

Volume of Solids

Postulate 27: **Volume of a Cube**

The volume of a cube is the cube of the length of a side

Postulate 28: **Volume Congruence**

If two polyhedra are congruent, then they have the same area

Postulate 29 **Volume Addition**

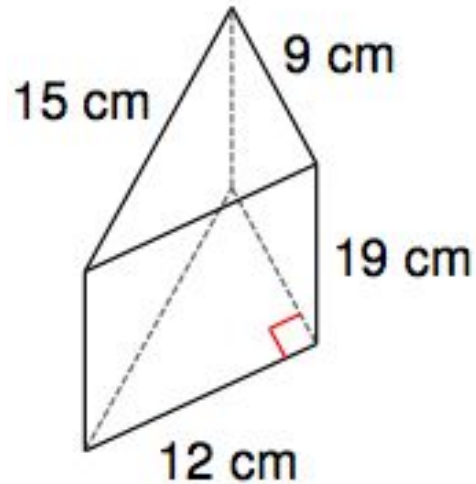
The volume of a solid is the sum of the volumes of its non-overlapping parts



Volume of a Prism

The volume of a prism is:

$$V = Bh$$

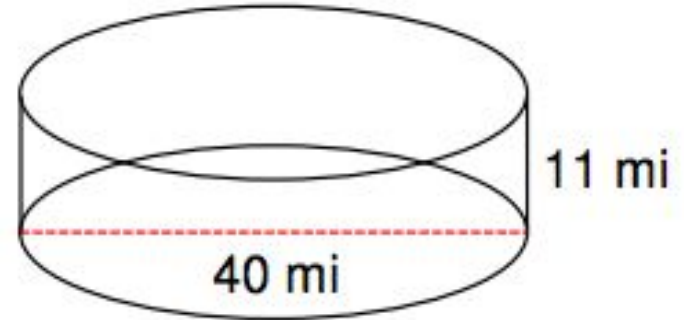


Volume of a Cylinder

The volume of a Cylinder is:

$$V = Bh$$

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



Find the volume of a rectangular prism with a width of 9 cm, a length of 11 cm, and a height of 8 cm.

Find the volume of a cone with a diameter of 6 m and a height of 4 m.

A cube has a volume of 27 m^3 , find the length of the edges.

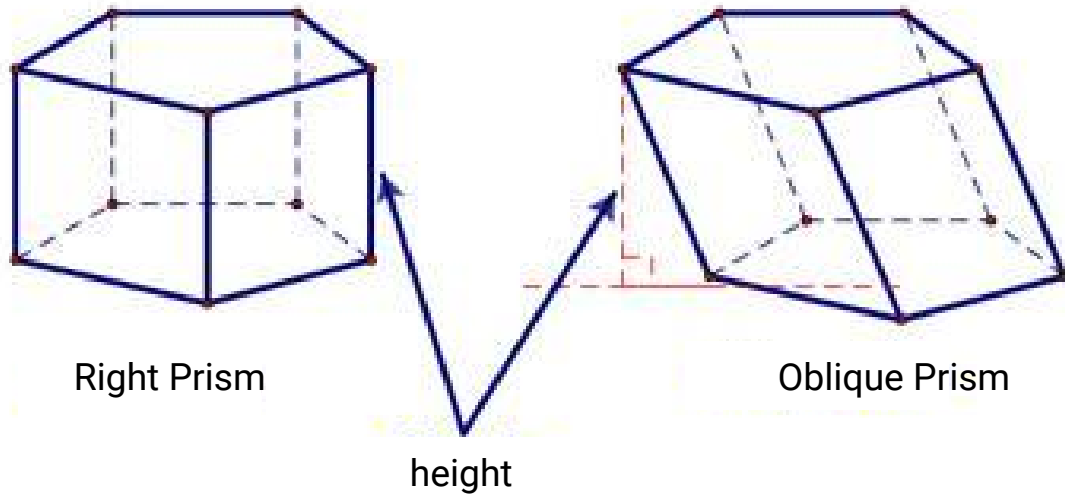
Cavalieri's Principle

If two solids have the same height and the same cross-sectional area at every level, then they have the same volume.

