Calcolo e verifica di limiti di funzioni

indice

Gli esercizi sono proposti in ordine di difficoltà crescente.

nota: in un file così lungo e complesso può accadere che sia presente un errore di diversa natura nonostante gli esercizi siano stati controllati più volte. Saremo grati di ricevere segnalazioni di eventuali refusi o suggerimenti di qualsiasi natura.

calcola i seguenti limiti di forma determinata utilizzando la sostituzione e l'algebra classica

1	$\lim_{x\to 1}(x-1)$	0
2	$\lim_{x\to 0}(3-x)$	3
3	$\lim_{x\to 2}(2x+5)$	9
4	$\lim_{x\to -2}(2x+5)$	1
5	$\lim_{x\to 3}(2x+1)$	7
6	$\lim_{x\to 0}(1-3x)$	1
7	$\lim_{x\to -3}(5x-7)$	-22
8	$\lim_{x\to -4}(11x-14)$	-58
9	$\lim_{x\to 3}(x^2-2)$	7
10	$\lim_{x\to -1}(4-4x^2)$	0
11	$\lim_{x\to 0}(x^4-x^2)$	0
12	$\lim_{x\to 2}(2x^3+x^2-3x-1)$	13
13	$\lim_{x\to -1}(-x^3+2x^2-4)$	-1

14	$\lim_{x\to 10} \frac{2x+10}{6}$	5
15	$\lim_{x\to 2} \frac{1}{x}$	$\frac{1}{2}$
16	$\lim_{x\to -3} \frac{1}{x}$	$-\frac{1}{3}$
17	$\lim_{x\to -1} \frac{1}{x^4}$	1
18	$\lim_{x\to -3} \frac{x^2-1}{x-2}$	$-\frac{8}{5}$
19	$\lim_{x\to 2} \frac{2x^2-x-1}{3x-1}$	1
20	$\lim_{x\to 1} \frac{x^2-7x+1}{5x-2}$	$-\frac{5}{3}$
21	$\lim_{x\to 1} \frac{x^3-1}{x+5}$	0
22	$\lim_{x\to 2} \frac{4-x^2}{x^3+2x^2-3x-4}$	0
23	$\lim_{x\to 3} \frac{x^4-6x^3-3}{x^3-3}$	$-\frac{7}{2}$
24	$\lim_{x\to 2} \sqrt{12+x^2}$	4
25	$\lim_{x\to 3} \frac{3-x^2}{\sqrt{3}-x}$	$\sqrt{3}+3$
26	$\lim_{x\to 4} \sqrt{2x+1}$	3

27	$\lim_{x\to 0} e^x$	1
28	$\lim_{x\to 0} \ln\frac{x+3}{2x+1}$	$\ln 3$
29	$\lim_{x\to 3}\left(\frac{3+x}{x+2}\right)^{x-3}$	1
30	$\lim_{x\to 0} \log_2\sqrt{\left(\frac{1}{3}\right)^x+3}$	1
31	$\lim_{x\to 0} \frac{e^{x+3}}{e^{-x}+e^x}$	$\frac{e^3}{2}$
32	$\lim_{x\to 0}\sqrt{\frac{3^x+2}{\left(\frac{1}{3}\right)^x+1}}$	$\frac{\sqrt{6}}{2}$
33	$\lim_{x\to 0} \frac{3^x+1}{\log_3(x+3)}$	2
34	$\lim_{x\to 1} (e^{2x-1}-e)$	0
35	$\lim_{x\to 0} \frac{e^{\sin x}-1}{\cos x+2}$	0
36	$\lim_{x\to\frac{\pi}{2}} \sin x+\cos x$	1
37	$\lim_{x\to\pi} \frac{\cos x+2}{\sqrt{\sin x+4}}$	π
38	$\lim_{x\to\frac{\pi}{6}} \frac{\tan x\cos x}{2}$	$\frac{1}{4}$

calcola i seguenti limiti di forma determinata utilizzando anche l'algebra dei limiti, i grafici e i limiti delle funzioni elementari

39	$\lim_{x\to+\infty}(4x-7)$	$+\infty$
40	$\lim_{x\to-\infty}(5x-1)$	$-\infty$
41	$\lim_{x\to0}\frac{1}{x^4}$	$+\infty$
42	$\lim_{x\to1^+}\frac{x+5}{x^3-1}$	$+\infty$
43	$\lim_{x\to1}\frac{x^2+x+1}{x^2-2x+2}$	3
44	$\lim_{x\to\frac{1}{4}^+}\frac{6x^2-2x+1}{4x-1}$	$+\infty$
45	$\lim_{x\to\frac{1}{4}^+}\frac{6x^2-2x+1}{1-4x}$	$-\infty$
46	$\lim_{x\to-1^+}\frac{3}{x+1}$	$+\infty$
47	$\lim_{x\to-\infty}\left(x+\frac{3}{x}\right)$	$-\infty$
48	$\lim_{x\to-\infty}\frac{1}{9-6x}$	0
49	$\lim_{x\to2}\frac{2x^2-x+1}{2^{2x}-2^x+2}$	$\frac{1}{2}$

