Da cui

$$\text{vol}(D) = \int_1^3 dz \iint_{D\cap\{z=z_0\}} dx\,dy \overset{\text{simmetria rispetto } z=2,\ \text{simmetria rispetto } y=0}{=}$$

$$= 4\int_1^2 dz \iint_{D\cap\{z=z_0\}\cap\{y>0\}} dx\,dy$$

$$\overset{\text{simmetria rispetto } x=2}{=} 8\int_1^2 dz \int_2^{1+z} 2\sqrt{1-(x-z)^2}\,dx \overset{t=x-z}{=}$$

$$= 16\int_1^2 dz \int_{2-z}^{1} \sqrt{1-t^2}\,dt \overset{t=\cos\theta}{=}$$

$$= 16\int_1^2 dz \int_{\arccos(2-z)}^{0} (-\sin^2\theta)\,d\theta = 8\int_1^2 \left[\frac{\sin(2\theta)}{2}-\theta\right]_{\arccos(2-z)}^{0} dz$$

$$= 8\int_1^2 \left[\arccos(2-z) - (2-z)\sqrt{1-(2-z)^2}\right] dz$$

$$\overset{s=2-z}{=} 8\int_0^1 \left[\arccos s - s\sqrt{1-s^2}\right] ds$$

$$= 8\left\{\cancel{\left[s\arccos s\right]_0^1}^{\,0} + \int_0^1 \left(\frac{s}{\sqrt{1-s^2}} - s\sqrt{1-s^2}\right) ds\right\}$$

$$= \frac{8}{2}\int_0^1 \left(\frac{1}{\sqrt{1-t}} - \sqrt{1-t}\right) dt \qquad (t = s^2,\ 2s\,ds = dt)$$

$$= \frac{16}{3}$$