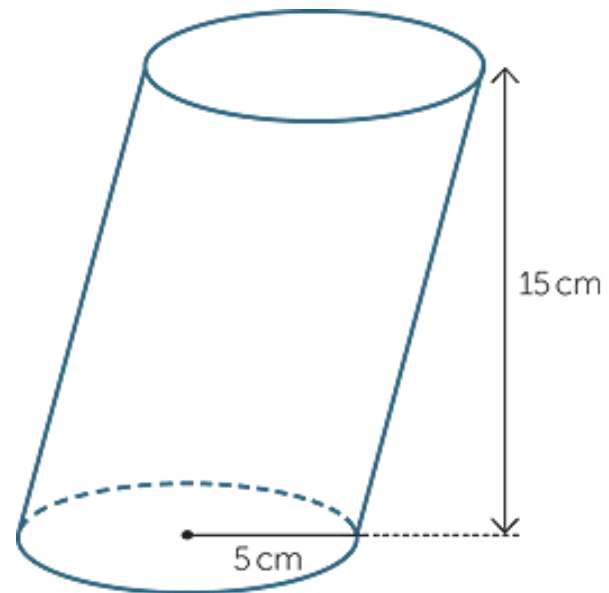
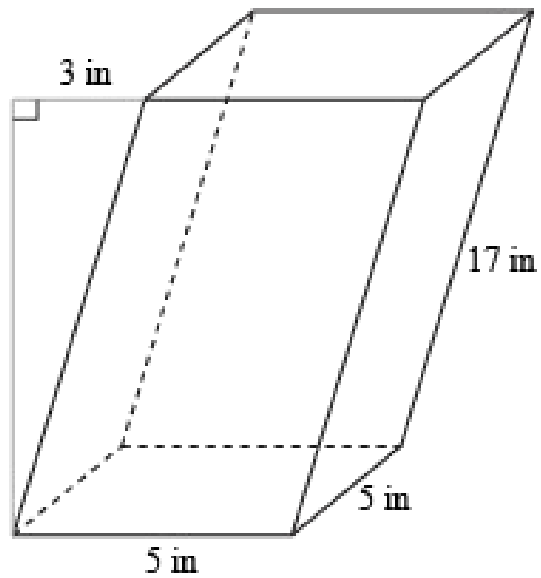


Using Cavalieri's Principle:

We can apply Cavalieri's Principle to find the the volume of an oblique prism or cylinder the same way we find the volume of a right prism or cylinder.



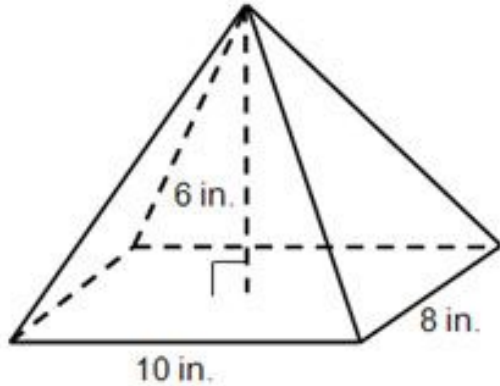
Find the Volume:



Volume of a Pyramid

The volume of a pyramid is:

$$V = \frac{1}{3} Bh$$

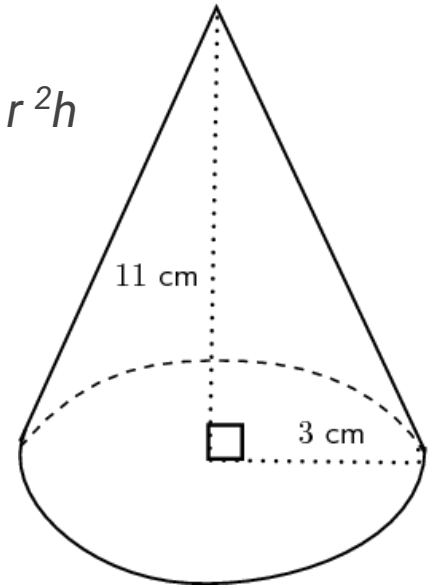


Volume of a Cone

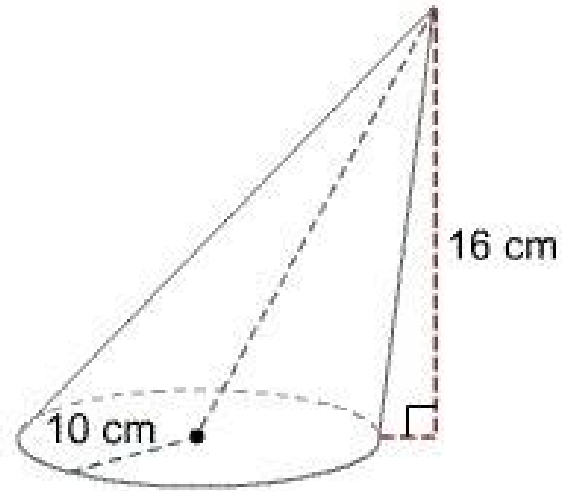
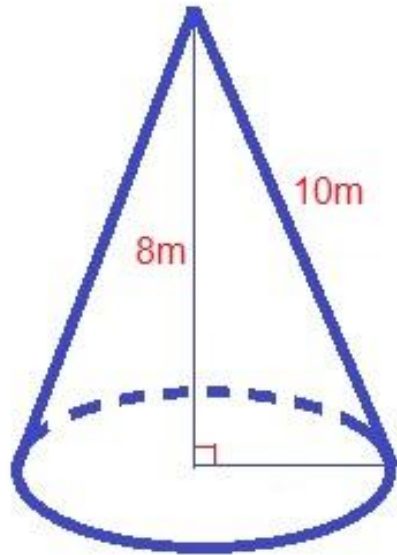
The volume of a Cone is also:

$$V = \frac{1}{3} Bh$$

$$\text{or } V = \frac{1}{3} \pi r^2 h$$



Find the Volume:



The Khafre's Pyramid in Egypt originally had a height of 144 meters, and a volume of 2,226,450 cubic meters. How long were each of the sides of the square base?



Find the Volume:

