Revisão para a Prova Substitutiva
Cálculo 2

Derivadas Parciais

1. Calcule as derivadas parciais de primeira ordem das seguintes funções:

   (a) $f(x,y) = x^2 y + 3xy^3$

   (b) $f(x,y) = e^x sen(y)$

   (c) $f(x,y) = \ln(x^2 + y^2)$

   (d) $f(x,y) = x^3 + y^3 - 3xy$

   (e) $f(x,y) = \sqrt{x^2 + y}$

   (f) $f(x,y) = xe^{xy}$

   (g) $f(x,y) = y\cos(xy)$

   (h) $f(x,y) = x^4 y^2$

   (i) $f(x,y) = \dfrac{x}{x^2 + y}$

   (j) $f(x,y) = x^2 + y^2 + xy$

   (k) $f(x,y) = ye^{x+y}$

   (l) $f(x,y) = sen(x) + sen(y)$

   (m) $f(x,y) = \dfrac{1}{x - y}$

   (n) $f(x,y) = x^2 y^2 + 5xy$

2. Calcule as derivadas parciais de segunda ordem das seguintes funções:

   (a) $f(x,y) = xy^2$

   (b) $f(x,y) = e^x + \cos(x)sen(y)$

   (c) $f(x,y) = x^2 + y^2$

   (d) $f(x,y) = x^3 + y^3 - 3xy$

3. Analise máximos e mínimos das seguintes funções.

    (a) $f(x,y) = x^3 - 3x^2 + y^3 - 3y^2$

    (b) $f(x,y) = x^3 - 6x^2 + y^3 - 3y^2$

    (c) $f(x,y) = x^3 - 3x^2 + y^3 - 6y^2$

    (d) $f(x,y) = x^3 - 6x^2 + y^3 - 6y^2$

Integrais Duplas

1. Calcule a integral dupla $\iint_D f(x,y)\, dx\, dy$:

    (a) $f(x,y) = xy, \quad D = [0,1] \times [2,3]$

    (b) $f(x,y) = x + y, \quad D = [1,2] \times [0,1]$

    (c) $f(x,y) = 2x - y, \quad D = [0,2] \times [0,3]$

    (d) $f(x,y) = 3x + 4y, \quad D = [1,3] \times [1,2]$

    (e) $f(x,y) = x^2 + y, \quad D = [0,1] \times [0,2]$

    (f) $f(x,y) = y^2 + x, \quad D = [2,3] \times [1,2]$

    (g) $f(x,y) = 5x - 2y, \quad D = [0,1] \times [1,4]$

    (h) $f(x,y) = x^2 + y^2, \quad D = [1,2] \times [2,3]$

    (i) $f(x,y) = 4x + y^2, \quad D = [0,2] \times [0,1]$

    (j) $f(x,y) = 2x + 3y, \quad D = [1,4] \times [0,2]$

2. Calcule a integral dupla $\iint_D f(x,y)\, dx\, dy$:

    (a) $f(x,y) = xy, \quad D = \{(x,y) : 0 \leq x \leq 3, x \leq y \leq x + 2\}$

    (b) $f(x,y) = 2, \quad D = \{(x,y) : 0 \leq x \leq 3, x + 1 \leq y \leq x + 2\}$

    (c) $f(x,y) = y, \quad D = \{(x,y) : 0 \leq x \leq 1, x^2 \leq y \leq x\}$

    (d) $f(x,y) = x + y, \quad D = \{(x,y) : 0 \leq x \leq 2, \ x \leq y \leq 2x + 1\}$

    (e) $f(x,y) = x^2, \quad D = \{(x,y) : 1 \leq x \leq 3, \ \frac{x}{2} \leq y \leq x\}$

    (f) $f(x,y) = 3y, \quad D = \{(x,y) : -1 \leq x \leq 1, \ x^2 \leq y \leq 1\}$

    (g) $f(x,y) = x^2 + y, \quad D = \{(x,y) : 0 \leq x \leq 2, \ 0 \leq y \leq x^2 + 1\}$

    (h) $f(x,y) = 4x - y, \quad D = \{(x,y) : 0 \leq x \leq 1, \ x \leq y \leq \sqrt{x} + 1\}$