

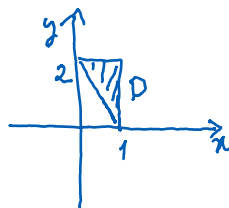
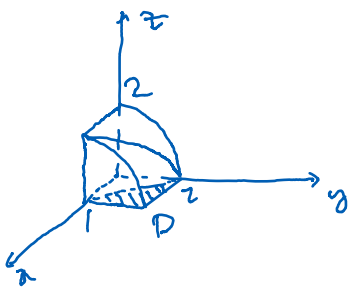
# Lecture 26

Friday, June 7, 2024 4:04 PM

Practice with triple integrals:

Ex Evaluate  $\iiint_E yz \, dV$

where  $E$  is the solid bounded by the surfaces  $x=1$ ,  $z=0$ ,  $y=2-2x$ ,  $y^2+z^2=4$  in the first octant.



$$E = \{(x, y, z) : (x, y) \in D, 0 \leq z \leq \sqrt{4-y^2}\}$$

$$\begin{aligned} \iiint_E yz \, dV &= \iint_D \int_0^{\sqrt{4-y^2}} yz \, dz \, dA = \iint_D y \frac{4-y^2}{2} \, dA = \int_0^2 \int_{1-\frac{y}{2}}^1 y \frac{4-y^2}{2} \, dx \, dy \\ &= \dots = \frac{16}{15} \end{aligned}$$

Ex Evaluate  $\iiint_E z \, dV$

where  $E$  is the solid bounded by the surfaces  $y^2+z^2=9$ ,  $x=0$ ,  $z=0$ ,  $y=3x$  in the first octant.

Ex Evaluate  $\iiint_E xy \, dV$  where  $E$  is the tetrahedron with vertices at  $(0, 0, 0)$ ,  $(1, 0, 1)$ ,  $(0, 1, 1)$ ,  $(0, 0, 1)$ .