



Visualising 3-D shapes

- Describing a 3-D shape using a plan, front elevation and side elevation
- Visualising a 3-D shape given its plan, front elevation and side elevation
- Visualising planes of symmetry

Keywords

You should know

explanation 1a

explanation 1b

explanation 1c

- 1** A teacher holds a solid shape in front of the projector and it casts a shadow on the whiteboard. Describe the possible solids that the teacher could be holding.

a



b



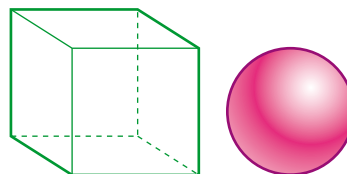
c



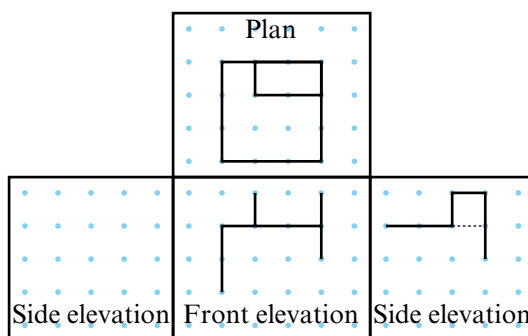
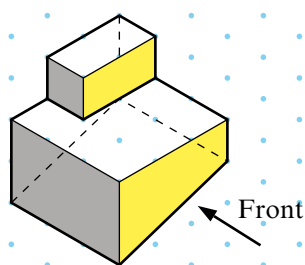
d



- 2** What is the radius of the biggest sphere that will fit inside a cube with sides 5 cm?



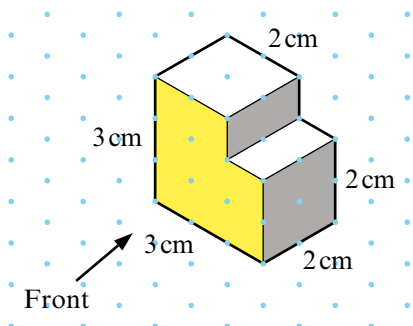
- 3** Sam has drawn the plan of a shape. She has started to draw the front elevation and one of the side elevations.



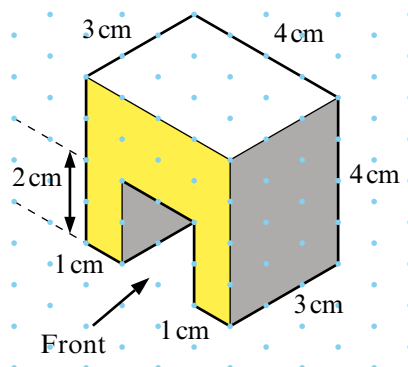
- a** What does the dashed line in the right-hand side elevation mean?
- b** Copy and complete Sam's drawings.
- c** Explain why Sam has set out the plan and elevations in this way.

4 Describe each solid by drawing a plan, front elevation and side elevations. Set your drawing out like Sam's in question 3.

