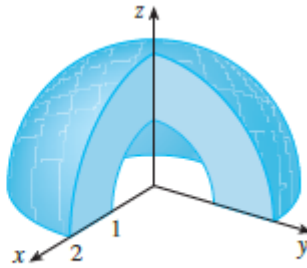
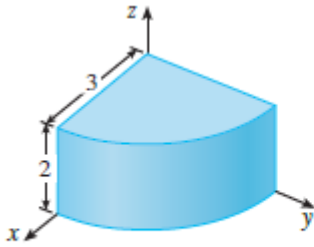


1. Set up the triple integral of an arbitrary continuous function  $f(x, y, z)$  in cylindrical or spherical coordinates over the solid shown:



2. Sketch the solid whose volume is given by the integral and evaluate the integral:  $\int_0^{2\pi} \int_{\pi/2}^{\pi} \int_1^2 \rho^2 \sin \phi \, d\rho \, d\phi \, d\theta$ .

3. Find the volume of the solid that lies above the cone  $\phi = \frac{\pi}{3}$  and below the sphere  $\rho = 4 \cos \phi$ .

4. Set up but do not evaluate  $\int \int \int_E y^2 dV$  where  $E$  is the solid hemisphere  $x^2 + y^2 + z^2 \leq 9$  and  $y \geq 0$ .