MAT 2219 - Cálculo III para Química

Semestre 2016-II / Exercícios (Lista 2)

Prof. Gerard J. A.M.

Exercício 1 *Com a mudança de coordenadas apropriada calcule as integrais duplas*

1. $\iint_R \frac{\cos(4x-4y)}{\sin(2x+y)} dxdy, \quad R : x \geq 0, y \geq 0, \quad \alpha \leq 2x + y \leq \beta, \quad \alpha > 0.$
2. $\iint_R x^2\sqrt{x^2+y^2}dxdy, \quad R : x^2 \leq y \leq x.$
3. $\iint_R (x-y)dxdy, \quad R : x^2 + y^2 \leq 1, \quad x \geq 0.$
4. $\iint_R (x^2-y^2)dxdy, \quad R : x^2 + y^2 \leq 1, \quad x \geq 0.$
5. $\iint_R e^{-x^2-y^2}dxdy, \quad R = [-a, a] \times [-a, a].$
6. $\iint_R x^2\sqrt{x^2+3y^2}dxdy, \quad R : 0 \leq x \leq 1, \quad 0 \leq y \leq x.$
7. $\iint_R r^2\sin(\theta)drd\theta, \quad R : x^2 - ax + y^2 \leq 0, \quad y \geq 0, \quad a > 0.$
8. $\int_{-a}^{a}\int_{-\sqrt{a^2-x^2}}^{\sqrt{a^2-x^2}} \sqrt{a^2-x^2-y^2}dxdy.$
9. $\iint_R ydxdy, \quad R : x^2 - 2x + y^2 < 0, \quad 0 < x < y.$

Exercício 2 *Calcule a área das seguintes superfícies*

1. $S : T(u, v) = (u, v, 1 - u^2), \quad u \geq 0, v \geq 0, u + v \leq 1.$
2. $S : T(u, v) = (u^3\cos(v), u^3\sin(v), u^4), \quad 0 \leq u \leq 1, 0 \leq v \leq 2\pi.$
3. $S : T(u, v) = (u, v, u^2 + v^2), \quad u^2 + v^2 \leq 4.$