



Using Grids to Find Area

Work out the area and the perimeter of each shape shown below. Fill your results in the table.

	1.	2.	3.	4.
	5.	6.		7.
	8.	9.		
10.				
		11.		

Area (cm ²)	Perimeter (cm)
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	



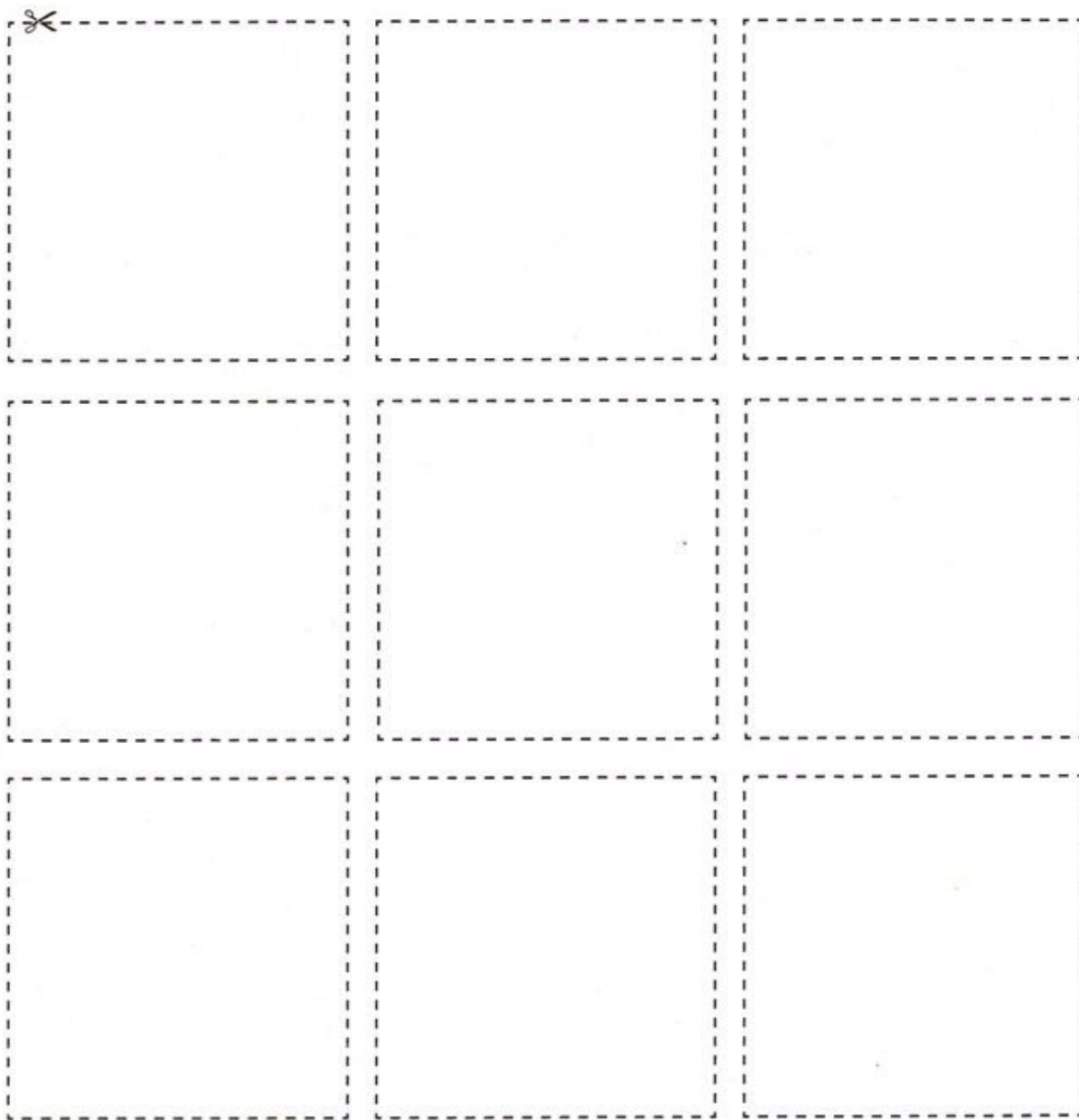
Same Area with Different Perimeters

Cut out the 9 squares below. See if you can make the following shapes with them.

