LISTA DE EXERCÍCIOS 23 – CÁLCULO II

01. Determine os 4 primeiros termos das sequências dadas.

a) $a_n = \dfrac{1-n}{n^2}$ b) $a_n = \dfrac{1}{n!}$ c) $a_n = \dfrac{(-1)^{n+1}}{2n-1}$ d) $a_n = 2 + (-1)^n$

e) $a_n = \dfrac{2^n}{2^{n+1}}$ f) $a_n = \dfrac{2^n - 1}{2^n}$

02. Determine os 10 primeiros termos das sequências dadas por recursão.

a) $a_1 = 1, a_{n+1} = a_n + \dfrac{1}{2^n}$ b) $a_1 = 1, a_{n+1} = \dfrac{a_n}{n+1}$

c) $a_1 = 2, a_{n+1} = (-1)^{n+1} \dfrac{a_n}{2}$ d) $a_1 = -2, a_{n+1} = \dfrac{n a_n}{n+1}$

e) $a_1 = a_2 = 1, a_{n+2} = a_{n+1} + a_n$ f) $a_1 = 2, a_2 = -1, a_{n+2} = \dfrac{a_{n+1}}{a_n}$

03. Verifique se as sequências a seguir convergem ou divergem.

a) $a_n = 2 + (0,1)^n$ b) $a_n = \left(1 - \dfrac{1}{n}\right)^n$ c) $a_n = \operatorname{arctang} n$ d) $a_n = \dfrac{\operatorname{sen} n}{n}$

e) $a_n = \dfrac{3^n . 6^n}{2^{-n} . n!}$ f) $a_n = \left(2 - \dfrac{1}{2^n}\right)\left(3 + \dfrac{1}{2^n}\right)$ g) $a_n = \left(\dfrac{1}{n}\right)^{\frac{1}{\ln n}}$

h) $a_n = \dfrac{n^2 - 2n + 1}{n - 1}$ i) $a_n = \dfrac{n!}{n^n}$ j) $a_n = \dfrac{2n+1}{1 - 3\sqrt{n}}$ k) $a_n = \sqrt[n]{4^n n}$

l) $a_n = \dfrac{1 - 2n}{1 + 2n}$ m) $a_n = \sqrt[n]{3^{2n+1}}$ n) $a_n = \dfrac{n+3}{n^2 + 5n + 6}$ o) $a_n = \dfrac{n!}{2^n . 3^n}$

p) $a_n = \left(\dfrac{n+1}{2n}\right)\left(1 - \dfrac{1}{n}\right)$ q) $a_n = \left(1 - \dfrac{1}{n^2}\right)^n$ r) $a_n = n\pi \cos(n\pi)$

s) $a_n = (3^n + 5^n)^{\frac{1}{n}}$ t) $a_n = \left(1 + \dfrac{7}{n}\right)^n$ u) $a_n = \displaystyle\int_1^n \dfrac{1}{x^p} dx, p > 1$

v) $a_n = \left(\dfrac{3n+1}{3n-1}\right)^n$ w) $a_n = \dfrac{\operatorname{sen}^2 n}{2^n}$ x) $a_n = \dfrac{(\ln n)^{200}}{n}$ y) $a_n = \dfrac{(-4)^n}{n!}$

z) $a_n = \operatorname{sen}\left(\dfrac{\pi}{2} + \dfrac{1}{n}\right)$