

- (a) The hollow ball is a spherical shell with outer radius 20 cm and inner radius 19.2 cm. If we center the ball at the origin of the coordinate system and use centimeters as the unit of measurement, then spherical coordinates conveniently describe the hollow ball as $19.2 \leq \rho \leq 20$, $0 \leq \theta \leq 2\pi$, $0 \leq \phi \leq \pi$.
- (b) If we position the ball as in part (a), one possibility is to take the half of the ball that is above the xy -plane which is described by $19.2 \leq \rho \leq 20$, $0 \leq \theta \leq 2\pi$, $0 \leq \phi \leq \pi/2$. Another one possibility is to take the half of the ball that is to the right of the xz -plane which is described by $19.2 \leq \rho \leq 20$, $0 \leq \theta \leq \pi$, $0 \leq \phi \leq \pi$.