Planner

Area

- Finding the areas of shapes based on rectangles
- Converting between cm^2 and mm^2
- Finding the area of a triangle
- Estimating the area of complex shapes

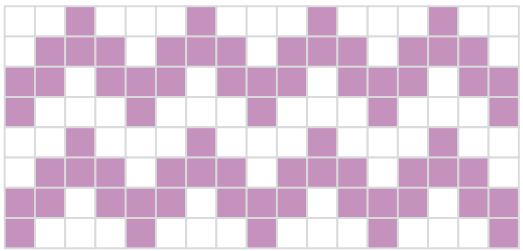
Keywords

You should know

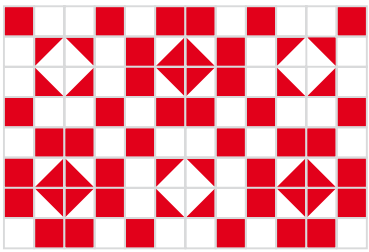
explanation 1

1 Here are some mosaic tile patterns. All of the tiles are squares of this size ■. Work out the number of tiles needed for each pattern.

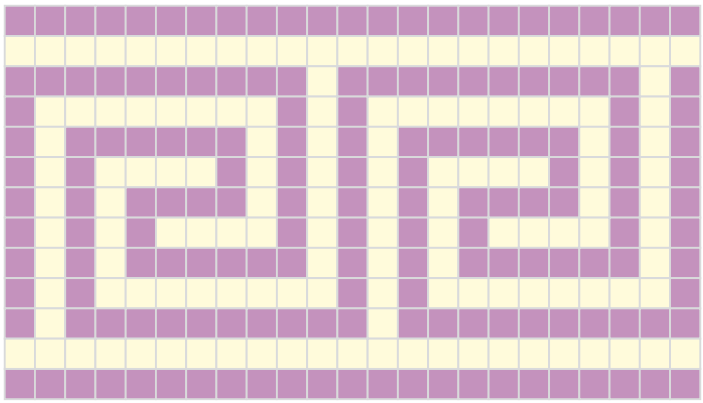
a



b



c



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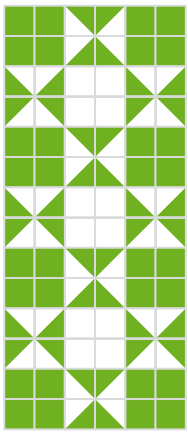
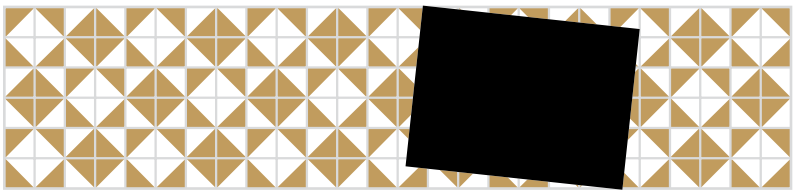
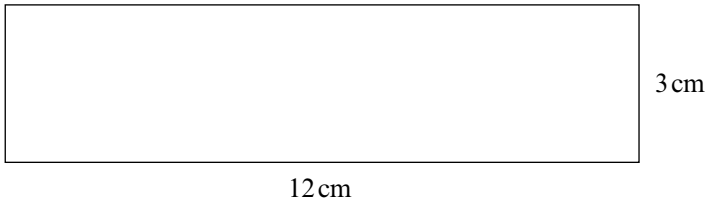


2 This mosaic pattern is partly hidden. How many square tiles does it contain?



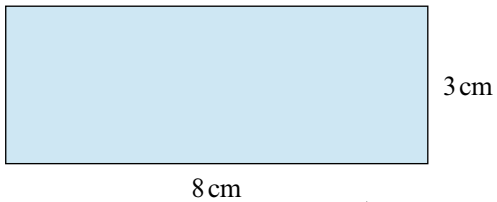
3 How many one centimetre square tiles would fit inside this rectangle?