1. A shape with an area of 9 units and a perimeter of 12 sides.
2. A shape with an area of 9 units and a perimeter of 14 sides.
3. A shape with an area of 9 units and a perimeter of 16 sides.
4. A shape with an area of 9 units and a perimeter of 20 sides.
5. A shape with an area of 9 units and a perimeter of 22 sides.
6. A shape with an area of 9 units and a perimeter of 36 sides.

Discussion

How is it possible that the same area can produce a wide range of perimeters?



2. DESIGN A NEW BEDROOM

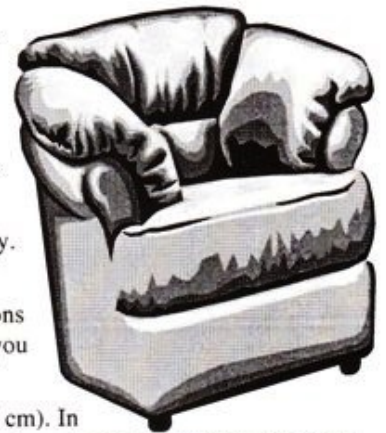
Write answers on a separate piece of paper attached to your scale drawings.

- You have to design the floor plan of your new bedroom using a scale drawing. The area must be 12 square metres.
- You must draw **two** different floor plans.
- Each floor plan must have the furniture glued to it (see table below).
- Each floor plan must be drawn using grid paper provided with the scale 1 cm = 25 cm.
- Mark the positions of the windows and door in your plan. Remember you are looking on your plan from above. You cannot draw a full window or door. Indicate them by a narrow rectangle or double lines. Show the way the door swings open with a small line that represents the width of the door.
- Use the scale measurements for each piece of furniture and make paper models of them.



Furniture	Measurements
Bed	(you decide)
Desk and Chair	70 cm by 1 m
Bedside Table	60 cm by 40 cm
Chest of Drawers	60 cm by 120 cm
Shelves	40 cm by 1 m
Wardrobe	60 cm by 2 m

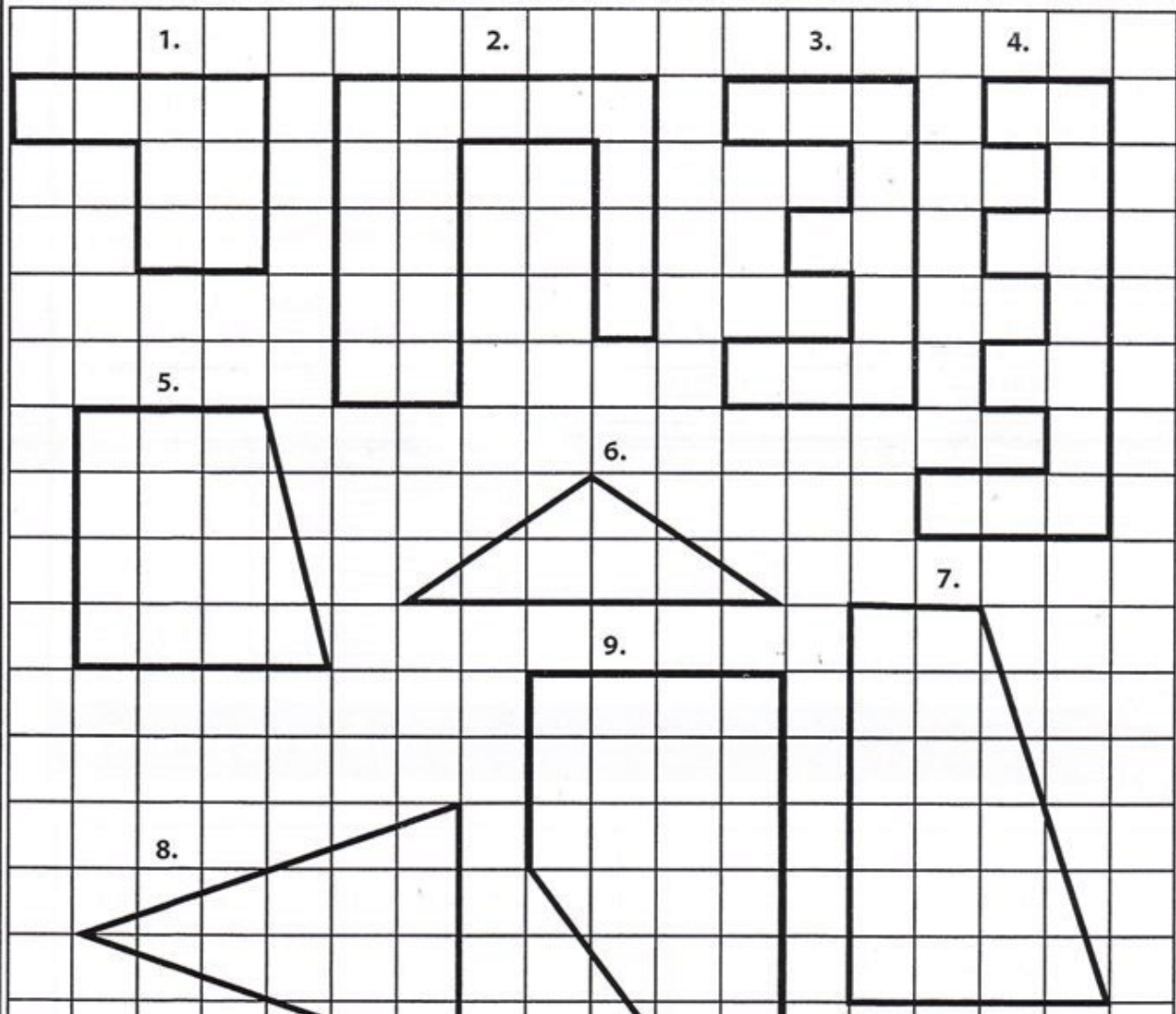
- Arrange the pieces of furniture on your floor plan until you are happy with the layout of your room, then glue and label the pieces in their positions.
- Compare your two plans by answering these questions:
 1. Calculate the ratio of perimeter to area for your two floor plans. Which ratio will give you more choices for where you can place your furniture in the room?
 2. Suppose two friends share the room with you during an overnight stay. Explain which floor plan would work better for this.
 3. You get a new desk for the computer you got on your birthday (dimensions 75 cm by 1 m). In which floor plan would this fit better? Indicate where you would put it in both plans by using red dotted lines to show its size.
 4. What if you want to put in a stereo in your bedroom (dimensions 50 cm by 50 cm). In which plan would this fit better? Indicate where you would put it in both plans by using blue dotted lines to show its size.
 5. Which plan do you like better? You must say why you prefer this plan to the other one.





