# Plans, Elevations and Loci

GCSE Mathematics • **Foundation Tier** • Grades 4–6 • Non-calculator

**WORKED SOLUTIONS**

Name: _____ worked example _____ Class: _____ Total: ___ 52 ___ / 52

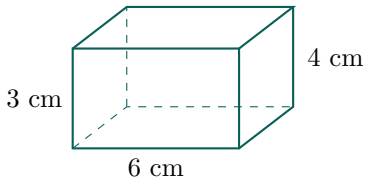
*Show all your working. Marks are given for correct method as well as the final answer.*

**1.** Write down what the PLAN of a solid shows. **[1 mark]**

looking straight down

**Answer:** ____ the view from directly above ____

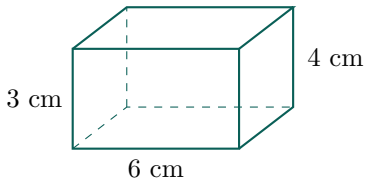
**2.** Sketch the plan of this cuboid. **[2 marks]**




from above you see the length and the width
the height does not appear in the plan

**Answer:** ____ a 6 cm by 4 cm rectangle ____

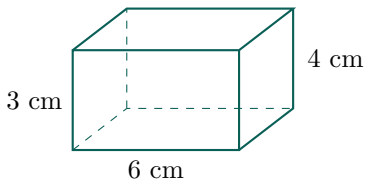
**3.** Sketch the front elevation of the same cuboid. **[2 marks]**




from the front you see the length and the height

**Answer:** ____ a 6 cm by 3 cm rectangle ____

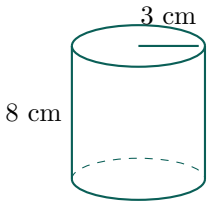
**4.** Sketch the side elevation of the same cuboid. **[2 marks]**




from the side you see the width and the height

**Answer:** ____ a 4 cm by 3 cm rectangle ____

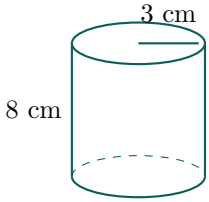
**5.** Sketch the plan of this cylinder. **[2 marks]**




*from above a cylinder is a circle*

**Answer:** ____ *a circle of radius 3 cm* ____

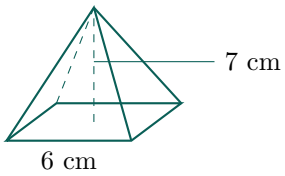
**6.** Sketch the front elevation of the same cylinder. **[2 marks]**




*from the front it is a rectangle*
*width is the DIAMETER, 6 cm*

**Answer:** ____ *a 6 cm by 8 cm rectangle* ____

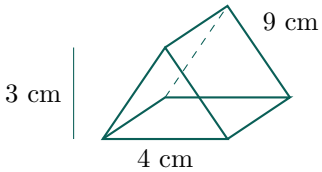
**7.** Sketch the plan of this square-based pyramid. **[3 marks]**




*the base square, with the edges to the apex*
*showing as the two diagonals*

**Answer:** ____ *a square with its diagonals* ____

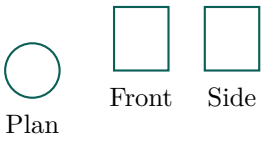
**8.** Sketch the front elevation of this triangular prism. **[2 marks]**




*the cross-section faces the front*

**Answer:** ____ *a triangle, base 4 cm, height 3 cm* ____

**9.** These are the three views of a solid. Name the solid. **[2 marks]**




*circular plan, rectangular elevations*

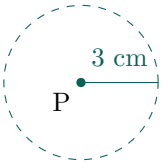
**Answer:** _____ *a cylinder* _____

**10.** Explain why a plan and a front elevation together are not always enough to identify a solid. **[2 marks]**

*that is why THREE views are drawn*

**Answer:** ____ *different solids can share two views* ____

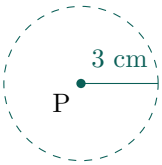
**11.** Describe the locus of points exactly 3 cm from a fixed point $P$. **[2 marks]**




*every point the same distance from one point*

**Answer:** ____ *a circle of radius 3 cm, centre P* ____

**12.** Describe the locus of points LESS than 3 cm from $P$. **[2 marks]**




*the region, not the edge*
*draw the boundary dashed when it is excluded*

**Answer:** ____ *the inside of that circle* ____

**13.** Describe the locus of points equidistant from two fixed points $A$ and $B$. **[2 marks]**




*the line at right angles through the midpoint*

**Answer:** ____ *the perpendicular bisector of AB* ____

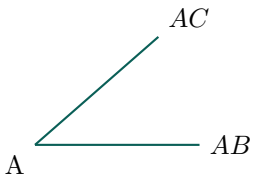
**14.** Describe how to construct that perpendicular bisector. **[3 marks]**




compasses set to more than half of AB
arc from A, arc from B, above and below
join the two crossing points
leave your construction arcs showing

**Answer:** ____ equal arcs from A and B, join the crossings____

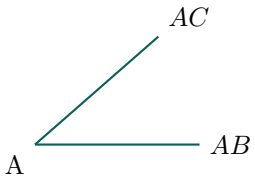
**15.** Describe the locus of points equidistant from two lines $AB$ and $AC$. **[2 marks]**




the line that cuts the angle in half

**Answer:** ____ the bisector of angle BAC____

**16.** Describe how to construct that angle bisector. **[3 marks]**




arc from A cutting both lines
equal arcs from those two points
join A to where they cross

**Answer:** ____ arc from A, then equal arcs from the crossings____

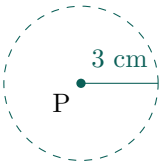
**17.** Describe the locus of points exactly 2 cm from a straight line segment $AB$. **[3 marks]**




2 cm each side of the line
the ENDS curve round in semicircles

**Answer:** ____ two parallel lines with semicircular ends____

**18.** A goat is tied by a 4 m rope to a post in an open field.




**(a)** Describe the region the goat can reach. **[2 marks]**

a circle of radius 4 m, centre the post

**(b)** Work out the area, to 1 d.p. **[3 marks]**

$\pi \times 4^2$
$= 50.26...$
$= 50.3\ m^2$

**Answer:** a circle of radius 4 m ; $50.3\ m^2$

**19.** A treasure is less than 5 m from a tree $T$ AND nearer to fence $A$ than fence $B$.

**(a)** Describe the two loci involved. **[3 marks]**

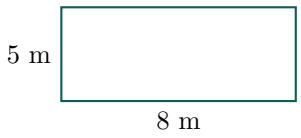
inside a circle of radius 5 m, centre T
on A's side of the perpendicular bisector of AB

**(b)** Explain how to shade the region where it could be. **[2 marks]**

shade only where BOTH conditions hold
the overlap, not either one alone

**Answer:** circle and perpendicular bisector ; shade the overlap

**20.** A rectangular garden is 8 m by 5 m. A path runs exactly 1 m from the fence, all the way round, inside the garden.




**(a)** Describe the locus of the path. **[2 marks]**

a smaller rectangle, 1 m in from each side
6 m by 3 m

**(b)** Work out the length of that path. **[3 marks]**

perimeter of the inner rectangle
$2(6 + 3)$
$= 18$ m

**Answer:** a 6 m by 3 m rectangle ; 18 m

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