explanation 2 online

4 Work out the area of each of these rectangles.

a



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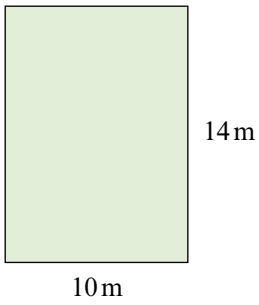

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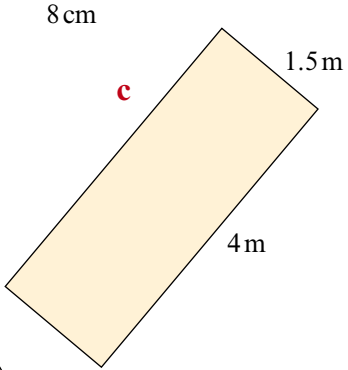

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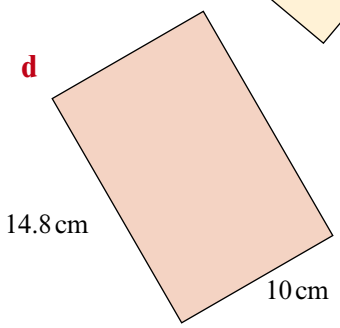

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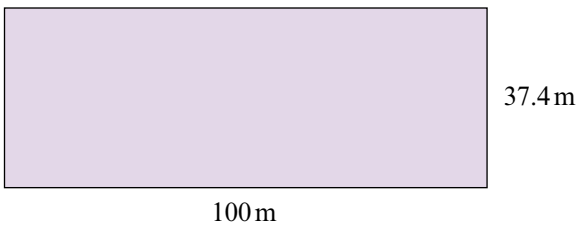
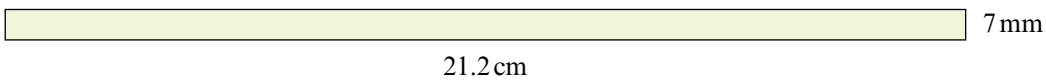


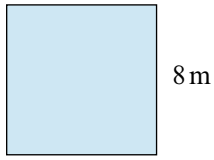
5 Find the area of this rectangle in square millimetres.

Remember
1 cm = 10 mm



6 Find the area of each square.

a



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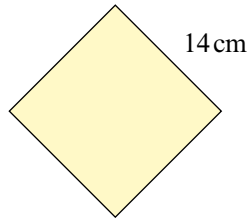

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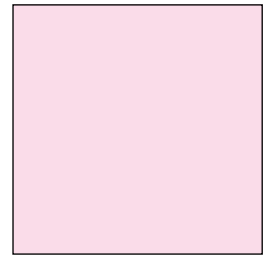
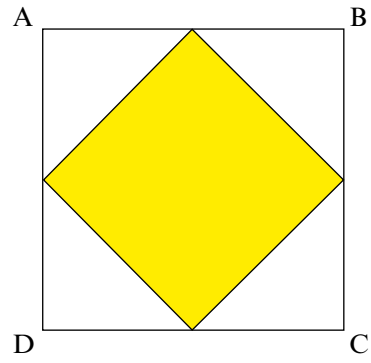


7 **a** Work out the area of a square with perimeter 36 cm.

b Work out the perimeter of a square with area 121 m^2.

8 The diagram shows a square ABCD with a yellow square drawn inside.
ABCD has area 100 cm^2.
Calculate the area of the yellow square and explain how you found your answer.



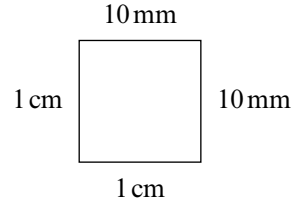
9 **a** Copy and complete the table showing how the area of a rectangle changes, even though its perimeter is fixed at 24 cm.