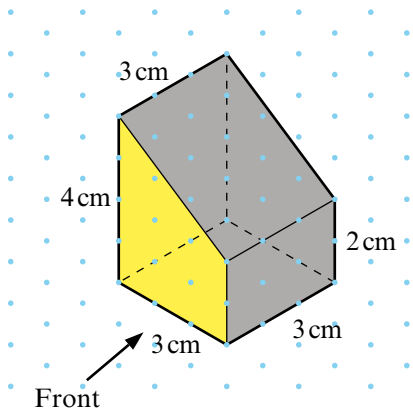
a



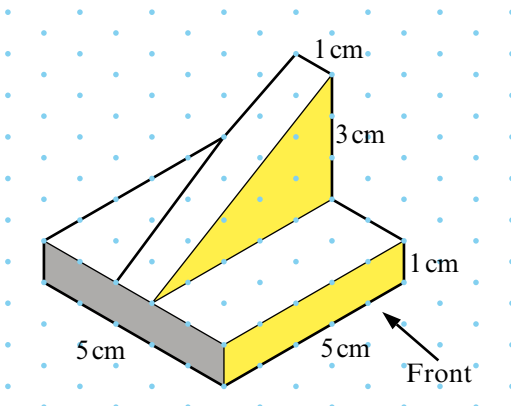
b



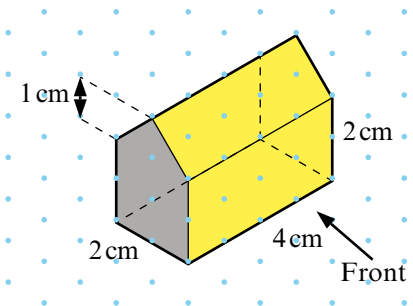
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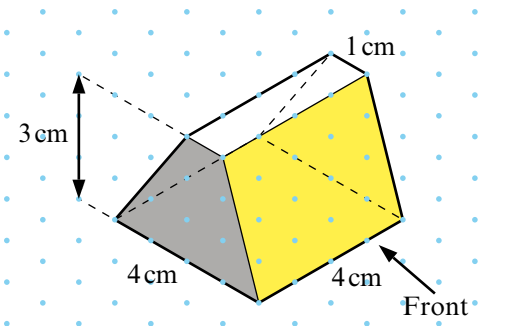
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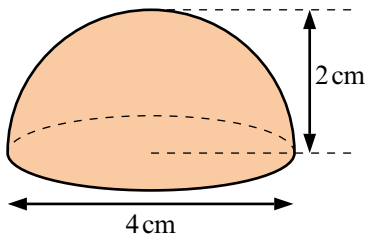
e



f



5 The diagram shows a solid shape.

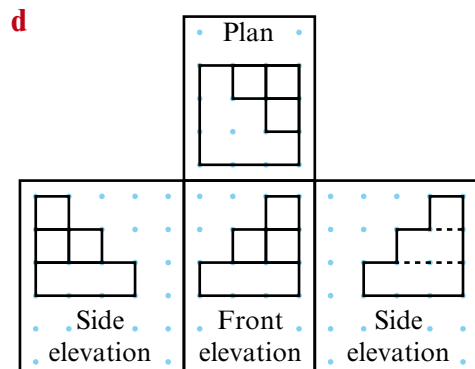
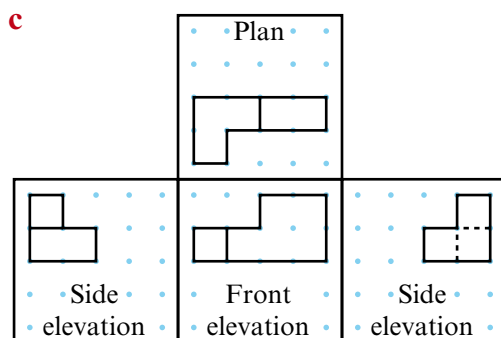
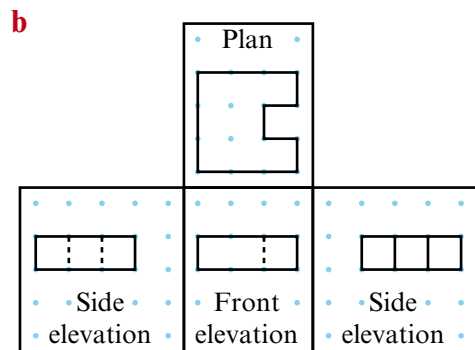
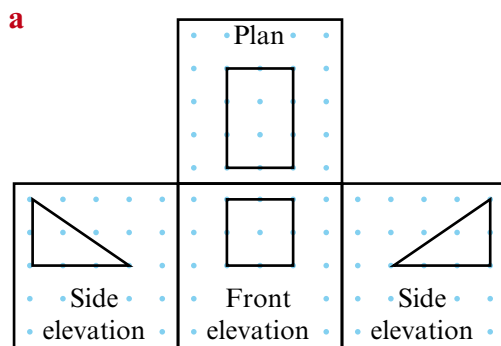


- What is this solid called?
- Describe this solid by drawing a plan, front elevation and side elevations.
- On these drawings, draw the longest cylinder with radius 1 cm that could fit inside this solid. Measure its length.

explanation 2a

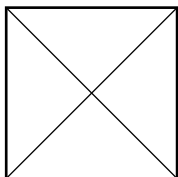
explanation 2b

6 Look at the plan, front elevation and side elevations for these 3-D shapes. Draw each 3-D shape on isometric dotted paper.

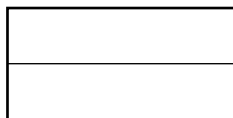


- 7** Megan has drawn the plan of some familiar solids. Sketch and name the solid in each case.

