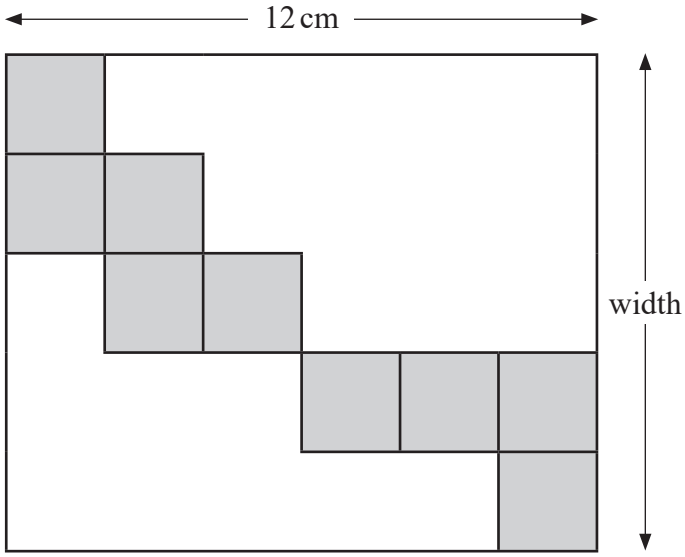
The perimeter of $ABCD$ is 26 cm
The area of $PQRS$ is $45\,\text{cm}^2$

Find the length of AB.

..... cm

(Total for Question 28 is 4 marks)

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.

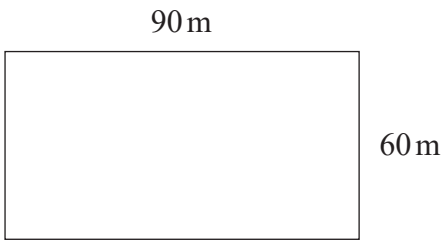
..... cm

(Total for Question 13 is 3 marks)

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.

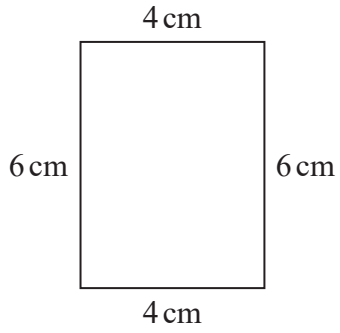
Work out the area of the garden that is grass.



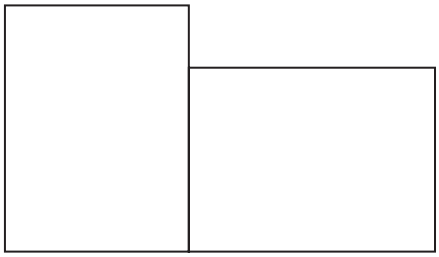
.....m^2

(Total for Question 15 is 4 marks)

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

(Total for Question 16 is 3 marks)

14 Here is a rectangle.



Coby has to find the perimeter of this rectangle.

He writes,

Perimeter = 7×3

(a) What mistake has Coby made?

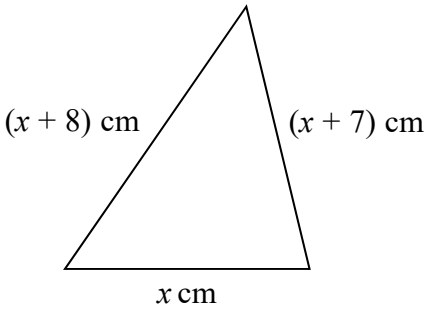
.....

.....

.....

(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.

.....

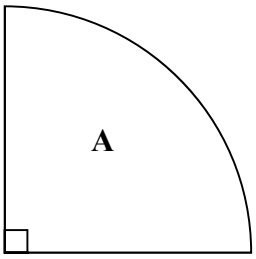
.....

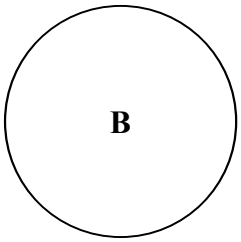
.....