Length (cm)	Width (cm)	Area (cm^2)
11	1	
10		
9		
8		
7		
6		

b What can you say about the shape when it has the largest area?

c A farmer has 80 m of fence and wants to construct a rectangular enclosure with the largest possible area. What is this area?

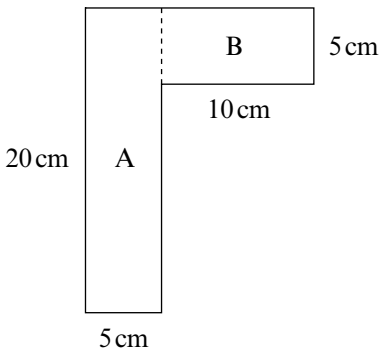
***10** Use the diagram to work out how many square millimetres make 1 cm^2.



explanation 3 online

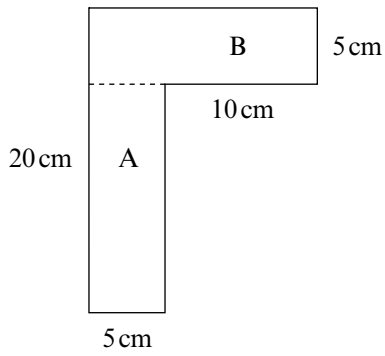
11 Copy and complete these area calculations.

a



Area A = 5 cm × 20 cm = ☐
Area B = ☐ × ☐ = ☐
Total area = ☐

b

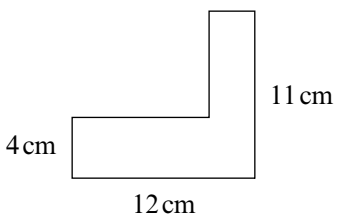


Area A = 5 cm × 15 cm = ☐
Area B = ☐ × ☐ = ☐
Total area = ☐

12 What does question **11** show about calculating the total area of a shape?

13 Work out the area of each of these shapes.

a



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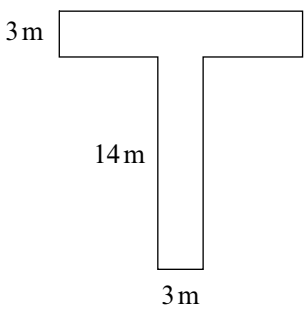
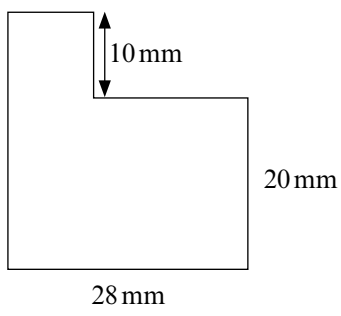


c



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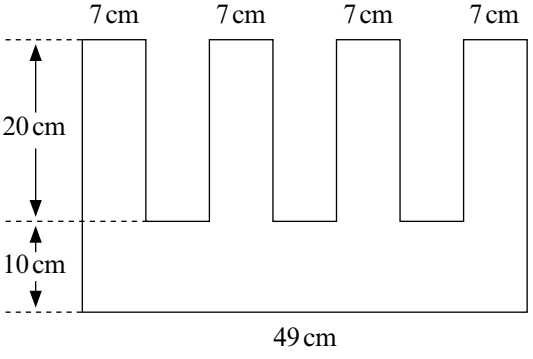

