Análise Matemática II

LISTA 5

(1) (a) $\log 2 - \sum_{n\geq 1} \dfrac{(x-1)^n}{n2^n}$, $x \in [-1, 3[$

(b) $\sum_{n\geq 1} n(x+1)^{n-1}$, $x \in]-2, 0[$

(c) $-2 \sum_{n\geq 1} \dfrac{(-1)^n}{n}[(x-1)^{n+2} + 2(x-1)^{n+1} + (x-1)^n]$, $x \in [0, 2[$

(2) (a)

(b) $S'(0) = 0$, $S''(0) > 0$

(c) $\frac{3x^2 - x^4}{(1-x^2)^2}$

(3) $S(x) = \begin{cases} -x + 1, & x \in]0, 1] \\ 0, & x = 0 \end{cases}$

(4) (a) $2/3 \sum_{n\geq 0}(-1)^n(x-2)^n/2^n$, $x \in]0, 4[$

(b) $-17!/(3.2^{16})$

(5) (a) $\sum_{n\geq 0}(\log a)^n x^n/n!$, $x \in \mathbb{R}$

(b) $(1/a^2)\sum_{n\geq 0}(-1)^n(x/a)^{2n}$, $|x| < |a|$

(c) $\sum_{n\geq 0}(-1)^n x^{2n+1}/(2n+1)$, $|x| < 1$

(6) (a) $S(x) = \sum_{n\geq 0} x^n/n!$

(b) 1

(7) (a) $S_f(x) = \sum_{n\geq 0}\alpha(\alpha-1)\ldots(\alpha-n+1)x^n/n!$

(b) $]-1, 1[$

(c)

(8)

(9) (a) $\operatorname{int} B = \emptyset$, $\partial B = B \cup \{(\frac{1}{2}, y) \in \mathbb{R}^2 : -\frac{1}{2} \leq y \leq \frac{1}{2}\}$, $B' = \partial B$

(b) $\operatorname{int} C = \emptyset$, $\partial C = \mathbb{R}^2 = C'$

(10) (a) $\{(x, y) \in \mathbb{R}^2 : x^2 + y^2 \notin \{0, e\}, y \leq x\}$ nem aberto nem fechado

(b) $\{(x, y) \in \mathbb{R}^2 : 0 < x+y-2 \neq 1, y \geq x^2\}$ nem aberto nem fechado

(c) $\{(x, y) \in \mathbb{R}^2 : (y-1)^2 + x^2 \leq 1, xy > 0\}$ nem aberto nem fechado