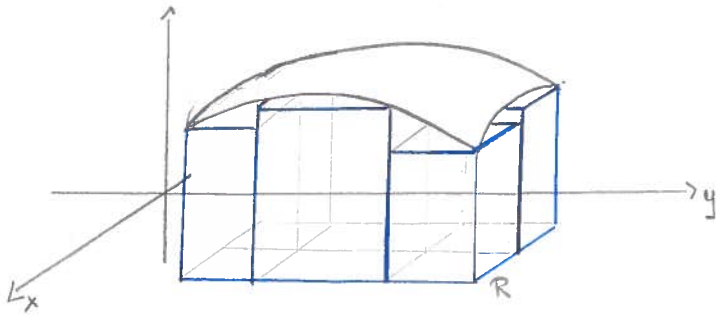
REPETITION 03/03



Π partition of R

f is (Riemann) integrable $\Leftrightarrow$

$$\underline{\iint_R} f(x,y)\,d(x,y) = \overline{\iint_R} f(x,y)\,d(x,y) =: \iint_R f(x,y)\,d(x,y)$$

lower Riemann integral — upper Riemann integral

Theorem Let $R = [a,b] \times [c,d]$ and $f : R \subset \mathbb{R}^2 \to \mathbb{R}$ be integrable

If $y \mapsto f(x,y)$ is integrable on $[c,d]$

$$\Rightarrow \iint_R f(x,y)\,d(x,y) = \int_a^b \int_c^d f(x,y)\,dy\,dx$$

If $x \mapsto f(x,y)$ is integrable on $[a,b]$

$$\Rightarrow \iint_R f(x,y)\,d(x,y) = \int_c^d \int_a^b f(x,y)\,dx\,dy$$