Task 1

3D Shapes

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3D shapes are solids that consist of **3 dimensions - length, breadth (width), and height**. 3D in the word 3D shapes means three-dimensional. Every 3D geometric shape occupies some space based on its dimensions and we can see many 3D shapes all around us in our day-to-day life. Some examples of 3D shapes are **cube, cuboid, cone, and cylinder.**

Real-Life Examples of 3D Geometric Shapes

Types of 3D Shapes

There are various types of 3D shapes that have different bases, volumes, and surface areas.
Let us discuss each one of them.

Shapes

1. It is shaped like a ball and is perfectly symmetrical.
2. It has a radius, diameter, circumference, volume, and surface area.
3. Every point on the sphere is at an equal distance from the center.
4. It has one face, no edges, and no vertices.
5. It is not a polyhedron since it does not have flat faces.

Cylinder

a. It has one curved face.

b. The shape stays the same from the base to the top.

c. It is a three-dimensional object with two identical ends that are either circular or oval.

d. A cylinder in which both circular bases lie on the same line is called a right cylinder. A cylinder in which one base is placed away from another is called an oblique cylinder.

Cone

- A cone has a circular or oval base with an apex (vertex).
- A cone is a rotated triangle.
- Based on how the apex is aligned to the center of the base, a right cone or an oblique cone is formed.

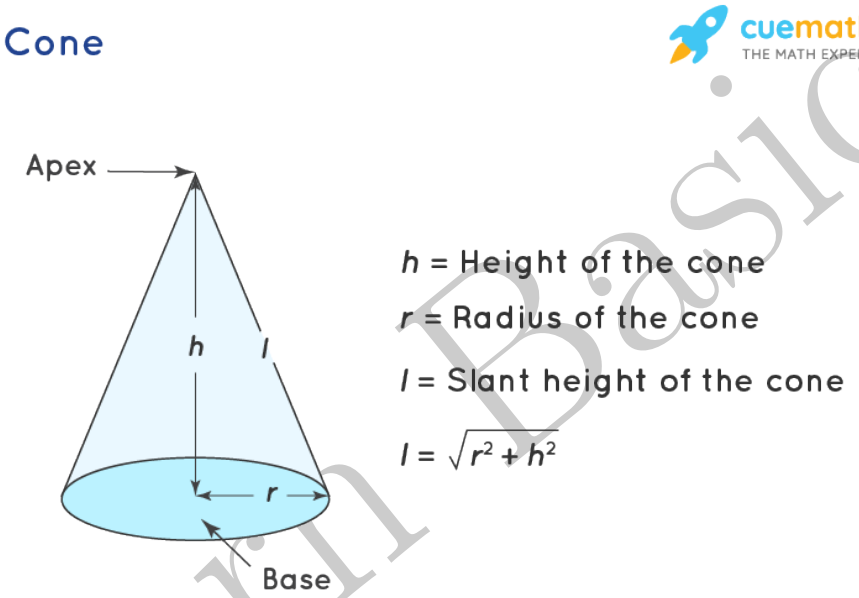

Figure 1: math

Properties of 3D Shapes

Every 3D shape has some properties which help us to identify them easily. Let us discuss each of them briefly.

3D Shapes	Properties
Cylinder	i) It has a flat base and a flat top. ii) The bases are always congruent and parallel. iii) It has one curved side.
Cone	iv) It has a flat base. v) It has one curved side and one-pointed vertex at the top or bottom known as the apex.
Cube	vi) It has six faces in the shape of a square. vii) The sides are of equal lengths. viii) 12 diagonals can be drawn on a cube.

3D Shapes Formulas

As discussed, all 3 Dimensional shapes have a surface area and volume. The following table shows different 3D shapes and their formulas.

3D Shape	Formulas	
Sphere	Diameter	$2 \times r$; (where 'r' is the radius)
	Surface Area	$4\pi r^2$
	Volume	$\frac{4}{3}\pi r^3$
Cylinder	Total Surface Area	$2\pi(r + h + r)$; (where 'r' is the radius and 'h' is the height of the cylinder)
	Volume	$\pi r^2 h$
Cone	Curved Surface Area	$\pi r l$; (where 'l' is the slant height and l $= \sqrt{(h^2 + r^2)}$)
	Volume	$\frac{\pi}{3} r^2 h$