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Work out the area and the perimeter of each shape shown below. Fill your results in the table.



	Area (cm ²)	Perimeter (cm)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Area & Perimeter 1



Fill in the table below. The data is for a square that keeps doubling in length.

	1	2	4	8	16
	1 <input type="text"/>	2 <input type="text"/>	4 <input type="text"/>	8 <input type="text"/>	16 <input type="text"/>
Length	1	2	4	8	16
Perimeter					
Area					

As the length doubles the perimeter is _____ times its previous value.

As the length doubles the area is _____ times its previous value.

Area & Perimeter 2



Fill in the table below for a rectangle that keeps doubling its dimensions.

	2	4	8	16	32
	1 <input type="text"/>	2 <input type="text"/>	4 <input type="text"/>	8 <input type="text"/>	16 <input type="text"/>
Length	1	2	4	8	16
Perimeter					
Area					

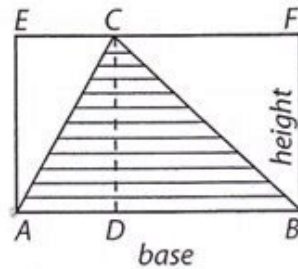
As the length doubles the perimeter is _____ times its previous value.

As the length doubles the area is _____ times its previous value.

Area of Triangles



info



$$\text{Area } ECA = \text{Area } ACD$$

$$\text{Area } CDB = \text{Area } CFB$$

So: The area of a triangle is half the area of the rectangle.

Area of the rectangle = base \times height

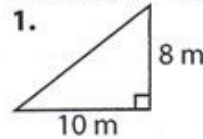
Area of the triangle must be $\frac{\text{base} \times \text{height}}{2}$

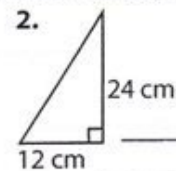
The height must be the perpendicular height above the base.

