TUTORATO DEL 25\11\22

1) Calcolare i seguenti limiti

(i) $\displaystyle\lim_{x\to 0} \frac{x^3 - 3x^2 + 4x}{x^5 - x}$

(ii) $\displaystyle\lim_{n\to +\infty} \frac{\log n^3}{\log(n^3 + 3n^2)}$

(iii) $\displaystyle\lim_{n\to +\infty} \frac{n^2 + n\sin(n)}{1 + n^2 + n}$

(iv) $\displaystyle\lim_{x\to +\infty} \frac{\log(3 + \sin x)}{x^3}$

(v) $\displaystyle\lim_{x\to 5} \frac{x - 5}{\sqrt{x} - \sqrt{5}}$

(vi) $\displaystyle\lim_{n\to +\infty} \frac{\log\left(\sqrt[3]{1 + \frac{9}{n^2}}\right)}{\log\left(\cos\left(\frac{6}{n}\right)\right)}$

(vii) $\displaystyle\lim_{x\to 0} \frac{\log(2 - \cos x)}{\sin^2 x}$

(viii) $\displaystyle\lim_{x\to +\infty} \sqrt{x} - 1 + \cos x$

(ix) $\displaystyle\lim_{n\to +\infty} n^2 \cos\left(\frac{1}{n}\right)$

(x) $\displaystyle\lim_{x\to -\infty} \frac{3^x - 3^{-x}}{3^x + 3^{-x}}$

(xi) $\displaystyle\lim_{x\to 0} \frac{1 - \cos 2x}{\sin^2 3x}$

(xii) $\displaystyle\lim_{x\to 0} \frac{x^3 + x^2 \sin x + \sin^2 x}{x^4 + x^3 + x \sin x}$

(xiii) $\displaystyle\lim_{x\to 0} \left(\frac{1}{\cos x}\right)^{1/x^2}$

(xiv) $\displaystyle\lim_{n\to +\infty} n^2 2^{-\sqrt{n}}$

(xv) $\displaystyle\lim_{x\to 0} \frac{\sin\left(\sqrt{1 + x^2} - 1\right)}{x}$

(xvi) $\displaystyle\lim_{x\to 0} \frac{\sin(\pi \cos x)}{x \sin x}$

(xvii) $\displaystyle\lim_{n\to +\infty} \log^n\left(e + \frac{1}{n}\right)$

(xviii) $\displaystyle\lim_{x\to 0} \frac{\sqrt{1 + x + x^2} - 1}{x}$

(XIX) $\lim\limits_{n \to +\infty} \dfrac{2^{\sqrt{\log^2 n + \log(n^2)}}}{n^2 + 1}$

(XX) $\lim\limits_{x \to 0} \dfrac{\sin(\pi + 4x)}{x}$

(XXI) $\lim\limits_{x \to 0} \dfrac{(1 - \cos x)^2}{\log(1 + \sin^4 x)}$

(XXII) $\lim\limits_{n \to +\infty} \left(1 + \sin\left(\frac{1}{n}\right)\right)^{n + \sqrt{n}}$

(XXIII) $\lim\limits_{x \to \frac{\pi}{2}} \dfrac{\cos x}{1 - \sin x}$

(XXIV) $\lim\limits_{x \to 0^+} \dfrac{3^{\cos\frac{1}{x}} - 5}{x \log x}$