(1)

(Total for Question 14 is 2 marks)

30 **A** is in the shape of a quarter circle of radius 15 cm.
B is in the shape of a circle.



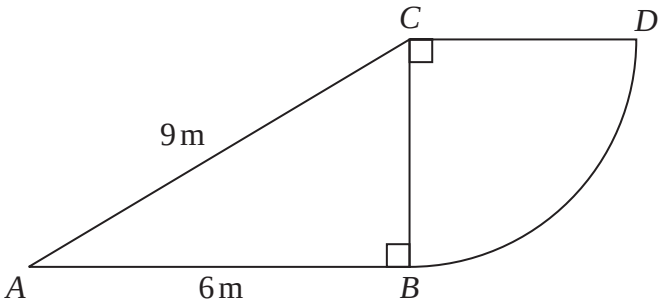


The area of **A** is 9 times the area of **B**.

Show that the radius of **B** is 2.5 cm.

(Total for Question 30 is 3 marks)

27 The diagram shows a right-angled triangle and a quarter circle.



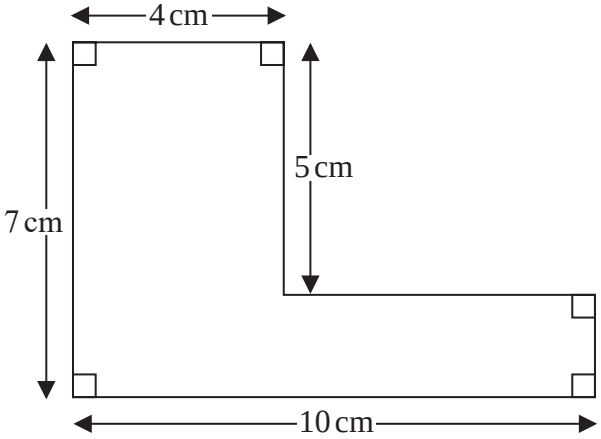
The right-angled triangle *ABC* has angle *ABC* = 90°
The quarter circle has centre *C* and radius *CB*.

Work out the area of the quarter circle.
Give your answer correct to 3 significant figures.
You must show all your working.

..... m^2

(Total for Question 27 is 4 marks)

13



Work out the perimeter of this shape.

..... cm

(Total for Question 13 is 2 marks)

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.

.....

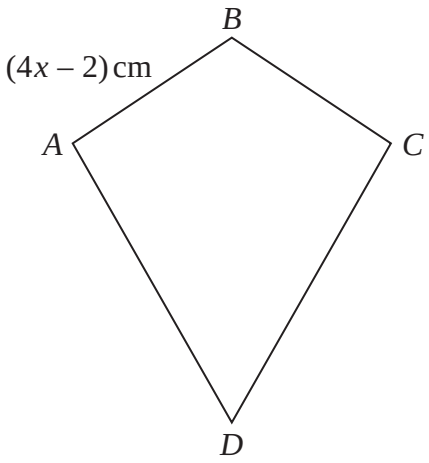
.....

.....

(1)

(Total for Question 26 is 5 marks)

16 *ABCD* is a kite.



$AB = (4x - 2)$ cm

Jasper says that x could be 0.5

(a) Explain why Jasper cannot be correct.

.....

.....

.....

(1)

$AD = 3AB$
The kite has a perimeter of 64 cm.

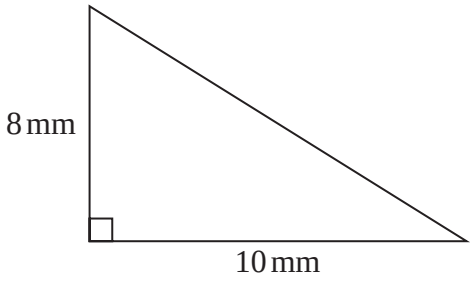
(b) Find the value of x.

$x =$.....

