

$$144. \lim_{x \rightarrow 0} (1 + 3 \operatorname{tg}^2 x)^{\operatorname{ctg}^2 x} = e^3$$

$$\left(\text{Si ponga: } \operatorname{tg}^2 x = \frac{1}{y} \right).$$

$$145. \lim_{x \rightarrow \frac{\pi}{2}} (1 + \cos x)^{3 \sec x} = e^3$$

$$\left(\text{Si ponga: } \cos x = \frac{1}{y} \right).$$

$$146. \lim_{x \rightarrow 0} \frac{e^{4x} - 1}{\operatorname{tg} x} = 4.$$

$$147. \lim_{x \rightarrow 0} \frac{\log(1 + 10x)}{x} = 10 \log e.$$

$$148. \lim_{x \rightarrow 0} \frac{\ln(1 + kx)}{x} = k.$$

$$149. \lim_{x \rightarrow +\infty} x[\log(x + 1) - \log x] = \log e.$$

$$150. \lim_{x \rightarrow +\infty} x[\ln(x + a) - \ln x] = a.$$

$$151. \lim_{x \rightarrow 0} \frac{\ln(a + x) - \ln a}{x} = \frac{1}{a}.$$

$$152. \lim_{x \rightarrow e} \frac{\ln x - 1}{x - e} = \frac{1}{e}$$

$$\left(\text{Si ponga: } x - e = y \text{ e } 1 = \ln e \right).$$

$$153. \lim_{x \rightarrow 0} \frac{e^{2x} - 1}{3x} = \frac{2}{3}$$

$$\left(\text{Si ponga: } 2x = y \right).$$

$$154. \lim_{x \rightarrow 1} \frac{e^x - e}{x - 1} = e$$

$$\left(\text{Si ponga: } x - 1 = y \right).$$

$$155. \lim_{x \rightarrow 0} \frac{e^{x^2} - \cos x}{x^2} = \frac{3}{2}$$

$$\left(\text{Aggiungere e togliere 1 al numeratore} \right).$$

$$156. \lim_{x \rightarrow 0} \frac{e^x - e^{-x}}{\operatorname{sen} x} = 2$$

$$\left(\text{Moltiplicare per } x \text{ numeratore e denominatore} \right).$$

$$157. \lim_{x \rightarrow 0} \frac{1 - e^{-x}}{\operatorname{sen} x} = 1.$$

Eseguire i seguenti esercizi riassuntivi sui limiti, dimostrando che si ha:

$$158. \lim_{x \rightarrow 0} \frac{\sqrt{x+4} - 2}{x} = \frac{1}{4}.$$

$$159. \lim_{x \rightarrow \infty} (\sqrt{x^2 + 2} - \sqrt{x^2 - 1}) = 0.$$

$$160. \lim_{x \rightarrow +\infty} (\sqrt{x^2 + 3x} - x) = \frac{3}{2}.$$

$$161. \lim_{x \rightarrow +\infty} \frac{1}{\sqrt{x^2 + x} - \sqrt{x^2 + 2}} = 2.$$

$$162. \lim_{x \rightarrow 2} \frac{\sqrt{2} - \sqrt{x}}{2 - x} = \frac{\sqrt{2}}{4}.$$

$$163. \lim_{x \rightarrow 1} \frac{\sqrt{x} - 1}{x^2 - 1} = \frac{1}{4}.$$

$$164. \lim_{x \rightarrow -1} \frac{\sqrt[3]{x} + 1}{x + 1} = \frac{1}{3}.$$

$$165. \lim_{x \rightarrow 1} \frac{\sqrt[3]{1 - x^2}}{\sqrt[3]{1 - x^3}} = \sqrt[3]{\frac{2}{3}}.$$

$$166. \lim_{x \rightarrow 1} \frac{x^3 - 1}{\sqrt{x} - 1} = 6.$$

$$167. \lim_{x \rightarrow 1} \frac{\sqrt{x+3} - \sqrt{3x+1}}{x-1} = -\frac{1}{2}.$$

$$168. \lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos x}{\operatorname{ctg} x} = 1.$$

$$169. \lim_{x \rightarrow \frac{\pi}{4}} \frac{\cos 2x}{\operatorname{sen} x - \cos x} = -\sqrt{2}.$$

$$170. \lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \operatorname{tg} x}{1 - \operatorname{ctg} x} = -1.$$

$$171. \lim_{x \rightarrow 0} \frac{\sqrt{1+x} - \sqrt{1-x}}{x} = 1.$$

$$172. \lim_{x \rightarrow \frac{\pi}{4}} [(1 - \operatorname{tg} x) \operatorname{tg} 2x] = 1.$$

$$174. \lim_{x \rightarrow \frac{\pi}{2}} \frac{1 - \operatorname{sen} x}{\cos x} = 0.$$

$$176. \lim_{x \rightarrow \pi} \frac{1 + \cos^3 x}{2 \cos^2 \frac{x}{2}} = 3.$$

$$178. \lim_{x \rightarrow 0} \frac{\cos ax - \cos bx}{\cos cx - \cos dx} = \frac{b^2 - a^2}{d^2 - c^2}.$$

$$180. \lim_{x \rightarrow a} \left(\operatorname{sen} \frac{x-a}{2} \cdot \operatorname{tg} \frac{\pi x}{2a} \right) = -\frac{a}{\pi}.$$

$$182. \lim_{x \rightarrow \frac{\pi}{2}} \left(2x \operatorname{tg} x - \frac{\pi}{\cos x} \right) = -2.$$

