

Geometry Info Sheet #52

Cylinders

Definitions

- Cylinder:** A geometric solid with two congruent and parallel flat circular faces (**bases**) connected by a curved surface (called the **lateral surface**)
- Altitude:** A segment with endpoints in the planes containing the two bases of a cylinder and perpendicular to both
- Height:** The length of an altitude of a cylinder
- Axis:** For a cylinder, the segment joining the centers of the two bases
- Right Cylinder:** A cylinder in which the axis is perpendicular to the two bases; the bases are directly opposite each other
- Oblique Cylinder:** A cylinder in which the bases are not directly opposite each other

Since cylinders contain curved surfaces, they are not polyhedrons. Note, also, that cylinders can have elliptical bases, but for purposes of this Info Sheet, circular bases will be assumed.

Formulas

The **lateral area** L of a **right circular cylinder** with perimeter p and height h is given by:

$$L = ph \text{ or } L = 2\pi rh$$

The **surface area** S of a **right circular cylinder** with base area B , lateral area L , radius r , and height h is given by: $S = 2B + L$ or $S = 2\pi r^2 + 2\pi rh$

The **volume** V of **any circular cylinder** with base area B , radius r , and height h is given by:

$$V = Bh \text{ or } V = \pi r^2 h$$