Tutorato 9 - ICA
Lunedì 6 Dicembre 2004
Fabrizio Araimo

a) Calcolare i seguenti limiti

1. $\displaystyle\lim_{x\to1^+}\frac{\log(1+\sqrt{x-1})}{\sqrt{x^2-1}}$
2. $\displaystyle\lim_{x\to0^+}(1+|\sin x|)^{1/x}$

3. $\displaystyle\lim_{x\to\infty}xe^x\sin\left(e^{-x}\sin\frac{2}{x}\right)$
4. $\displaystyle\lim_{x\to\frac{\pi}{2}}(1+\cos^2 x)^{\tan^2 x}$

5. $\displaystyle\lim_{x\to0}x\log x$
6. $\displaystyle\lim_{x\to0}\frac{\log\sin x}{\log x}$

7. $\displaystyle\lim_{x\to0}\frac{x^3-3x^2+4x}{x^5-x}$
8. $\displaystyle\lim_{x\to\infty}\frac{x^3-3x}{2x^3-x^2}$

3. $\displaystyle\lim_{x\to\infty}\frac{6x^4-x^2}{x-x^3}$
4. $\displaystyle\lim_{x\to0}\frac{\sin(\pi+4x)}{x}$

5. $\displaystyle\lim_{x\to0}\frac{\cos(\frac{\pi(1-x)}{2})}{x}$
6. $\displaystyle\lim_{x\to0}\frac{\sqrt{1+\tan x}-\sqrt{1-\tan x}}{\sin x}$

7. $\displaystyle\lim_{x\to\infty}(\sqrt{x}-1+\cos x)$
8. $\displaystyle\lim_{x\to\infty}x\sin\frac{1}{x}$

9. $\displaystyle\lim_{x\to\frac{\pi}{2}}(1+\cos^2 x)^{\tan^2 x}$
10. $\displaystyle\lim_{x\to0}(1+x)^{\tan x}$

11. $\displaystyle\lim_{x\to0}\frac{\log\cos x}{x^2}$
12. $\displaystyle\lim_{x\to\infty}\frac{\log(3+\sin x)}{x^3}$

13. $\displaystyle\lim_{x\to-\infty}\frac{3^x-3^{-x}}{3^x+3^{-x}}$
14. $\displaystyle\lim_{x\to5}\frac{x-5}{\sqrt{x}-\sqrt{5}}$

b) Calcolare i seguenti limiti usando lo sviluppo di Taylor:

1. $\displaystyle\lim_{x\to0}\frac{1-e^{-x^2}+x^3\sin(1/x)}{x^2}$
2. $\displaystyle\lim_{x\to0}\frac{x^2-\sin^2 x}{x^3(e^x-\cos x)}$

3. $\displaystyle\lim_{x\to0}\frac{\log(1+x)\arctan x-x\sin x}{\arctan x-1-\log(1+x)+\cos x}$
4. $\displaystyle\lim_{x\to0^+}\frac{\log(1-\cos 2x)}{\log\tan 2x}$

5. $\displaystyle\lim_{x\to0^+}\frac{\sqrt[4]{1+\sin^2 x}-1}{\log\left[1+\sqrt{1-e^{-x^2}}\right]\left[(1+\sin x)^{-1/x}-e^{-1}\right]}$

6. $\displaystyle\lim_{x\to0}\frac{(\arcsin x)^2+\log(1-\sin^2 x)}{\cosh x^2-1}$