50	$\lim_{x\to-\infty} e^{x-\pi} - 62$	0
51	$\lim_{x\to-\infty} e^{x+5}$	0
52	$\lim_{x\to1^+} \frac{5}{3^x - 3}$	$+\infty$
53	$\lim_{x\to-\infty} (e^{x+2} + e^{2x})$	0
54	$\lim_{x\to+\infty} \left(\frac{1}{5}\right)^{x+3}$	0
55	$\lim_{x\to+\infty} \frac{e^x + e^{-x}}{3e^{-x}}$	$+\infty$
56	$\lim_{x\to3^+} log_{\frac{2}{3}}(x-3)$	$+\infty$
57	$\lim_{x\to-3} log_3(6-x)$	2
58	$\lim_{x\to+\infty} ln\left(1+\frac{3}{x}\right)$	0
59	$\lim_{x\to+\infty} \sqrt{ln\left(1+\frac{5}{x}\right)}$	0
60	$\lim_{x\to1} \frac{2x-1}{log_2 x - 2}$	$-\frac{1}{2}$

61	$\lim_{x\to\frac{\pi}{6}} \left(2\cos x - \sqrt{3}\right)$	0
62	$\lim_{x\to\frac{\pi}{2}^-} \frac{2\sin x + 3}{2\cos x}$	$+\infty$
63	$\lim_{x\to\frac{\pi}{2}} \frac{\sin x + 2\cos x}{2x}$	$\frac{1}{\pi}$
64	$\lim_{x\to\pi^-} \frac{2\cos x + 1}{\sin x}$	$-\infty$
65	$\lim_{x\to 0^+} \left(\frac{3\sin x}{\ln 3x} + \frac{2}{\cos 2x}\right)$	2
66	$\lim_{x\to\frac{\pi}{2}} \frac{5\sin x + 1}{2\tan x - 1}$	0
67	$\lim_{x\to\frac{\pi}{4}^+} \frac{8\cos x + 2\sin x}{\cot x - 1}$	$-\infty$
68	$\lim_{x\to\frac{\pi}{2}} \frac{4\cos x - 2\sin x}{-\cot 2x}$	0
69	$\lim_{x\to 0^+} (2\cos x - \sin x + 2\tan x - \cot x)$	$-\infty$
70	$\lim_{x\to\frac{3}{2}\pi} \frac{4\sqrt{\cos x} + 2\sqrt{\cot x}}{5\tan x - 1}$	0
71	$\lim_{x\to\frac{\pi}{2}^+} \frac{5\cos x - 2\tan x + \sin x}{\sqrt[3]{4\sin x - 4}}$	$-\infty$
72	$\lim_{x\to-\infty} \log_5 \sin(2^x + \pi)$	$-\infty$

esercizi di riepilogo di limiti che si presentano in forma determinata

73	$\lim_{x\to+\infty} \frac{7}{1+x}$	0
74	$\lim_{x\to0} \left(\frac{4}{x^4}+\frac{2}{x^2}\right)$	$+\infty$
75	$\lim_{x\to3^+} \frac{3x-5}{3-x}$	$-\infty$
76	$\lim_{x\to-2^+} \frac{x}{x+2}$	$-\infty$
77	$\lim_{x\to-2^-} \frac{x}{x+2}$	$+\infty$
78	$\lim_{x\to\frac{3}{2}} \frac{x-3}{(2x-3)^2}$	$-\infty$
79	$\lim_{x\to0^+} \left(\frac{1}{x^4}-\frac{1}{x^5}\right)$	$+\infty$
80	$\lim_{x\to4} \frac{log_2 x+2}{4\,log_4 x}$	1
81	$\lim_{x\to3^+} \frac{ln(x-3)}{2-x}$	$+\infty$
82	$\lim_{x\to2} \sqrt{2x+log_2 x}$	$\sqrt{5}$
83	$\lim_{x\to3} cos\left(\frac{log_3 x-1}{x+2}\right)$	1
84	$\lim_{x\to0^+} \left(lnx-\frac{1}{4x^4}\right)$	$-\infty$

