

Evaluate.

1. 
$$\int_{-2}^2 \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} \int_{-\sqrt{4-x^2-y^2}}^{\sqrt{4-x^2-y^2}} (x^2z + y^2z + z^3) dz dy dx$$

2.  $\int \int_{\mathcal{B}} \int dV$  where  $\mathcal{B}$  is the region bounded by the sphere  $\rho = 2 \cos \phi$  and the hemisphere  $\rho = 1, z \geq 0$ .