

UNIT 12 *Solids*

Introduction to SIM

Learning objectives

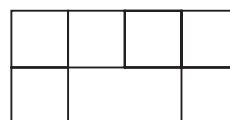
The work in this unit is focused on the important practical topic of solids (sometimes referred to as 3D, that is, three-dimensional, shapes). After completing this unit of STUDENT INSTRUCTIONAL MATERIAL (SIM) you should be able to

- use a 2D net to construct a 3D shape
- name the common 3D shapes
- design a net for a given 3D shape
- determine the plan and elevations (front and side) for a given 3D shape
- use isometric paper to illustrate 3D shapes.

Key points and principles

- There are many ways that nets can be constructed for the same solid.
- A plan and two elevations (front and back) provide a way of defining a 3D shape (solid).
- A box is a cuboid, but a cuboid is a cube only when all its sides are square.
- You need a net of 6 identical squares to make the net of a cube, but not all nets of 6 identical squares will make a cube.

For example, the net shown here will not make a cube.

***Facts to remember***

- Names of common 3D shapes.
For example: sphere, cube, cuboid, cylinder, pyramid, prism, tetrahedron, octahedron
- Plans and elevations are used to define a 3D shape.

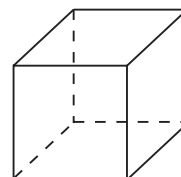
 denotes that the topic is not on the current CXC/CSEC Mathematics syllabus and therefore not examined, but is of relevance to the content of the Unit.

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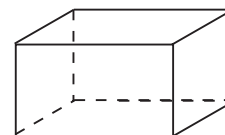
Introduction to SIM

Glossary of terms

Cube all side lengths equal (square faces) and all angles right angles



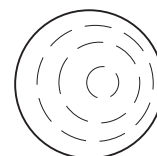
Cuboid faces a combination of rectangles (opposite faces equal) and all angles right angles



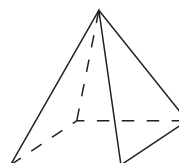
Cylinder has a circular cross-section throughout



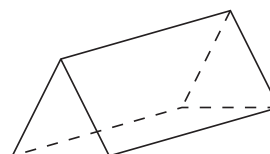
Sphere all points on the surface are equidistant from the centre



Pyramid all slant edges from the base meet at a vertex

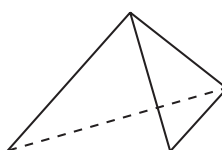


Prism cross-section remains the same throughout



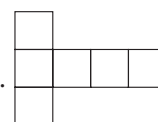
Note: a cube is a square-based prism with all sides equal.

Tetrahedron all faces are triangles



Octahedron solid shape with eight faces

Net of a 3D shape can be cut and folded to form the 3D shape: e.g.



is a net for a cube.

Plans and elevations (front and side) define the 3D shape: e.g.,