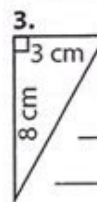
General Rule

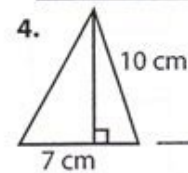
Area of a triangle = $\frac{\text{base} \times \text{perpendicular height}}{2}$

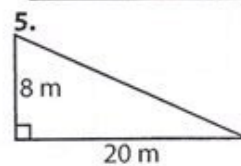
Work out the areas of the triangles below.

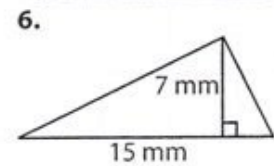












TilesResources required:

a calculator per student.



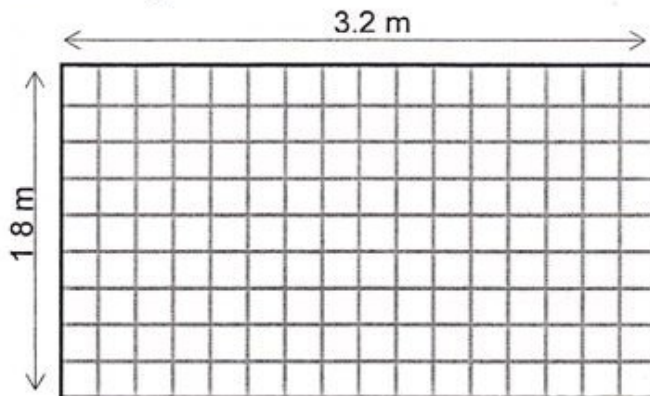
These men are laying vinyl tiles.

Cork or vinyl tiles are typically
 200mm x 200mm
 300mm x 300mm
 or 330mm x 330mm.

You want to tile a floor that is 3.2m x 1.8m.

Your tiles are 200mm square. What is 200mm in metres?

To work out the number of tiles you need, you could draw them in a scale diagram like the one below.



How do you work out the number of tiles needed in each dimension?

.....

From this diagram, the total number of tiles needed

= x

=

There is another way of working out the number of tiles needed.

Area to be tiled =m². Area covered by one tile =m².

Now use these two areas to work out the how many tiles are needed.

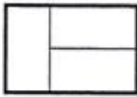
Does your answer agree with your answer from the diagram?

Use division of areas to calculate how many tiles you would need if the tiles were 300mm square.

For a good job (using the fewest pieces of cut tile), you need more 300mm square tiles than the number calculated above. How many are needed?

Paving bricksResources required:

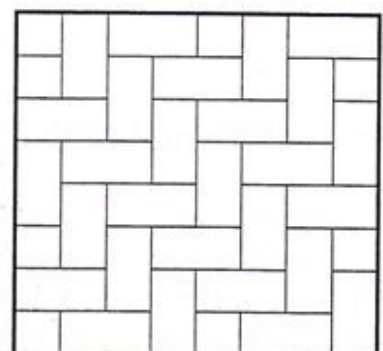
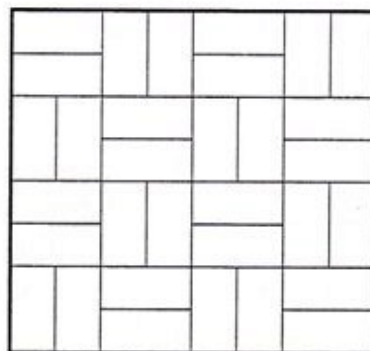
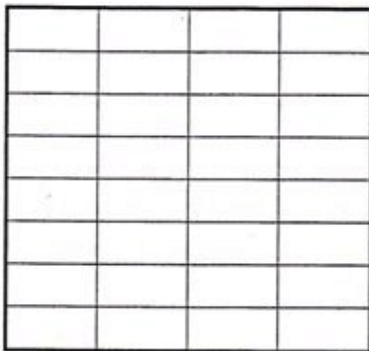
a calculator per student.



This is a drawing of 3 congruent paving bricks.
How do you know that the length of each brick is twice
its width?

.....

These bricks are useful for paving because they can be tessellated in
many different ways.



How many bricks are in the first arrangement?

How many bricks are in each of the other two arrangements?

How could you tell without counting them?

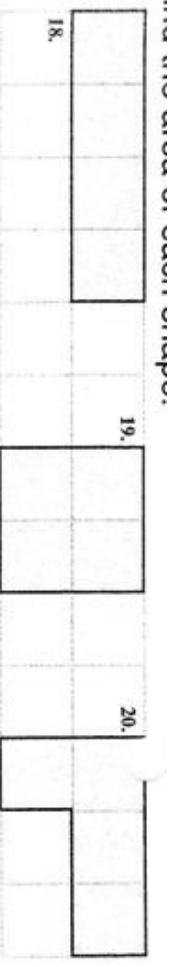
.....

The area covered by each arrangement is 0.48m^2 .

What is this area in square centimetres?

What is the area covered by each brick?

If you wanted to pave an area $3.6\text{m} \times 4.5\text{m}$, how many bricks would you
need?



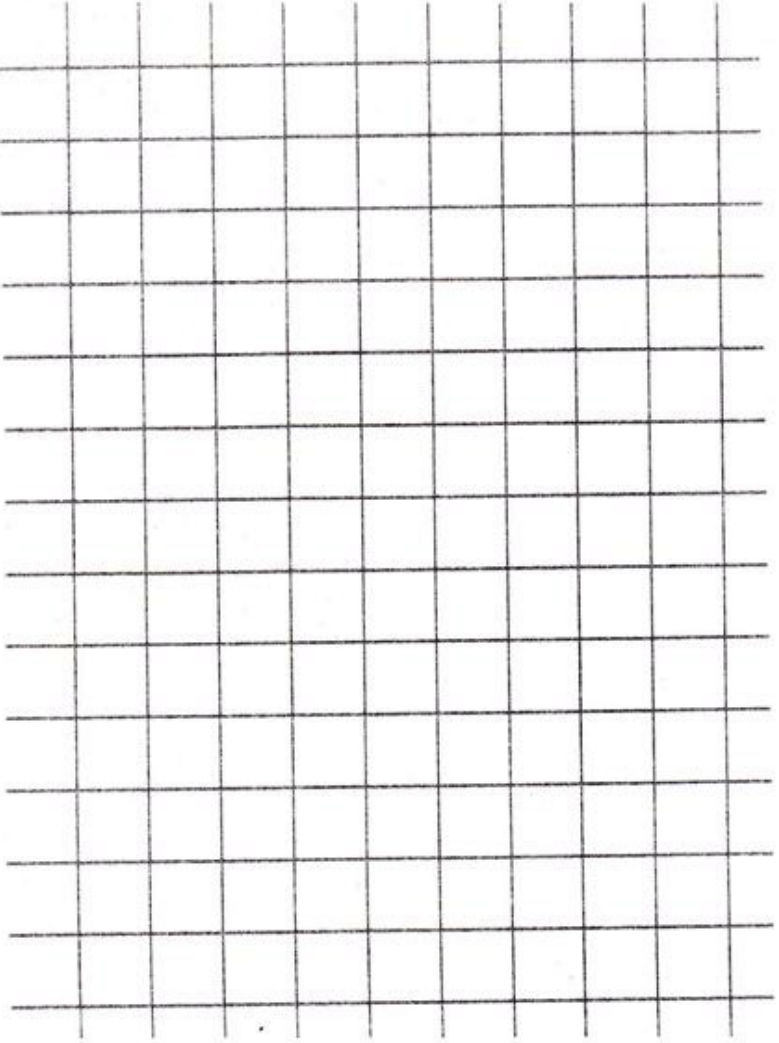
Choose the best unit for measuring the following things.

- 21. house floors
- 22. bankcard
- 23. chalkboard
- 24. pinhead
- 25. school grounds
- 26. area of NSW
- 27. classroom wall
- 28. area of Australia
- 29. a farm
- 30. a 5c coin

