The region of integration is given in spherical coordinates by
$E = \{(\rho, \theta, \phi) \mid 2 \le \rho \le 4, 0 \le \theta \le \pi/2, \pi/2 \le \phi \le \pi\}$.
This represents the solid region between the spheres $\rho = 2$ and $\rho = 4$ in the fifth octant.

$$\begin{aligned}\int_0^{\pi/2} \int_{\pi/2}^{\pi} \int_2^4 \rho^2 \sin(\phi)\, d\rho\, d\phi\, d\theta &= \int_0^{\pi/2} d\theta \int_{\pi/2}^{\pi} \sin(\phi)\, d\phi \int_2^4 \rho^2\, d\rho \\ &= [\theta]_0^{\pi/2} \, [-\cos(\phi)]_{\pi/2}^{\pi} \, \left[\tfrac{1}{3}\rho^3\right]_2^4 \\ &= (\pi/2)(1)(56/3) = (28/3)\pi\end{aligned}$$