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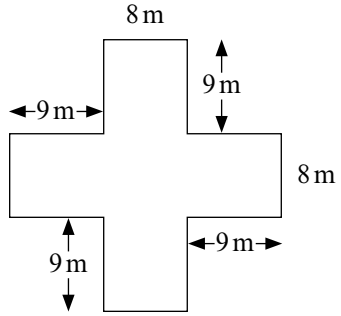
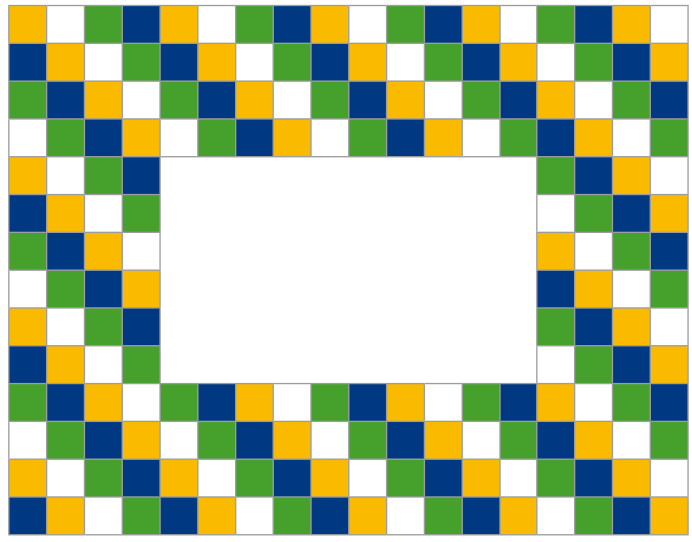


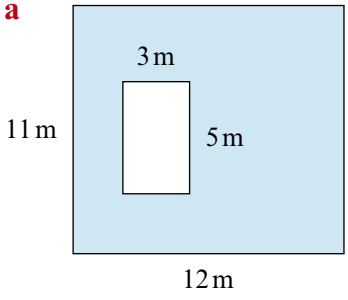
explanation 4

14 This mosaic pattern includes an area where there are no tiles.
How many tiles are used in the pattern?



15 Work out the coloured areas of these diagrams.

a



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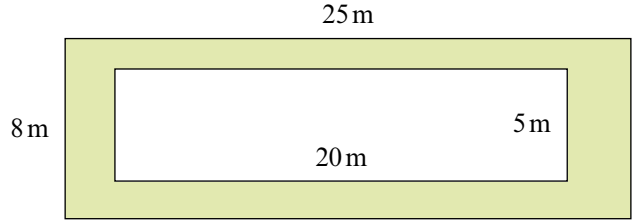
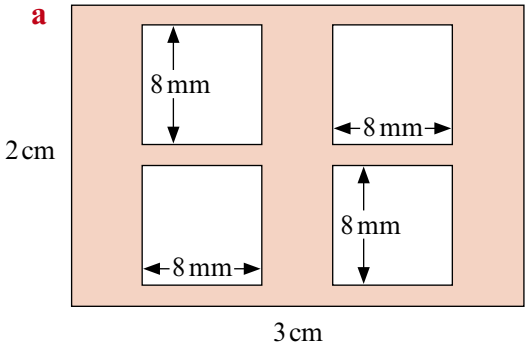


16 Calculate the coloured areas of these diagrams in square millimetres.

a



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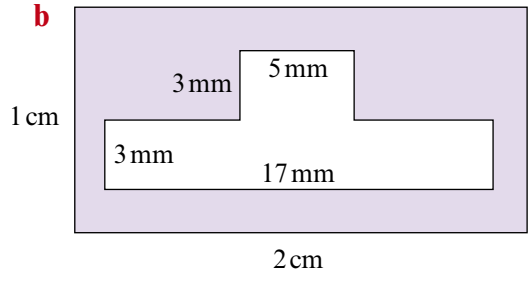
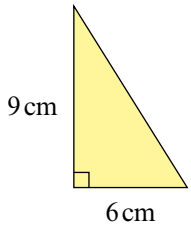


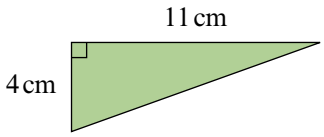
explanation 5 online

17 Find the area of each triangle.

a



b



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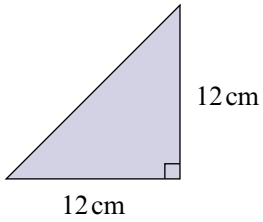