85	$\lim_{x\to 2} \frac{log(x^2+x-5)}{2^x-1}$	0
86	$\lim_{x\to 3} \frac{log_3 x + 3\, log_3 \frac{3}{x}}{x-2}$	1
87	$\lim_{x\to 1} 3\, log_3(1-3\, log_3 x)$	0
88	$\lim_{x\to 0^+} \frac{5x+1}{5^x-1}$	$+\infty$
89	$\lim_{x\to -\infty} \frac{e^{2x}}{2x}$	0
90	$\lim_{x\to 0^+} \frac{3^x lnx}{2+3x}$	$-\infty$
91	$\lim_{x\to +\infty} (-x\, 2^x lnx)^2$	$+\infty$
92	$\lim_{x\to +\infty} \left(\frac{lnx}{e^{-x}} + \frac{3}{x}\right)$	$+\infty$
93	$\lim_{x\to 1^-} \left(\frac{3^x}{lnx} + \frac{3}{x-1}\right)$	$-\infty$
94	$\lim_{x\to +\infty} \left(log_{\frac{1}{2}} x - 3xe^x\right)$	$-\infty$
95	$\lim_{x\to 0^+} \frac{3\, log_2 x}{-2x}$	$+\infty$
96	$\lim_{x\to \left(\frac{\pi}{2}\right)^-} e^{-\frac{5}{cosx}}$	0^+

97	$\lim_{x\to+\infty} (\ln 2x)^x$	$+\infty$
98	$\lim_{x\to\pi} \frac{e^{\cos x} + 3\sin x}{\sqrt{1+3\tan x}}$	$\frac{1}{e}$
99	$\lim_{x\to0^+} \left(\ln\frac{3}{x}\right)^{e^{\frac{3}{x}}}$	$+\infty$
100	$\lim_{x\to\left(\frac{\pi}{2}\right)^+} e^{-\frac{3}{\cos x}}$	$+\infty$
101	$\lim_{x\to1^-} \left(\frac{3}{1-x}\right)^{x-3}$	0^+
102	$\lim_{x\to-\infty} (x^2+3)^{x^2}$	$+\infty$
103	$\lim_{x\to0} \frac{\arctan x + 2x}{2\cos x}$	0
104	$\lim_{x\to1^-} 2\ln\arccos x$	$-\infty$
105	$\lim_{x\to0^+} \arctan\ln 2x$	$-\frac{\pi}{2}$
106	$\lim_{x\to1^-} \frac{2\arcsin x}{x-1}$	$-\infty$
107	$\lim_{x\to1^+} \frac{\ln 3\arctan(x-1)}{3x}$	$-\infty$
108	$\lim_{x\to1^+} \left[\frac{1+2\cos(x-1)}{4}\right]^{\frac{2}{1-x}}$	$+\infty$

109	$\lim_{x\to -1^+} \frac{2}{tan\, ln(x+2)}$	$+\infty$
110	$\lim_{x\to 3^+} \left[\frac{ln(x-3)}{\sqrt[3]{3-x}} - \frac{1}{3-x}\right]$	$+\infty$
111	$\lim_{x\to 2^+} \left(\frac{x}{3x-1}\right)^{\frac{1}{ln(x-2)}}$	1
112	$\lim_{x\to -\infty} \frac{ln(1+e^{2x})}{ln(1-x)}$	0
113	$\lim_{x\to 2^+} \left(\frac{1}{\sqrt{x-2}}\right)^{x-3}$	0
114	$\lim_{x\to -\infty} \frac{3^x}{(x^2-x)ln(3-x)}$	0
115	$\lim_{x\to 3^+} \left(\frac{x-3}{e^{x-3}}\right)^{\frac{1}{x-3}}$	0
116	$\lim_{x\to +\infty} (3^x-3)^{arctan(3-x)}$	0
117	$\lim_{x\to 0^+} 2x^{\frac{2}{x}}$	0^+
118	$\lim_{x\to 0} (1-cos\, x)^{\frac{2}{x^2}}$	0^+
119	$\lim_{x\to 0^+} \left(\frac{2}{sin\, x}\right)^{-\frac{2}{sin\, x}}$	0^+
120	$\lim_{x\to 0^+} \left[log_3(cosx) + \frac{3}{x}\right]$	$+\infty$

calcola i seguenti limiti di polinomi nella forma indeterminata $+\infty - \infty$