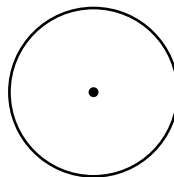
a



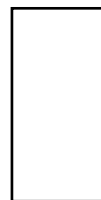
b



c



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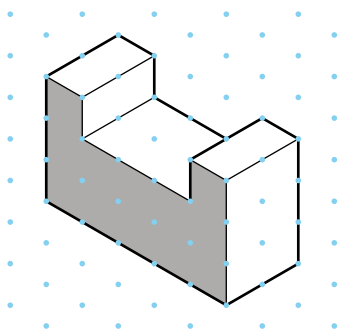


explanation 3a

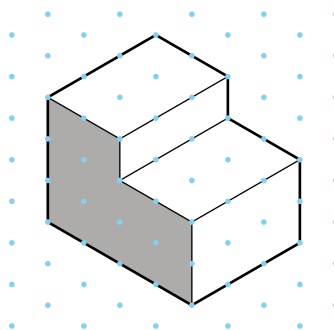
explanation 3b

- 8** How many planes of symmetry does each solid have?

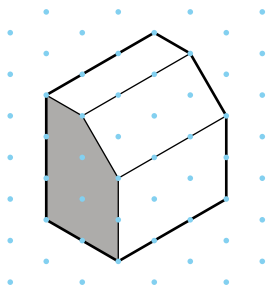
a



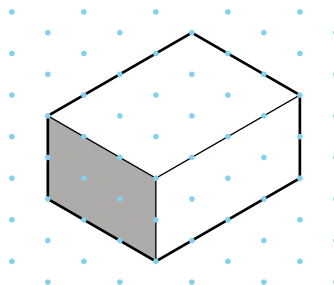
b



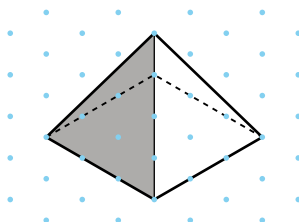
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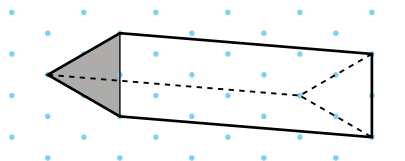
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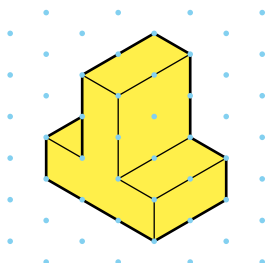


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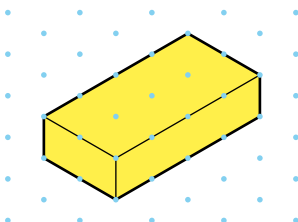


- 9** Clive works at a delicatessen and makes some 3-dimensional shapes out of yellow cheese. On isometric paper, draw all the possible planes of symmetry for each solid.

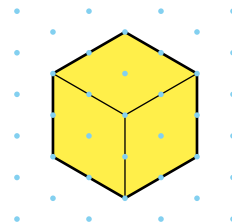
a



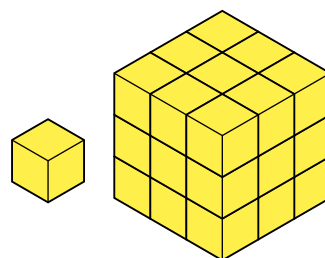
b



c



- 10** Jane has 28 small cubes. She uses 27 of them to make a big cube with side 3 cm. This big cube has 9 planes of symmetry.



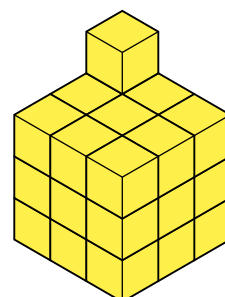
- a** Jane places the extra cube on top of one of the corner cubes as shown in this diagram.

How many planes of symmetry does the solid have now?

- b** Jane moves the extra cube to the top of the middle cube.

i Draw a plan view and front elevation.

ii How many planes of symmetry does this solid have?



- 11** You need isometric paper for this question.

- a** Draw a 3-dimensional shape that has only one plane of symmetry.
b Draw a 3-dimensional shape that has only four planes of symmetry.
c Draw a 3-dimensional shape that has an infinite number of planes of symmetry.