



Problem:

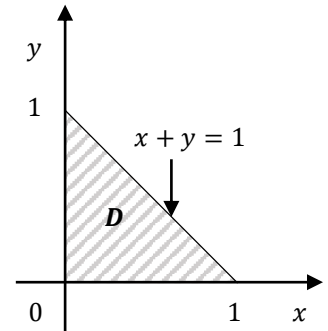
Use the double integral to calculate the area of the given region  $D$ :

$$D: \begin{cases} x = 0, y = 0 \\ x + y = 1 \end{cases}$$

Solution:

The area of the region  $D$  is equal to the double integral

$$\begin{aligned} S &= \iint_{(D)} 1 dx dy = \int_0^1 dx \int_0^{1-x} 1 dy = \int_0^1 \left[ y \right]_0^{1-x} dx = \int_0^1 (1-x) dx = \\ &= \left( x - \frac{x^2}{2} \right) \Big|_0^1 = 1 - \frac{1}{2} = \frac{1}{2} \Rightarrow S = \frac{1}{2}. \end{aligned}$$



Answer:  $\frac{1}{2}$ .