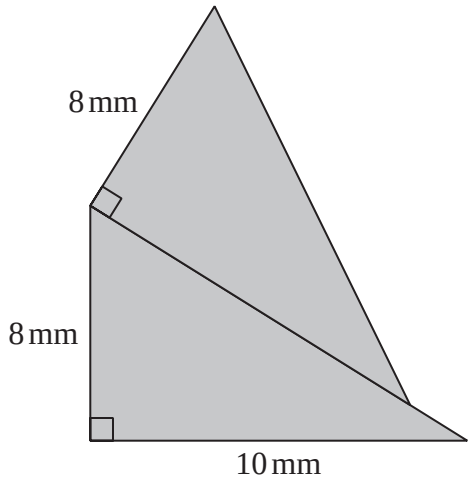
(3)

(Total for Question 16 is 4 marks)

25 Here is a right-angled triangle.



The shaded shape below is made from two of these triangles.



Work out the perimeter of the shaded shape.
Give your answer correct to 3 significant figures.

..... mm

(Total for Question 25 is 4 marks)

13 In the Northern hemisphere the ratio of the area of land to the area of water is 2 : 3

(a) Work out what percentage of the area of the Northern hemisphere is land.

.....%

(2)

20% of the area of the Southern hemisphere is land.

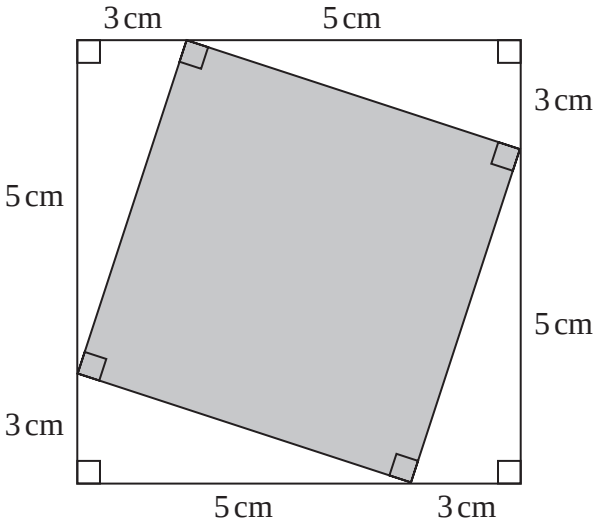
(b) Work out the ratio of the area of land to the area of water in the Southern hemisphere.

.....

(2)

(Total for Question 13 is 4 marks)

19 This diagram shows two squares.

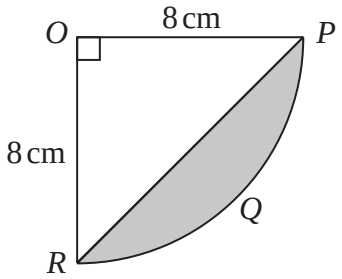


Work out the area of the square shown shaded in the diagram.

.....

(Total for Question 19 is 4 marks)

27 The diagram shows a sector $OPQR$ of a circle, centre O and radius 8 cm.



OPR is a triangle.

Work out the area of the shaded segment PQR.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 27 is 4 marks)

24 Festival A will be in a rectangular field with an area of 80 000 m^2
The greatest number of people allowed to attend Festival A is 425

Festival B will be in a rectangular field 700 m by 2000 m.
The greatest number of people allowed to attend Festival B is 6750

The area per person allowed for Festival B is greater than the area per person allowed for Festival A.

(a) How much greater?
Give your answer correct to the nearest whole number.

..... m^2
(4)

Callum says,

"300 cm^2 is the same as 3 m^2 because there are 100 cm in 1 m so you divide by 100"

Callum's method is wrong.

(b) Explain why.

.....