$$184. \lim_{\alpha \rightarrow \beta} \frac{\operatorname{sen}^2 \alpha - \operatorname{sen}^2 \beta}{\alpha^2 - \beta^2} = \frac{\operatorname{sen} 2\beta}{2\beta}.$$

$$186. \lim_{x \rightarrow \frac{\pi}{4}} \frac{\cos x - \operatorname{sen} x}{\cos 2x} = \frac{\sqrt{2}}{4}.$$

$$187. \lim_{x \rightarrow \frac{\pi}{6}} \frac{\operatorname{sen} \left(x - \frac{\pi}{6} \right)}{\frac{\sqrt{3}}{2} - \cos x} = 2 \quad \left(\text{Si ricordi che } \frac{\sqrt{3}}{2} = \cos \frac{\pi}{6} \text{ e che } x - \frac{\pi}{6} = 2 \cdot \frac{x - \frac{\pi}{6}}{2} \right).$$

$$188. \lim_{x \rightarrow 0} \frac{\ln(\cos x)}{x^2} = -\frac{1}{2}.$$

$$190. \lim_{x \rightarrow 0} \frac{e^{\operatorname{sen} 2x} - e^{\operatorname{sen} x}}{x} = 1.$$

$$192. \lim_{x \rightarrow 0} \left(\frac{\operatorname{sen} x}{x} \right)^{\frac{\operatorname{sen} x}{x - \operatorname{sen} x}} = \frac{1}{e}.$$

$$194. \lim_{x \rightarrow \infty} (\cos \sqrt{x+1} - \cos \sqrt{x}) = 0.$$

$$196. \lim_{x \rightarrow 0} \frac{\operatorname{sen}^2 x}{1 - \cos^3 x} = \frac{2}{3}.$$

$$198. \lim_{x \rightarrow a} \frac{\operatorname{sen} x - \operatorname{sen} a}{\operatorname{sen} \frac{x}{2} - \operatorname{sen} \frac{a}{2}} = \frac{2 \cos a}{\cos \frac{a}{2}}.$$

$$200. \lim_{x \rightarrow \frac{\pi}{2}} \frac{(1 - \operatorname{sen} x)^2}{\cos x} = 0.$$

$$202. \lim_{x \rightarrow \frac{\pi}{2}} \left(\frac{1 - \operatorname{sen}^5 x}{\cos^2 x} \right)^5 = \left(\frac{5}{2} \right)^5.$$

$$204. \lim_{x \rightarrow +\infty} \frac{\sqrt{x + \sqrt{x + \sqrt{x}}}}{\sqrt{x+1}} = 1.$$

$$173. \lim_{x \rightarrow \frac{\pi}{4}} \frac{\operatorname{tg} x - \operatorname{ctg} x}{\operatorname{sen} x - \cos x} = 2\sqrt{2}.$$

$$175. \lim_{x \rightarrow \frac{\pi}{2}} \frac{1 - \operatorname{sen}^3 x}{\cos^2 x} = \frac{3}{2}.$$

$$177. \lim_{x \rightarrow 0} \frac{1 - \cos x \sqrt{\cos 2x}}{x^2} = \frac{3}{2}.$$

$$179. \lim_{x \rightarrow 1} (1-x) \operatorname{tg} \frac{\pi x}{2} = \frac{2}{\pi}.$$

$$181. \lim_{x \rightarrow \pi} \frac{1 - \operatorname{sen} \frac{x}{2}}{\cos \frac{x}{2} \left(\cos \frac{x}{4} - \operatorname{sen} \frac{x}{4} \right)} = \frac{\sqrt{2}}{4}.$$

$$183. \lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos x}{\sqrt[3]{(1 - \operatorname{sen} x)^2}} = \infty.$$

$$185. \lim_{x \rightarrow 0} \operatorname{ctg} 2x \cdot \operatorname{ctg} \left(\frac{\pi}{2} - x \right) = \frac{1}{2}.$$

$$189. \lim_{x \rightarrow \infty} x(e^{\frac{1}{x}} - 1) = 1.$$

$$191. \lim_{x \rightarrow 0} \frac{e^{ax} - e^{bx}}{x} = a - b.$$

$$193. \lim_{x \rightarrow 0} (\cos x + \operatorname{sen} x)^{\frac{1}{x}} = e.$$

$$195. \lim_{x \rightarrow \infty} x^2 \left(1 - \cos \frac{1}{x} \right) = \frac{1}{2}.$$

$$197. \lim_{x \rightarrow \frac{\pi}{4}} \frac{\operatorname{tg} x - \operatorname{ctg} x}{\operatorname{sen}^2 x - \cos^2 x} = 2.$$

$$199. \lim_{x \rightarrow \frac{\pi}{4}} \frac{\operatorname{sen} 2x - 1}{\operatorname{sen} x - \sqrt{2}} = 0.$$

$$201. \lim_{x \rightarrow \frac{\pi}{2}} \frac{\operatorname{sen} x + \cos 2x}{1 + \operatorname{sen}^2 2x + \cos 2x} = \frac{1}{4}.$$

$$203. \lim_{x \rightarrow 3} \frac{\sqrt[5]{x^2 - 3} - \sqrt[5]{6}}{x - 3} = \frac{6}{5\sqrt[5]{6^4}}.$$

$$205. \lim_{x \rightarrow \frac{\pi}{3}} \frac{\operatorname{sen} \left(x - \frac{\pi}{3} \right)}{1 - 2 \cos x} = \frac{1}{\sqrt{3}}.$$