MATH 202
ÉNONCÉS DES EXERCICES 6

A. ZEYTİN

(1) En prenant une équipartition de l'intervalle $[a, b]$ en n parties et $[c, d]$ en m parties calculer $R(f, \mathcal{P}_{\min})$ et $R(f, \mathcal{P}_{\max})$ de l'integrale double : $\int_a^b \left(\int_c^d f(x, y)dy \right) dx$; où :

- $f(x, y) = x$, $[a, b] = [0, 1]$, $n = 2$, $[c, d] = [-1, 0]$, $m = 2$
- $f(x, y) = x$, $[a, b] = [0, 1]$, $n = 2$, $[c, d] = [-1, 0]$, $m = 3$
- $f(x, y) = x$, $[a, b] = [0, 1]$, $n = 3$, $[c, d] = [-1, 0]$, $m = 2$
- $f(x, y) = y^2$, $[a, b] = [-1, 1]$, $n = 2$, $[c, d] = [-1, 0]$, $m = 2$
- $f(x, y) = y^2$, $[a, b] = [-1, 1]$, $n = 2$, $[c, d] = [-1, 0]$, $m = 3$
- $f(x, y) = y^2$, $[a, b] = [-1, 1]$, $n = 3$, $[c, d] = [-1, 0]$, $m = 2$
- $f(x, y) = e^{x+y}$, $[a, b] = [0, 2]$, $n = 2$, $[c, d] = [0, 4]$, $m = 2$
- $f(x, y) = e^{x+y}$, $[a, b] = [0, 2]$, $n = 2$, $[c, d] = [0, 4]$, $m = 3$
- $f(x, y) = e^{x+y}$, $[a, b] = [0, 2]$, $n = 3$, $[c, d] = [0, 4]$, $m = 2$

(2) Calculer les intégrales itérées suivantes :

- $\int_0^1 \left(\int_{-1}^1 x^2 + xy + y^3 dx \right) dy$
- $\int_{-1}^1 \left(\int_0^1 x^2 + xy + y^3 dx \right) dy$
- $\int_0^{\pi/2} \left(\int_{-\pi/2}^0 x \sin(y) + y \sin(x) dx \right) dy$
- $\int_{-1}^1 \left(\int_0^1 \frac{x}{y^2 + 1} dx \right) dy$
- $\int_{-1}^1 \left(\int_0^1 \frac{x}{y^2} dx \right) dy$
- $\int_{-\pi/4}^{\pi/4} \left(\int_0^{\pi/2} x^2 \sin(y) + y^2 \sin(x) dx \right) dy$