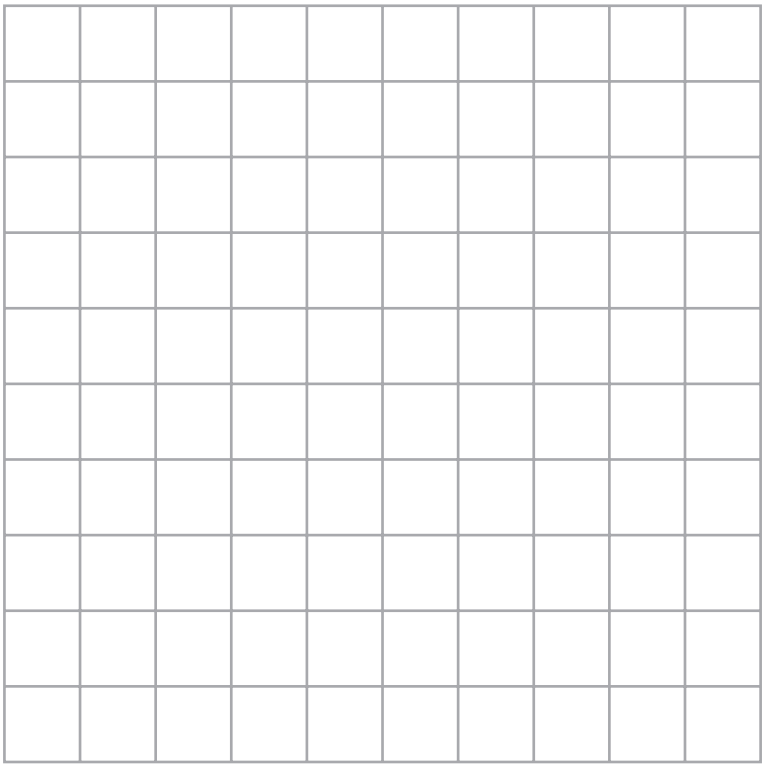
.....

.....

(1)

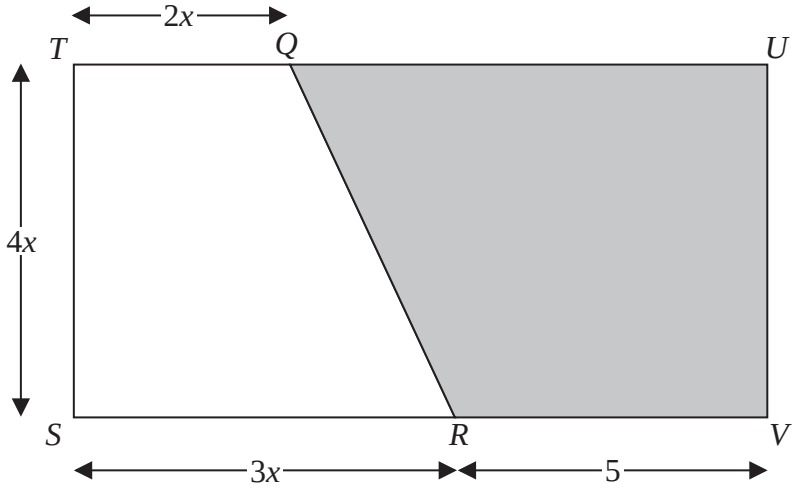
(Total for Question 24 is 5 marks)

16 On the centimetre grid, draw an isosceles triangle with an area of $12\,cm^2$



(Total for Question 16 is 2 marks)

28 The diagram shows rectangle *STUV*.
TQU and *SRV* are straight lines.
All measurements are in cm.

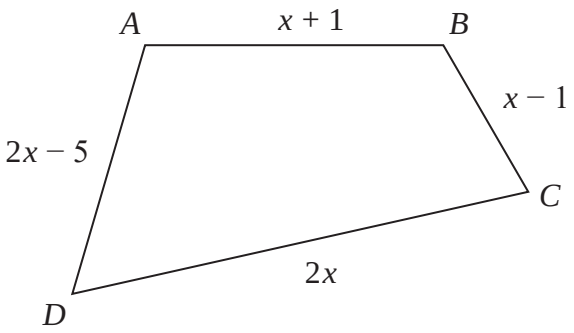


The area of trapezium *QUVR* is $A\,\text{cm}^2$

Show that $A = 2x^2 + 20x$

(Total for Question 28 is 3 marks)

16 Here is a quadrilateral *ABCD*.



All the measurements are in centimetres.