121	$\lim_{x\to+\infty} (x^2 - 2x)$	$+\infty$
122	$\lim_{x\to-\infty} (3x^2 + 22x - 1)$	$+\infty$
123	$\lim_{x\to-\infty} (2x^3 + x^2 - 5x - 6)$	$-\infty$
124	$\lim_{x\to-\infty} (6x^7 - 5x - 8)$	$-\infty$
125	$\lim_{x\to+\infty} (x^2 - 2x^3 + 5x - x^6)$	$-\infty$
126	$\lim_{x\to-\infty} (x - 5x^2 + 1)$	$-\infty$
127	$\lim_{x\to-\infty} \left(\frac{4}{3}x - \frac{1}{4}x^2 + \frac{2}{5}x^3 - \frac{1}{4}\right)$	$-\infty$
128	$\lim_{x\to+\infty} \left(\frac{4x^4 - 5x + 2}{6}\right)$	$+\infty$
129	$\lim_{x\to-\infty} \left(-\frac{\sqrt{3}\,x^2 - 4x^3 + 2x - 1}{4}\right)$	$-\infty$
130	$\lim_{x\to-\infty} \left(\frac{\sqrt{2}\,x^2 + 2x - x^3 + 2x^2}{-24}\right)$	$-\infty$
131	$\lim_{x\to-\infty} (x^4 + 2x^5 - 3x + 8)^2$	$+\infty$
132	$\lim_{x\to+\infty} (x^4 - 2x^5 - 3x)^5$	$-\infty$

calcola i seguenti limiti di rapporto di polinomi nella forma indeterminata ∞/∞

133	$\lim_{x\to+\infty} \frac{x^2+2x-8}{2-5x}$	$-\infty$
134	$\lim_{x\to+\infty} \frac{6\,x^2+3x-5}{3x^2+12}$	2
135	$\lim_{x\to+\infty} \frac{2x^3-x^2+3}{2-3x^3}$	$-\frac{2}{3}$
136	$\lim_{x\to+\infty} \frac{x+2}{2x^2-5}$	0
137	$\lim_{x\to+\infty} \frac{3x^2+2x^4-5}{2x^2+5x+6}$	$+\infty$
138	$\lim_{x\to+\infty} \frac{x^2-3x^4-10}{-3x^2+4x^5-9}$	0
139	$\lim_{x\to+\infty} \frac{ln2\,x^2+5x-1}{2x^2-5}$	$\frac{ln2}{2}$
140	$\lim_{x\to+\infty} \frac{x^4-5}{-3x^4+5x^3+x^2-2x+1}$	$-\frac{1}{3}$
141	$\lim_{x\to-\infty} \frac{3x^4+5}{x^3+3x-2}$	$-\infty$
142	$\lim_{x\to-\infty} \frac{-x^3-6x^2-5x+4}{3x^2-8x}$	$+\infty$
143	$\lim_{x\to\infty} \frac{-5x^5+2}{-x^4-3x^5+7x^3-6x+1}$	$\frac{5}{3}$
144	$\lim_{x\to+\infty} \frac{3x^2+2x^4-5x^5+2}{4x^2-2x^5+6x^3-6}$	$\frac{5}{2}$
145	$\lim_{x\to-\infty} \frac{x^3+1}{-x^2+x+3}$	$+\infty$

146	$\lim_{x\to\infty} \frac{2x^2+9}{\sqrt{2}x^2+3x-6}$	$\sqrt{2}$
147	$\lim_{x\to\infty} \frac{x^3+2x^2-x+1}{-x^4+2x^3-5x+12}$	0
148	$\lim_{x\to+\infty} \frac{5x^3-2x+1}{-3x^3+4x^2-x-1}$	$-\frac{5}{3}$
149	$\lim_{x\to+\infty} \frac{4x^2+2x^7-3x+2}{-3x^2+5x^8+6x-4}$	0
150	$\lim_{x\to+\infty} \frac{2x^2-x-3}{2\sqrt{x}-4x^3}$	0
151	$\lim_{x\to\infty} \frac{2x^4+3}{5x^2-7x^4}$	$-\frac{2}{7}$
152	$\lim_{x\to+\infty} \frac{6x^3-x^2+4x-2}{3x^2+25x-1}$	$+\infty$
153	$\lim_{x\to+\infty} \frac{-x^2+2x-2}{2x^3+5x-3}$	0
154	$\lim_{x\to+\infty} \frac{x^2-4x^5+2x-6}{2x^2+x-4x^5+2x^3-82}$	1
155	$\lim_{x\to-\infty} \frac{5x^7+4x^2+6x^6-2}{x^4-x^3+4x^5+1}$	$+\infty$
156	$\lim_{x\to+\infty} \frac{2x^2+5x^3-6x^4-5}{-6x^3-4x^5+6x^4-1}$	0
157	$\lim_{x\to5} \left(\frac{1}{x-5}-\frac{10}{x^2-25}\right)$	$\frac{1}{10}$
158	$\lim_{x\to3} \left(\frac{1}{x-3}-\frac{6}{x^2-9}\right)$	$\frac{1}{6}$

