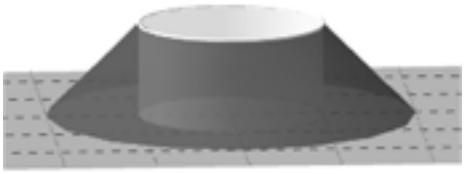
Problem 5

A cylindrical 2 in diameter hole is drilled out along the axis of symmetry of a cone with radius and height both of 2 in. Find the volume of the resulting solid.



Answer

$$\boxed{\frac{4\pi}{3}}$$

Explanation

The volume of the frustum of the cone is given by the difference between the whole cone, and the volume of the top cone.

That is: $\frac{1}{3}\pi R^2 H - \frac{1}{3}\pi r^2 h \to \frac{\pi}{3}((2)^2(2) - (1)^2(1)) \to \frac{7\pi}{3}$

Subtracting out the volume of the cylinder, $\pi r^2 h \to \pi(1)^2(1) \to \pi$, we have:

$\frac{7\pi}{3} - \pi \to \frac{4\pi}{3}$