MISSING DIMENSIONS with Volume & Surface Area

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KEY IDEA

You can use the volume or surface area formula to solve for a missing dimension.

1. Write the correct formula for the figure.
2. Substitute the known values.
3. Solve for the missing dimension.
4. Check that your answer makes sense and include units.

Example 1: Cylinder (Volume)

A cylinder has a volume of 450π ft^3 and a radius of 5 ft. Find the height.

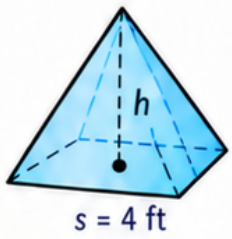


$$V = \pi r^2 h$$
$$450\pi = \pi(5)^2 h$$
$$450\pi = 25\pi h$$
$$450 = 25h$$
$$h = 18$$

The height is 18 ft.

Example 2: Square Pyramid (Volume)

A square pyramid has a volume of 96 ft^3 and a base side length of 4 ft. Find the height.

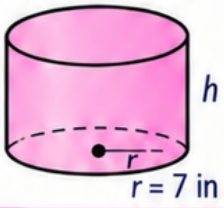


$$V = \frac{1}{3}Bh$$
$$96 = \frac{1}{3}(4^2)h$$
$$96 = \frac{1}{3}(16)h$$
$$96 = \frac{16}{3}h$$
$$h = 18$$

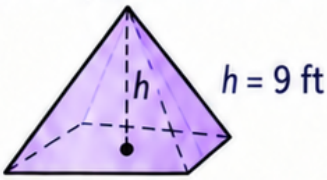
The height is 18 ft.

PRACTICE PROBLEMS

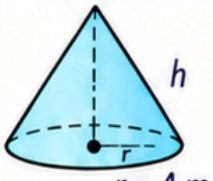
1 A cylinder has a volume of 343π in^3 and a radius of 7 in. Find the height.



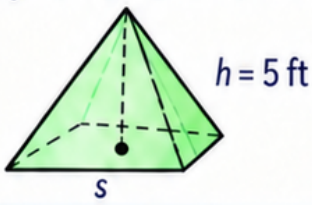
2 A square pyramid has a volume of 192 ft^3 and a base side length of 8 ft. Find the height.



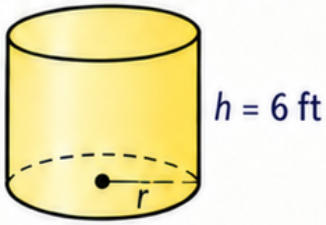
3 A cone has a volume of 96π m^3 and a radius of 4 m. Find the height.



4 A square pyramid has a volume of 75 ft^3 and a height of 5 ft. Find the base side length.



5 A cylinder has a surface area of 144π ft^2 and a height of 6 ft. Find the radius.



6 A cone and a cylinder have the same base area and the same height. The volume of the cylinder is 210 m^3. What is the volume of the cone?

