Volume--finding missing measurement algebraically

Big Idea: Using the formulas for volume, any one missing measurement can be found algebraically.

*It may be necessary to approximate pi (π) before the end of the problem.

Volume Formulas →

Cylinder	Cone	Sphere
$V = \pi r^2 h$	$V = \frac{\pi r^2 h}{3}$	$V = \frac{4\pi r^3}{3}$

Examples:

Find the height of a cylinder with a volume of $600m^3$ and a radius of 8m.

$V = \pi r^2 h$

$600 = \pi 8^2 h$

$\frac{600}{64} = \frac{64\pi h}{64}$

$\frac{9.375}{\pi} = \frac{\pi h}{\pi}$

$2.99m \simeq h$

Find the radius of a cone with a volume of $300m^3$ and a height of 10m.

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

$300 = \frac{\pi r^2 10}{3}$ $\cdot 3$ $\cdot 3$

$\frac{900}{10} = \frac{\pi r^2 10}{10}$

$\frac{90}{\pi} = \frac{\pi r^2}{\pi}$

$28.66 \simeq r^2$

$\sqrt{28.66} \simeq r$

$5.35 \simeq r$ m

Find the radius of a sphere with a volume of $450cm^3$.

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

$450 = \frac{4\pi r^3}{3}$ $\cdot 3$ $\cdot 3$

$\frac{1350}{4} = \frac{4\pi r^3}{4}$

$\frac{337.5}{\pi} = \frac{\pi r^3}{\pi}$

$r^3 \simeq 107.48$

$\sqrt[3]{107.48} \simeq r$

$4.75 \simeq r$ cm