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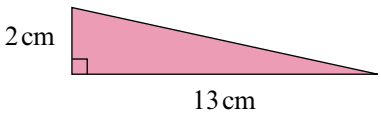

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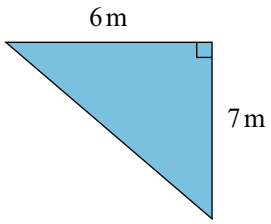

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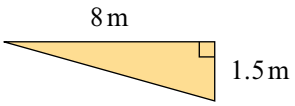
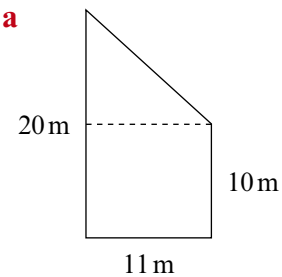


18 Work out the areas of these shapes.

a



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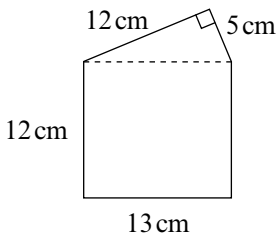

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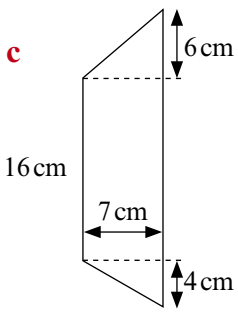
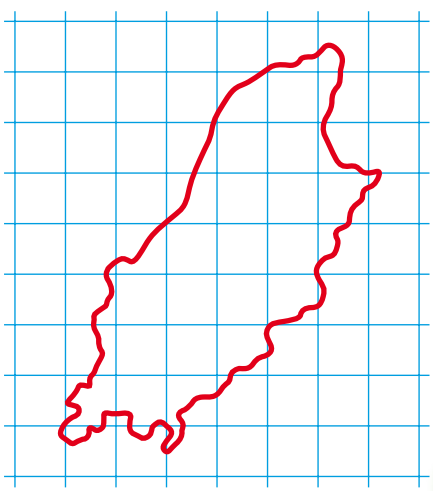


explanation 6 online

19 The diagram shows an outline map of the Isle of Man on a square grid. Each square of the grid has an area of 25 km^2.

Use the grid to estimate the area of the Isle of Man.



20 Diagram 1 shows a map of Loch Ness with a rectangle drawn around it.

a Use the diagram to estimate the area of the loch.

b Do you think that your estimate is more or less than the true area? Explain.

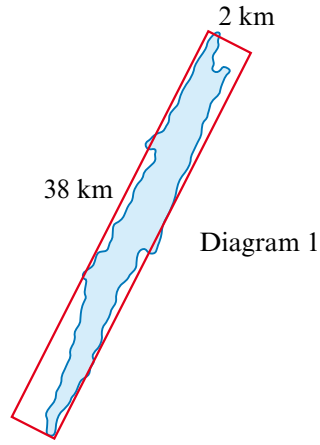


Diagram 1

c Diagram 2 shows the loch again, but with some extra rectangles and triangles marked.
Removing these areas from the area of the large rectangle will give you an improved estimate of the area of the loch.

i Copy and complete the table.

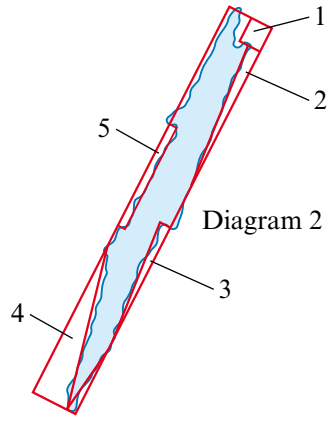


Diagram 2

Number	Shape	Base (km)	Height (km)	Area (km^2)
1	Rectangle	1	1.5	
2	Triangle	0.5	12	
3	Triangle	0.5	10	
4	Triangle	1.5	12	
5	Rectangle	8	0.5	
			Total	

ii What is your improved estimate of the area of Loch Ness?