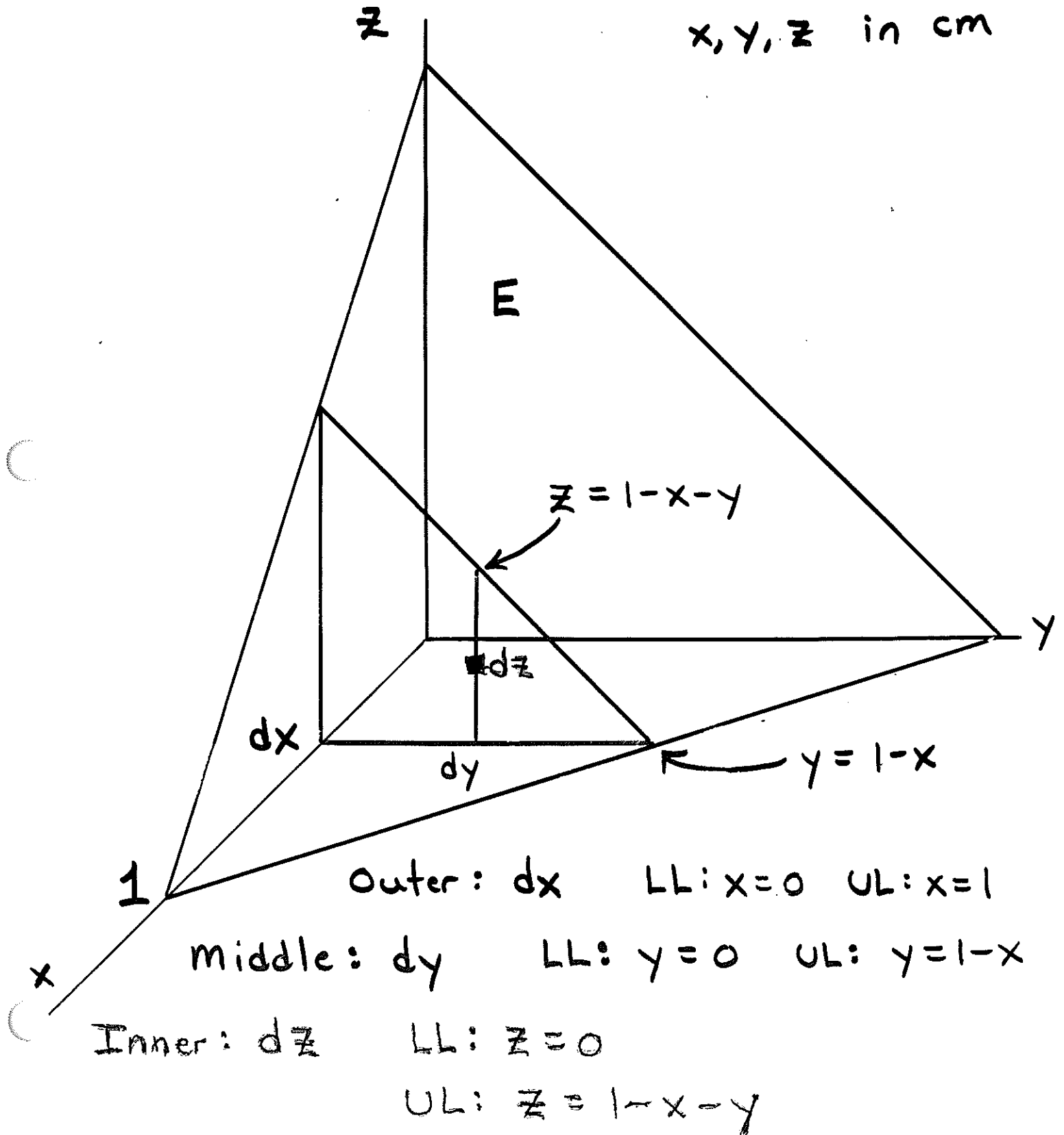


Ex. Find the volume of the tetrahedron bound by the planes $z=0$, $x=0$, $y=0$, & $z=1-x-y$.

x, y, z in cm



$$So \quad dV = dz \, dy \, dx$$

$$V = \iiint_E dV = \iiint_E dz \, dy \, dx$$

$$= \int_0^1 \int_0^{1-x} \int_0^{1-x-y} dz \, dy \, dx$$

$$= \int_0^1 \int_0^{1-x} z \Big|_{z=0}^{1-x-y} dy \, dx$$

$$= \int_0^1 \int_0^{1-x} (1-x-y) dy \, dx$$

$$= \int_0^1 \left[(1-x)y - \frac{1}{2}y^2 \right] \Big|_{y=0}^{1-x} dx$$

$$= \int_0^1 \left[(1-x)^2 - \frac{1}{2}(1-x)^2 \right] dx$$

$$= \frac{1}{2} \int_0^1 (1-x)^2 dx \quad u = 1-x$$

$$= \dots$$

$$= \frac{1}{6} \text{ cm}^3 = V$$