WELCOME

Volume and Surface Area 3 Volume

Volume Basics

Volume of a solid is the number of cubic units contained in its interior. Volume is measured in cubic "u³"

POSTULATE 27 Volume of a Cube

The volume of a cube is the cube of the length of its side, or $V = s^3$.

POSTULATE 28 Volume Congruence Postulate

If two polyhedra are congruent, then they have the same volume.

POSTULATE 29 Volume Addition Postulate

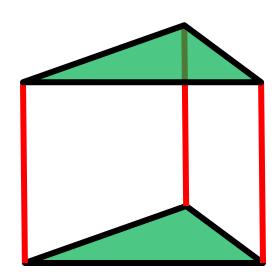
The volume of a solid is the sum of the volumes of all its nonoverlapping parts.

Volume of a Prism & Cylinder

Prism

The volume V of a prism is V = Bh

B = base area & h = height.

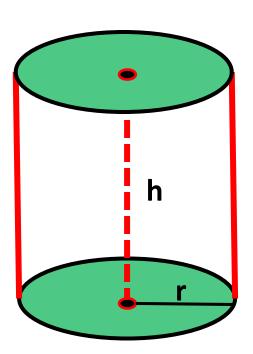


Cylinder

The volume V of a cylinder is

$$V = Bh = \pi r^2 h$$

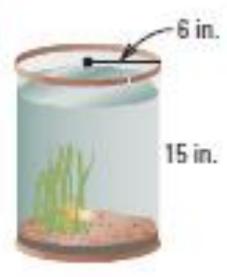
B = circle area & h = height.



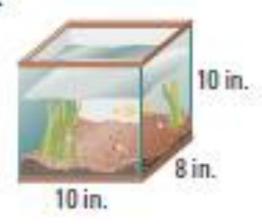


FISH TANKS Find the volume of the tank.

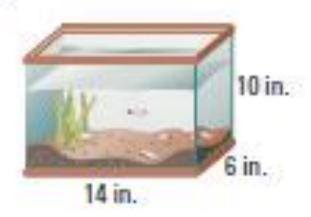
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8.

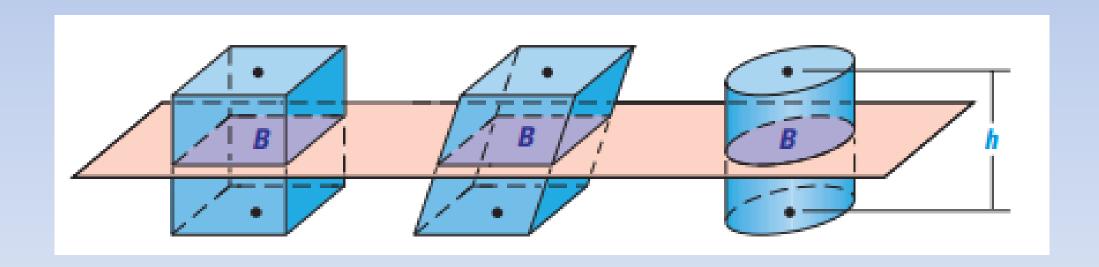


9.



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.



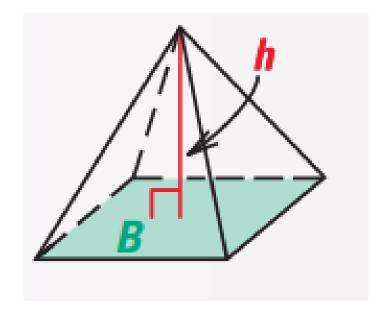
Volume of a Pyramid & Cone

Pyramid

The volume V of a pyramid is

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

B = base area & h = height.

