Planner

Solving geometrical problems

- Applying your knowledge to solve problems

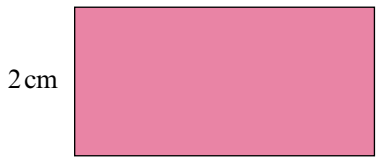
Keywords

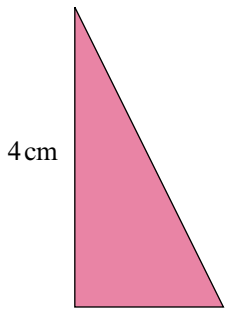
You should know

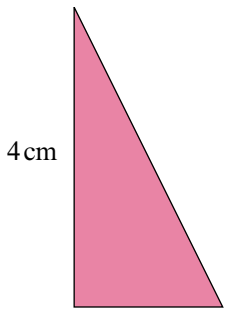
explanation 1

online

1 You have this rectangle and these two right-angled triangles.







You can translate, rotate or reflect any of the shapes and combine them to build new shapes.

Draw diagrams to show how to build these shapes.

a A square

b Two different parallelograms

c Two different trapeziums

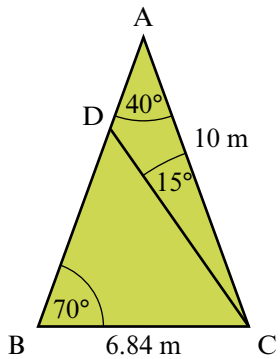
d Two different isosceles triangles

e A pentagon

2 **a** Show that this diagram contains two isosceles triangles.

b Calculate the distance AD.

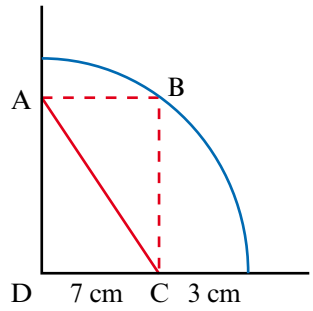
Explain your method.



3 In this diagram, ABCD is a rectangle.

The blue arc is a quarter of a circle with centre at D.

Find the length of AC and explain your reasoning.

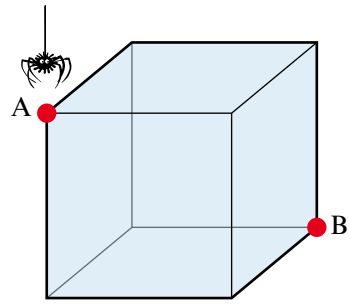


4 A spider is about to walk from A to B on the surface of the cube. Each side of the cube is 5 cm long.

a The spider takes the shortest path from A to B.

How long is this path to the nearest 0.1 cm?

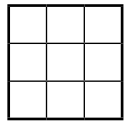
b How many different paths are there between A and B that have this length?

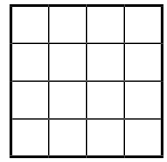


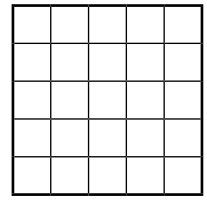
5 **a** Find the number of squares in each of these diagrams.

Count squares of different sizes and look for a pattern.

i 

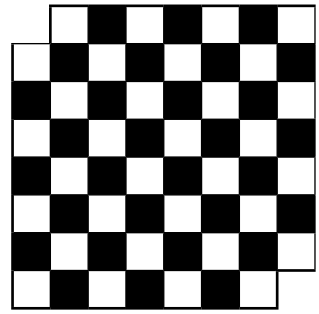
ii 

iii 

iv 

b How many squares are there on a chessboard?

6 This diagram shows a chessboard pattern with a pair of opposite corners removed.



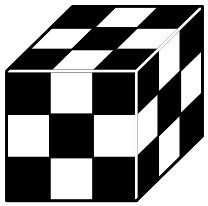
You are given 31 domino-shaped tiles like this one shown here. 

Each tile will exactly cover two squares of the chessboard.

Is it possible to place the tiles on the chessboard pattern so that it is completely covered?

- If it can be done, draw a diagram to show how.
- If it is impossible, ecplain why.

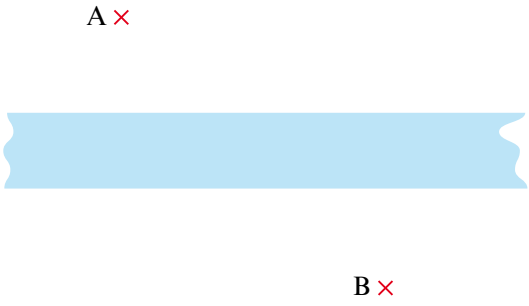
7 The diagram shows a cube made from 27 smaller cubes that have been stuck together. Individual cubes are easily removed.



- Choose any outside cube as a starting point and remove it.
- Now choose a cube that was next to the one removed. Remove it.
- Continue in this way until there is just one cube left.

Is it possible to do this so that the last cube is the one in the centre?

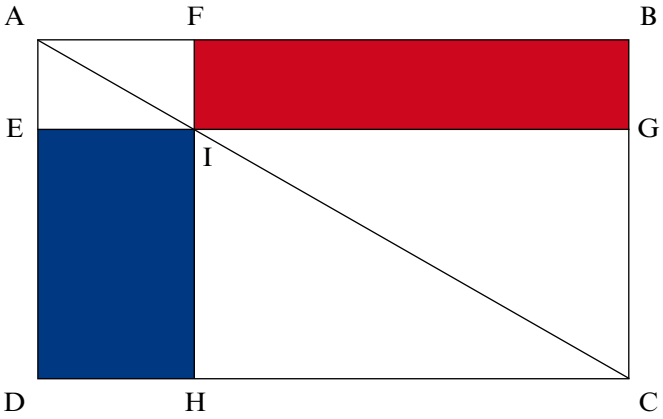
8 This diagram represents two towns A and B with a canal running between them.



A bridge is to be built across the canal at right angles to the banks so that the road needed to link the two towns is as short as possible.

Copy the diagram and show the best position for the bridge. Explain your reasoning.

9 This diagram shows a large rectangle with red and blue rectangles drawn inside.



Which of these statements is true?

- The blue area is greater than the red area.
- The red area is greater than the blue area.
- The blue and red areas are equal.

Explain your reasoning.