

# Volume integrals

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The function  $f(x,y,z) = y$  is defined on the domain:

$$\{(x,y,z) \mid 0 \leq y, x^2 + y^2 + z^2 \leq 1\}$$

When finding the integral I need to have upper and lower bounds. So far I have found:

$$y^2 \leq 1 - x^2 - z^2 \Leftrightarrow$$
$$y \leq \sqrt{1 - x^2 - z^2}$$

I then have:

$$0 \leq y \leq \sqrt{1 - x^2 - z^2}$$

and can then repeat for z and x:

$$z \leq \sqrt{1 - x^2 - y^2}$$
$$x \leq \sqrt{1 - z^2 - y^2}$$

But then I still need the lower bounds for z and x or am I approaching the problem in a wrong way?

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