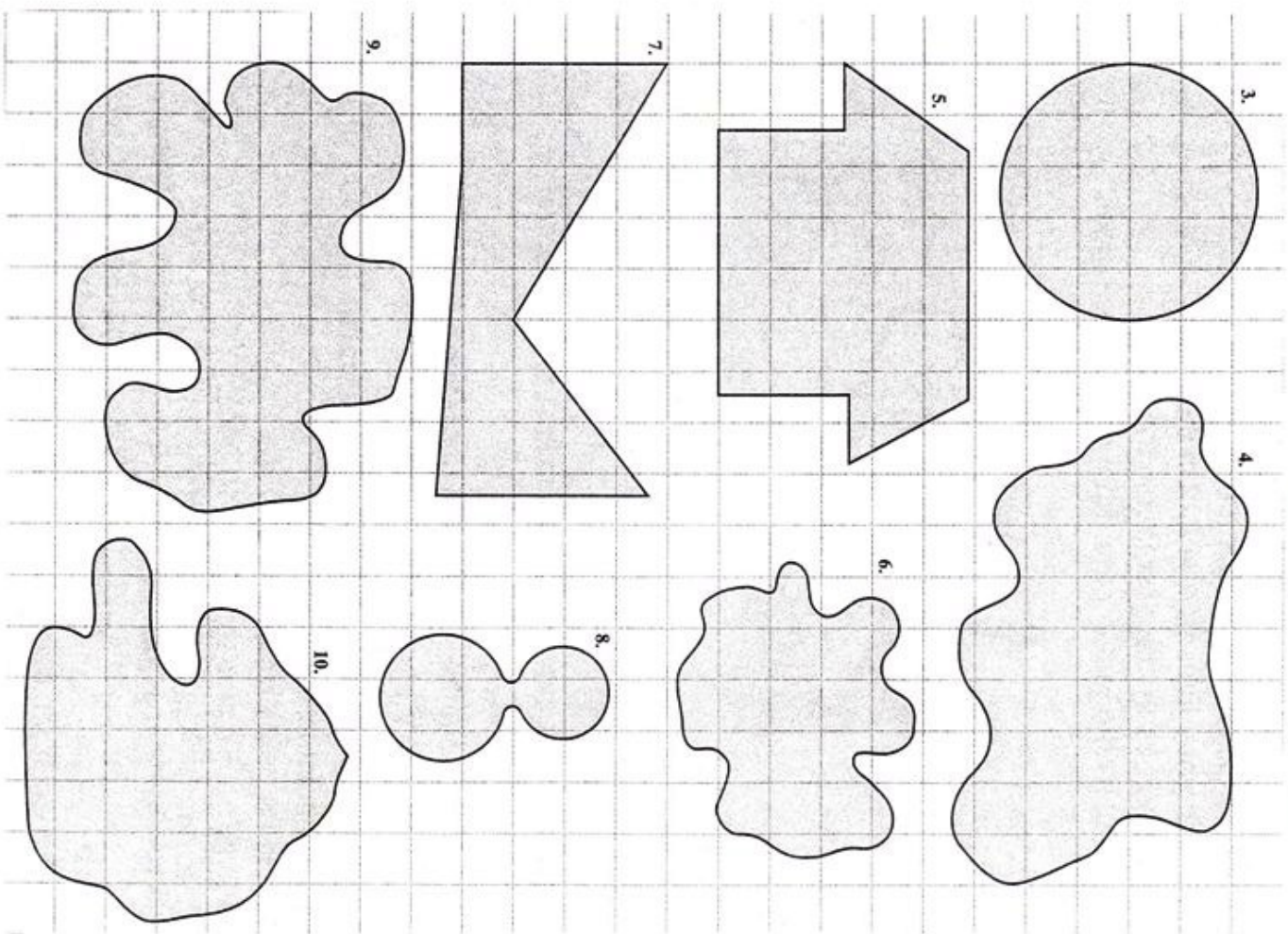
Measurements			
mm ²	cm ²	m ²	
hectares		km ²	

INVESTIGATION: Activity

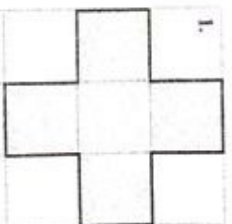
Use 1 cm grid paper to draw three different shapes each of area 9 cm².



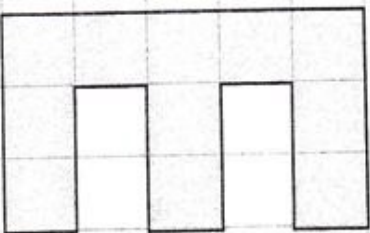
Estimate the areas below by counting squares.



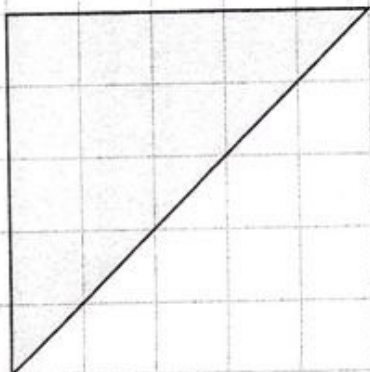
Find the area of each shape in square units.
You might need to count half squares.