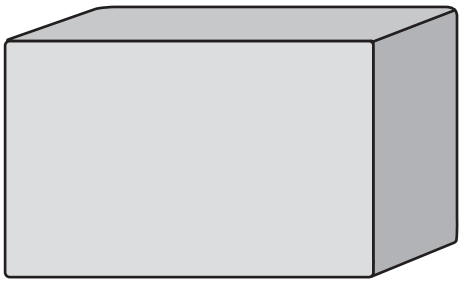
The perimeter of *ABCD* is 52 centimetres.

Work out the length of *DC*.

..... centimetres

(Total for Question 16 is 4 marks)

25



$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

A storage tank exerts a force of 10 000 newtons on the ground.

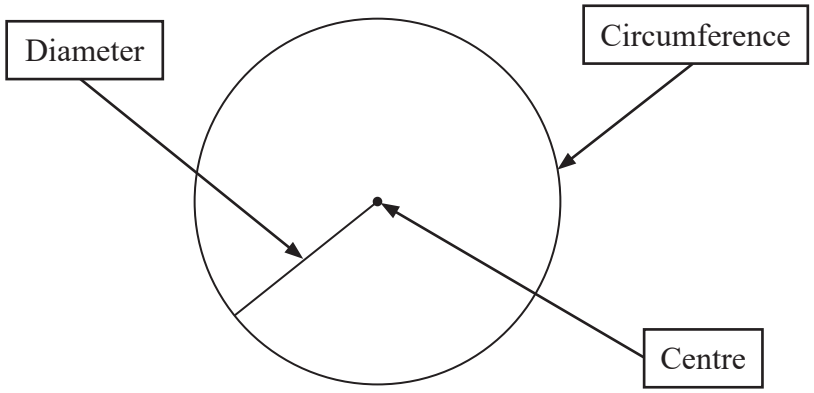
The base of the tank in contact with the ground is a 4 m by 2 m rectangle.

Work out the pressure on the ground due to the tank.

..... newtons / m^2

(Total for Question 25 is 2 marks)

6 Freddie adds labels to this diagram of a circle.



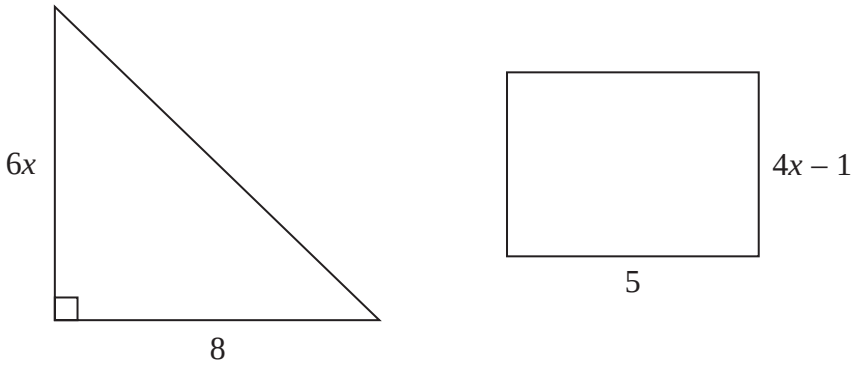
Explain why one of the labels is wrong.

.....

.....

(Total for Question 6 is 1 mark)

24 Here is a triangle and a rectangle.



All measurements are in centimetres.

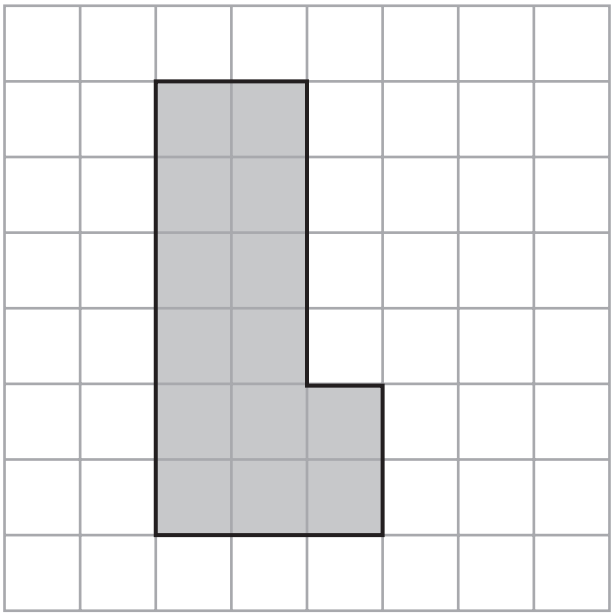
The area of the triangle is $10\,cm^2$ greater than the area of the rectangle.

