1. Let $D$ be the solid hemisphere $0 \leq x^2 + y^2 + z^2 \leq 4$, $z \geq 0$. Compute the integral of $\sqrt{x^2 + y^2 + z^2}$ over $D$.

2. Let $R$ be the region defined by $-3 \leq x + 5y \leq 3$, $0 \leq 2x + 7y \leq 4$. Use the change of coordinates $u = x + 5y$, $v = 2x + 7y$ to transform the integral $\int_R xy^2 \, dA$ into an iterated integral in the $uv$-plane. (Do not evaluate the integral.)