MAT 111 —LISTA DE EXERCÍCIOS II

(1) Calcule o limite das sequências abaixo:

(a) $a_n = \dfrac{\sin^2 n}{\log n}$

(b) $a_n = \sqrt[n]{n}$

(c) $a_n = \dfrac{2n}{2n-1}$

(d) $a_n = \dfrac{n!}{n^n}$

(e) $a_n = \dfrac{17n+23}{2-n^2}$

(f) $a_n = \dfrac{n \sin n!}{n^2+1}$

(g) $a_n = \dfrac{1+5^n}{2+3^n}$

(2) Calcule os limites das funções:

(a) $\lim\limits_{x\to -1} \sqrt[3]{\dfrac{x^3+1}{x+1}}$

(b) $\lim\limits_{x\to 1} \dfrac{\sqrt{x^2+3}-2}{x^2-1}$

(c) $\lim\limits_{x\to +\infty} x \sin \dfrac{1}{x}$

(d) $\lim\limits_{x\to +\infty} \left(1+\dfrac{2}{x}\right)^x$

(e) $\lim\limits_{x\to 0} (1+x)^{\frac{3}{x}}$

(f) $\lim\limits_{x\to +\infty} \dfrac{x+1}{2x+1}$

(g) $\lim\limits_{x\to 0} x \sin \dfrac{1}{x}$

(h) $\lim\limits_{x\to +\infty} \left(\dfrac{x-1}{x+3}\right)^{x+2}$

(i) $\lim\limits_{x\to 0} \dfrac{x}{\sin(\pi x)}$

(j) $\lim\limits_{x\to 0} \dfrac{\sin 5x}{\sin 3x}$

(k) $\lim\limits_{x\to +\infty} \left(\dfrac{x^2+x-1}{x^3-2x+7}\right)$

(l) $\lim\limits_{x\to +\infty} x^x$

(m) $\lim\limits_{x\to 2} \dfrac{(x^2-5x+6)(x+1)}{x-2}$

(n) $\lim\limits_{x\to 0} \dfrac{\arcsin x}{x}$

(o) $\lim\limits_{x\to \pi} \dfrac{x^2-\pi^2}{x-\pi}$

(p) $\lim\limits_{x\to p} \dfrac{\sin(x^2-p^2)}{x-p}$

(3) Seja f uma função definida em $\mathbb{R}$ tal que $\lim\limits_{x\to 1} \dfrac{f(x)}{x} = 1$. Calcule:

(a) $\lim\limits_{x\to 1} \dfrac{f(7x)}{3x}$

(b) $\lim\limits_{x\to 1} \dfrac{f(x^2-1)}{x-1}$