Find the upper limit of integration $L$ in the equation

$$\iiint_{R} f(x, y, z) \, dV = \int_{0}^{2} \int_{0}^{1-x/2} \int_{0}^{L} f(x, y, z) \, dz \, dy \, dx,$$

where $R$ is the tetrahedron with vertices $(0, 0, 0), (2, 0, 0), (0, 1, 0)$, and $(0, 1, 3)$.

$L = \ldots$

A 1
B $1 - x/2 - y$
\textbf{C} 3y
D $y - 3$
E I got something different.
The integral
\[ \int_0^{2\pi} \int_0^\pi \int_0^1 1 \, d\rho \, d\phi \, d\theta, \]
computes the volume inside the sphere of radius 1.

True or False.

A True.
B False.
C I don’t know.
Find the missing limit of integration $L$

$$\int_{0}^{\frac{\pi}{4}} \int_{0}^{\pi} \int_{0}^{1} \rho^3 \sin^2(\phi) \cos(\theta) \, d\rho \, d\theta \, d\phi = \int_{0}^{L} \int_{\cdots} \int_{\cdots} \cdots \, dz \, dr \, d\theta,$$

$L = \ldots$

A 1

B $\frac{\pi}{4}$

C $\pi$

D I got something different.
Spherical to cylindrical

Find the missing limit of integration $L$

$$\int_0^{\pi/4} \int_0^{\pi} \int_0^1 \rho^3 \sin^2(\phi) \cos(\theta) \, d\rho \, d\theta \, d\phi = \int_0^{\pi} \int_0^L \int_{\cdots} \cdots \cdots \, dz \, dr \, d\theta,$$

$L = \ldots$

A $\theta$
B $\pi - \theta$
C 1
D $\frac{\sqrt{2}}{2}$
E I got something different.
Spherical to cylindrical

Find the missing limit of integration \( L \)

\[
\int_0^{\pi/4} \int_0^\pi \int_0^1 \rho^3 \sin^2(\phi) \cos(\theta) \, d\rho \, d\theta \, d\phi = \int_0^{\pi/2} \int_0^{\sqrt{2}/2} \int_L \sqrt{1-r^2} \cdots \, dz \, dr \, d\theta,
\]

\( L = \ldots \)

A \( r \)

B \( r - \theta \)

C \( r^2 - 1 \)

D \( r + \theta^2 \)

E I got something different.
Find the integrand

\[ \int_0^{\pi/4} \int_0^\pi \int_0^1 \rho^3 \sin^2(\phi) \cos(\theta) \, d\rho \, d\theta \, d\phi = \int_0^\pi \int_0^{\sqrt{2}/2} \int_0^{\sqrt{1-r^2}} M \, dz \, dr \, d\theta, \]

\[ M = \ldots \]

A \quad r^2

B \quad r^2 \cos(\theta)

C \quad r^2 \sin(\theta)

D \quad r \cos(\theta)

E \quad I got something different.