Esercizi di Analisi Matematica - Limiti

1. Calcolare i seguenti limiti di funzioni:

(a) $\lim_{x\to+\infty}(\sqrt{x^2+2x+1}-x)$

(b) $\lim_{x\to1^+}\dfrac{\sin(1-x^2)}{\log(\sin\frac{\pi}{2}x)}$

(c) $\lim_{x\to0}\dfrac{e^x-e^{\sin x}}{x-\sin x}$

(d) $\lim_{x\to0}\dfrac{\sqrt{1+\tan x}-\sqrt{1-\tan x}}{\sin x}$

(e) $\lim_{x\to0^+}\dfrac{e^x+\sin x}{\log(1+x)}$

(f) $\lim_{x\to0}\dfrac{\log(x+2)-\log 2}{2^x-1}$

(g) $\lim_{x\to-\infty}(x+1)\sin\left(\dfrac{3x}{2x^2+1}\right)$

(h) $\lim_{x\to+\infty}\left(e^{\frac{1}{x}}\sqrt{x^2+x}-x\right)$

(i) $\lim_{x\to0^+}\dfrac{\log x}{\log(\sin x)}$

(j) $\lim_{x\to0^-}\dfrac{\sqrt[3]{x}-\sqrt[3]{\sin x}}{\sqrt{1-\cos x}}$

(k) $\lim_{x\to1}\dfrac{\log x}{x^2+3x-4}$

(l) $\lim_{x\to0}\dfrac{\sqrt{2}-\sqrt{1+\cos x}}{\sin^2 x}$

(m) $\lim_{x\to0^+}\dfrac{\log(e^x-1-x)}{\log(\arctan x)}$

(n) $\lim_{x\to0}\dfrac{\log(2-\cos x)}{\sin(x^2)}$

(o) $\lim_{x\to\frac{\pi}{2}}(\sin x)^{\tan x}$

(p) $\lim_{x\to0}\dfrac{\sin^2(2-\sqrt{4-x^2})}{1-\cos(3-\sqrt{9-x^2})}$

(q) $\lim_{x\to+\infty}x^2\left(\sqrt[4]{1+\dfrac{1}{\sqrt{x}}}-1\right)$

(r) $\lim_{x\to0}\dfrac{e^{x^2}-e^{-x^2}}{\log(1+\sin^2 x)}$

(s) $\lim_{x\to0}\dfrac{\log(1+x\sin x)-e^{x^2}+1}{1-\cos x-\log\left(1+\frac{x^2}{2}\right)}$

(t) $\lim_{x\to0}\dfrac{(1+\sin x)^{\frac{1}{\tan x}}}{\sqrt{\cos x}-1}$

(u) $\lim_{x\to+\infty}\left(1-\cos\dfrac{1}{x}\right)\log\left(\dfrac{1}{2}x^2\sin x+e^x\right)$

(v) $\lim_{x\to0}\dfrac{x+\log(1-x)}{1-\sqrt[3]{\cos x}}$

(w) $\lim_{x\to0}\dfrac{\sin 2x-2xe^{-\frac{2}{3}x^2+x^3}}{1-x^2-e^x+\sin x}$

(x) $\lim_{x\to0}\dfrac{(\cos x)3^x-e^x}{x}$

(y) $\lim_{x\to0}\dfrac{x^5e^{x^3}-\log(1+x^5)}{(\sqrt{1+x^4}-1)^2}$

(z) $\lim_{x\to0}\dfrac{\sin x-\log(1+x)-\frac{x^2}{2}}{\tan x(e^{x^2}-1)}$

(α) $\lim_{x\to0}\dfrac{\log(1+x-\sin x)\tan x}{(\sqrt{\cos x}-1)(2^{x^2}-1)}$