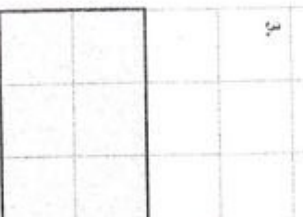
2.



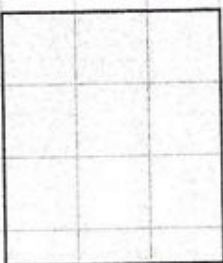
4.



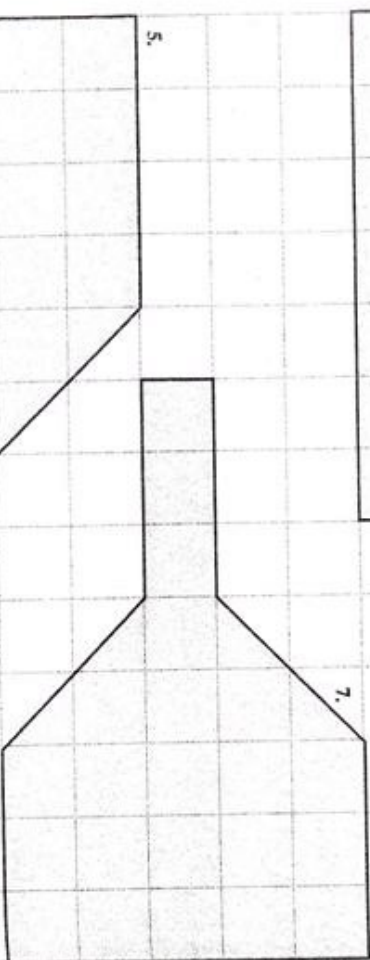
3.



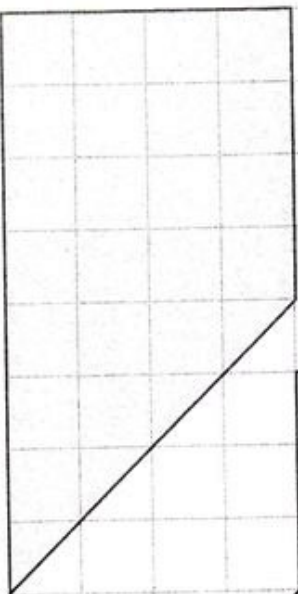
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5.



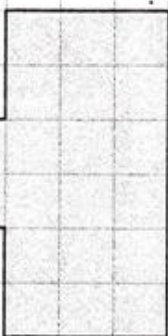
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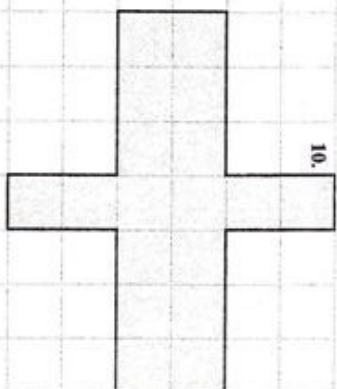
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11.



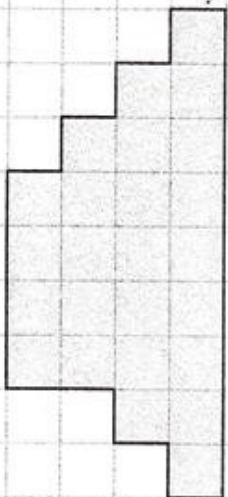
10.



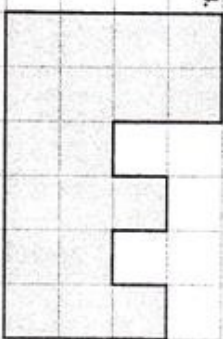
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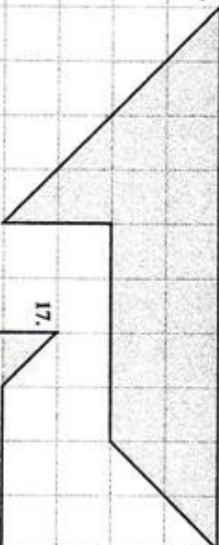
13.



14.



15.



17.



16.

