

$$15.7 \quad 16 \cdot \frac{16}{3} \pi, \quad E = \{ (r, \theta, z) \mid 0 \leq \theta \leq 2\pi, 0 \leq r \leq 2, 0 \leq z \leq r \}.$$

$$20 \quad -\frac{255}{4} \pi.$$

$$22. \quad \frac{4}{3} \pi (8 - 3^{\frac{3}{2}})$$

$$30 \quad \frac{162}{5} \pi.$$