1 Limiti di funzioni

Calcolare i seguenti limiti

$$\lim_{x\to 0} \frac{x\sin^2 x - x^3}{5x\ln(1+x^4)} \quad \left[-\frac{1}{15}\right] \tag{1.1}$$

$$\lim_{x\to 1} \frac{(x^2+1)^2\sin(x-1)}{\sqrt{x}\ln x} \quad [4] \tag{1.2}$$

$$\lim_{x\to 2} \frac{e^{x-2}(x-2) - \sin(x-2)}{(x-2)^2} \quad [1] \tag{1.3}$$

$$\lim_{x\to 1} \sqrt{x}\frac{\sin^2(x-1)}{(x+1)^3\ln^2(x)} \quad \left[\frac{1}{8}\right] \tag{1.4}$$

$$\lim_{x\to 0} \frac{5\arctan x + 32x\sin^3 x}{1-\cos 2x + \sin 4x} \quad \left[\frac{5}{4}\right] \tag{1.5}$$

$$\lim_{x\to 0} \frac{\ln(1+x\arctan x) - e^{x^2} + 1}{\sqrt{1+2x^4}-1} \quad \left[-\frac{4}{3}\right] \tag{1.6}$$

$$\lim_{x\to 0} \frac{x\arcsin x - x^2}{\sqrt{1+x^4}-\cos x^2} \quad \left[\frac{1}{6}\right] \tag{1.7}$$

$$\lim_{x\to 0} \left(1+x^3\right)^{\frac{1}{x-\sin x}} \quad [e^6] \tag{1.8}$$

$$\lim_{x\to 0} \frac{x^5 e^{x^3} - \ln(1+x^5)}{\left[\sqrt{1+x^4}-1\right]^2} \quad [4] \tag{1.9}$$

$$\lim_{x\to 0^+} \frac{\cos\sqrt{x} - \cos x}{2x} \quad \left[-\frac{1}{4}\right] \tag{1.10}$$

$$\lim_{x\to 0^+} \frac{x+1}{x} - \frac{1}{\ln(x+1)} \quad \left[\frac{1}{2}\right] \tag{1.11}$$

$$\lim_{x\to 0^+} \frac{1}{x} - \frac{1}{\sin(x)} \quad [0] \tag{1.12}$$

Calcolare il limite della seguente funzione per $x \to 0$ e $x \to +\infty$

$$\frac{e^{-x} - \ln(1+x) - (x-1)^2}{x^3} \quad \left[-\frac{1}{2}, 0\right] \tag{1.13}$$