

Foglio n° 4
LIMITI DI FUNZIONI

Esercizio 1. Calcolare i seguenti limiti:

$$(1) \lim_{x \rightarrow 0} \frac{\sin 2x}{x};$$

$$(2) \lim_{x \rightarrow 0} \frac{\sin 2x}{\sin 3x};$$

$$(3) \lim_{x \rightarrow 0} \frac{e^{4x} - 1}{\sin x};$$

$$(4) \lim_{x \rightarrow 0} \frac{\sin^2 x}{\cos x - 1};$$

$$(5) \lim_{x \rightarrow 0} \frac{\sin(2x) - 2 \sin x}{x^3};$$

$$(6) \lim_{x \rightarrow 0} \frac{\sin(3x) + x}{\sin(2x) + \sin(4x)}.$$

$$(7) \lim_{x \rightarrow 0} \frac{e^{2x} - \log(x^2 + 2x + 1) - 1}{x};$$

$$(8) \lim_{x \rightarrow 0} \frac{(1 - \cos x)^2}{\log(1 + \sin^4 x)};$$

$$(9) \lim_{x \rightarrow 0} \frac{\log(1 + \tan x)}{e^{\sin x} - 1};$$

$$(10) \lim_{x \rightarrow 0} \frac{e^x - \sqrt[3]{1+x}}{\sin x};$$

$$(11) \lim_{x \rightarrow 1^+} \frac{e^{x^2-1} - 1}{\sqrt{\log x}};$$

$$(12) \lim_{x \rightarrow 1} \frac{(\sqrt{x} - 1)^3}{\sin(x - 1)};$$

$$(13) \lim_{x \rightarrow 0} \frac{\log(\cos x + x^3)}{x \sin x + x^5};$$

$$(14) \lim_{x \rightarrow 0} \frac{\cos(e^x - e^{-x}) - 1}{x \sin x};$$

$$(15) \lim_{x \rightarrow 0^+} x^x;$$

$$(16) \lim_{x \rightarrow 0^+} x^\alpha (\log x)^\beta, \text{ con } \alpha, \beta > 0.$$