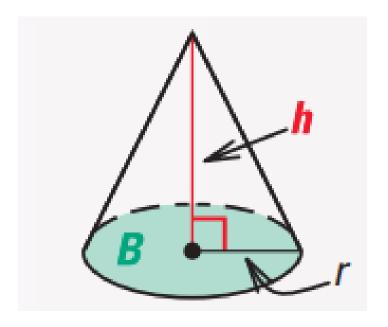


Cone

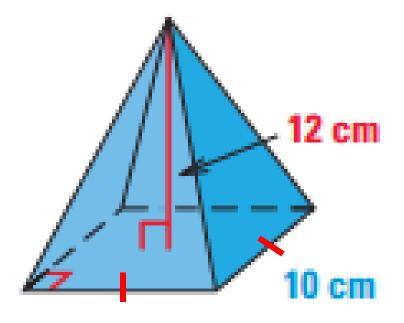
The volume V of a cone is

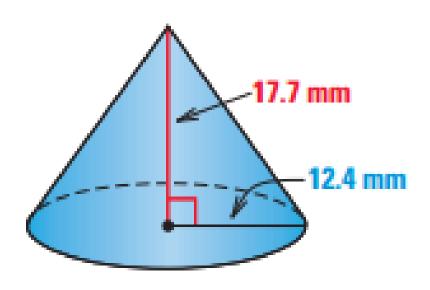
$$V = \frac{1}{3}Bh = \frac{1}{3}\pi r^2 h$$

B = circle area & h = height.



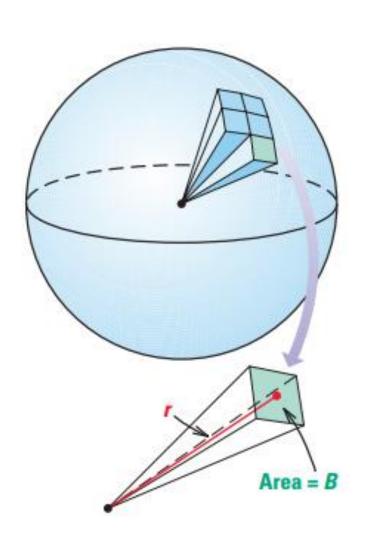
Find the volume



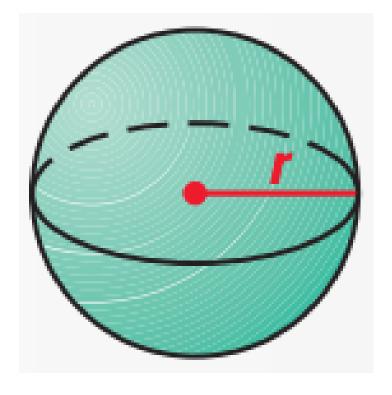


Volume of a Sphere

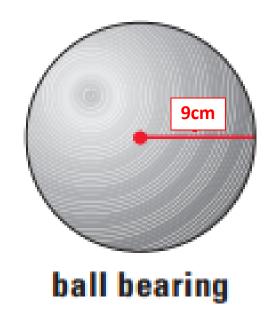
The volume V of a sphere with radius r is...



$$V = \frac{4}{3}\pi r^3$$

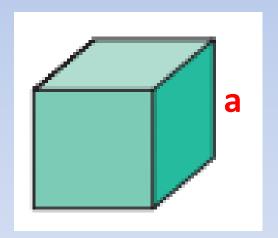


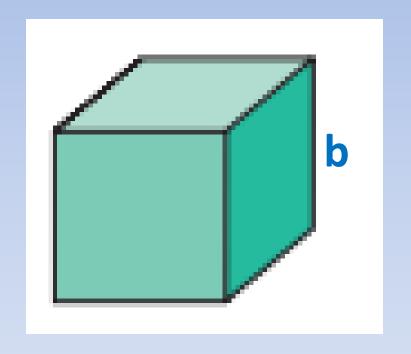
Find the Volume



Ratio of Similar Solids

If two solids are similar to each other and have a scale factor of a:b, then...





Side lengths a:b

Volume a³:b³

Surface Area a²:b²