Work out the value of x.

$x =$ .....

(Total for Question 24 is 4 marks)

6 The diagram shows a shape on a centimetre grid.



(a) Find the area of the shape.

..... cm^2

(1)

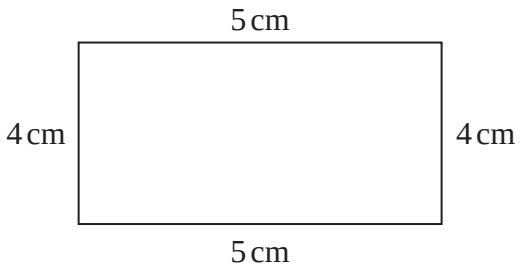
(b) Find the perimeter of the shape.

..... cm

(1)

(Total for Question 6 is 2 marks)

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



He writes,

"The area is 400 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 cm.

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

.....

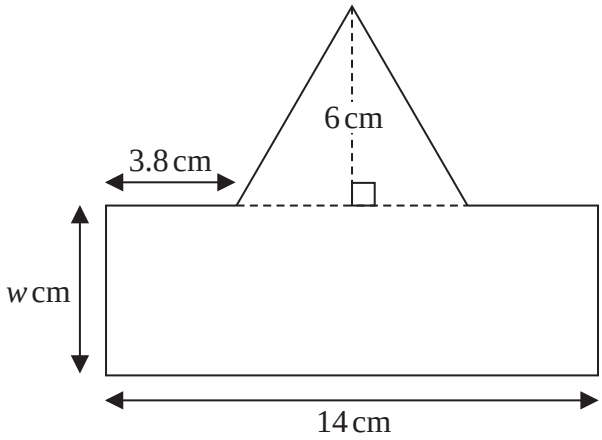
.....

.....

(1)

(Total for Question 13 is 2 marks)

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



The shape has exactly one line of symmetry.

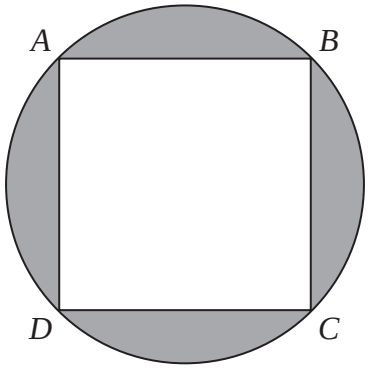
The area of the rectangle is 3.5 times the area of the triangle.
The width of the rectangle is w cm.

Work out the value of w.
You must show all your working.

w = ...

(Total for Question 18 is 5 marks)

29 *A*, *B*, *C* and *D* are points on a circle such that *ABCD* is a square.



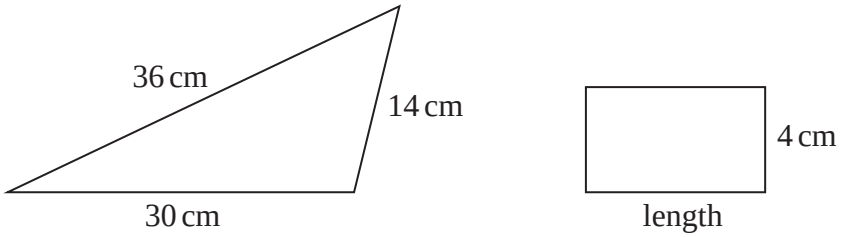
The square *ABCD* has sides of length 3.5 cm.

Calculate the circumference of the circle.
Give your answer correct to 1 decimal place.
You must show all your working.

..... cm

(Total for Question 29 is 4 marks)

12 The diagram shows a triangle and a rectangle.



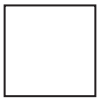
The perimeter of the rectangle is a quarter of the perimeter of the triangle.

Work out the length of the rectangle.

..... cm

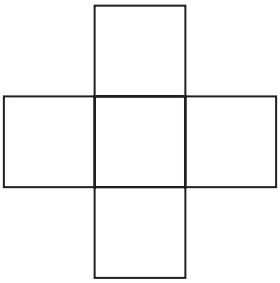
(Total for Question 12 is 4 marks)

10 Here is a square.



The square has a perimeter of 40 cm.

Five of these squares are used to make the shape below.

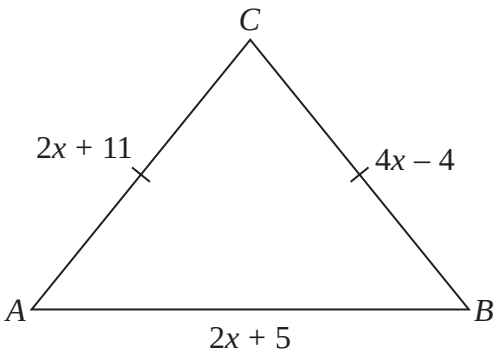


Work out the perimeter of this shape.

..... cm

(Total for Question 10 is 3 marks)

26 The diagram shows triangle *ABC*.



In the diagram, all measurements are in centimetres.

$AC = BC$

The perimeter of the triangle is 72 cm.

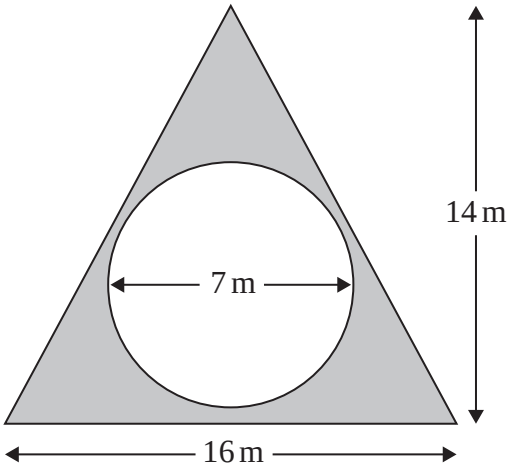
Work out the area of the triangle.

..... cm^2

(Total for Question 26 is 5 marks)

22 Here is a plan of part of Macsen's garden.

There is a circle inside a triangle.
The circle has a diameter of 7 m.



Macsen will cover the shaded area with gravel.

Gravel is sold in bags.
Each bag of gravel covers an area of 12.5 m^2

(a) Work out the number of bags of gravel Macsen will need.

..... bags

(4)

Macsen finds that each bag of gravel only covers an area of $11\,m^2$

(b) How does this affect your answer to part (a)?

.....

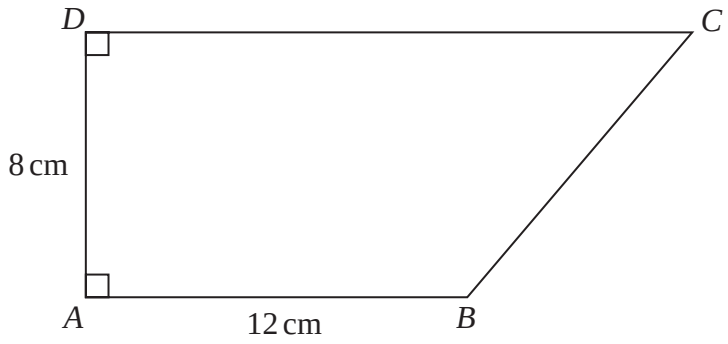
.....

.....

(1)

(Total for Question 22 is 5 marks)

29 The diagram shows trapezium *ABCD*.



AB = 12 cm
AD = 8 cm

The trapezium has an area of 112 cm^2

Work out the perimeter of the trapezium.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 29 is 5 marks)