1. Let $D = \{(x, y) : 0 \leq x \leq 1, 0 \leq y \leq \sqrt{1-x^2}\}$. Compute $\int\int_D e^{-x^2-y^2} \, dA$.

2. Convert the iterated integral
   $$\int_0^1 \int_{\sqrt{x}}^{1-x} \int_0^{1-y} f(x, y, z) \, dz \, dy \, dx$$
into the iterated integral in the order of $dx \, dy \, dz$.

3. Convert the following iterated integral to the integration formula in the cylindrical coordinates,
   $$\int_{-1}^1 \int_{\sqrt{1-x^2}}^{\sqrt{2-x^2-y^2}} \int_0^{2-x^2-y^2} yz \, dz \, dy \, dx$$.

4. Let $E$ be the common interior region of two spheres $x^2 + y^2 + z^2 = 1$ and $x^2 + y^2 + (z-1)^2 = 1$. Find the integral formula (possibly sum of integrals) of the volume of $E$ with the spherical coordinates.