calcola i seguenti limiti di rapporto di polinomi nella forma indeterminata 0/0

159	$\lim_{x\to 1} \frac{x^2-1}{x-1}$	2
160	$\lim_{x\to -3^-} \frac{2x+6}{x^2+x-6}$	$-\frac{2}{5}$
161	$\lim_{x\to 1} \frac{1-x}{x^2-4x+3}$	$\frac{1}{2}$
162	$\lim_{x\to -2^+} \frac{x^2-4}{x^2+4x+4}$	$-\infty$
163	$\lim_{x\to 5} \frac{-x^2+10x-25}{x^2-7x+10}$	0
164	$\lim_{x\to 1} \frac{x-1}{x^3-4x^2+4x-1}$	-1
165	$\lim_{x\to \sqrt{3}} \frac{3-x^2}{\sqrt{3}-x}$	$2\sqrt{3}$
166	$\lim_{x\to 2^+} \frac{x^2-4}{x^2-4x+4}$	$+\infty$
167	$\lim_{x\to \sqrt{2}} \frac{x^2-2}{2\sqrt{2}-x^3}$	$-\frac{\sqrt{2}}{3}$
168	$\lim_{x\to 2} \frac{x^2-4}{8-x^3}$	$-\frac{1}{3}$
169	$\lim_{x\to 2} \frac{x^2-5x+6}{x^2-4}$	$-\frac{1}{4}$
170	$\lim_{x\to 1^-} \frac{\sqrt{x^2+2x-3}}{x-1}$	$-\infty$

171	$\lim_{x\to -2} \frac{4-x^2}{x^4-16}$	$-\frac{1}{8}$
172	$\lim_{x\to 2} \frac{x^3-8}{x-2}$	12
173	$\lim_{x\to -\sqrt{2}} \frac{x^4-4}{x+\sqrt{2}}$	$-8\sqrt{2}$
174	$\lim_{x\to 1} \frac{x-1}{\sqrt{x^2+2x-3}}$	0
175	$\lim_{x\to -3} \frac{x^3-8x+3}{x^2+8x+15}$	$\frac{19}{2}$
176	$\lim_{x\to 3} \frac{\sqrt{x^2-9}}{\sqrt{x-3}}$	$\sqrt{6}$
177	$\lim_{x\to -2} \frac{x^4-3x^2+5x+6}{x^3-3x^2-8x+4}$	$-\frac{15}{16}$
178	$\lim_{x\to -1} \frac{x^3-x}{x^3-x^2+x+3}$	$\frac{1}{3}$
179	$\lim_{x\to 3} \frac{3-x}{\sqrt[3]{30-x}-3}$	27
180	$\lim_{x\to \frac{1}{4}} \frac{4x^3-13x^2+7x-1}{8x^3-6x^2+9x-2}$	$\frac{1}{6}$
181	$\lim_{x\to 2} \frac{x^3-2x^2-x+2}{x^2-4}$	$\frac{3}{4}$
182	$\lim_{x\to 2} \frac{x^3-7x+6}{x^3+2x^2-13x+10}$	$\frac{5}{7}$
183	$\lim_{x\to 3} \frac{x^4-6x^3+10x^2-6x+9}{x^4-4x^3-2x^2+12x+9}$	$\frac{5}{8}$

calcola i seguenti limiti di funzioni irrazionali di una delle forme indeterminate $+\infty-\infty$ ∞/∞ $0/0$

184	$\lim_{x\to+\infty}\left(\sqrt{x^2-5x}-x\right)$	$-\frac{5}{2}$
185	$\lim_{x\to-\infty}\left(\sqrt{x^2+x}+x\right)$	$-\frac{1}{2}$
186	$\lim_{x\to+\infty}\left(\sqrt{x^2+3}-x\right)$	0
187	$\lim_{x\to+\infty}\left(3x-\sqrt{9x^2-7}\right)$	0
188	$\lim_{x\to-\infty}\left(x+\sqrt{x^2+x+3}\right)$	$-\frac{1}{2}$
189	$\lim_{x\to+\infty}\left(\sqrt{x^2+6x+7}-x\right)$	3
190	$\lim_{x\to-\infty}\left(\sqrt{4+x^2}+x\right)$	0
191	$\lim_{x\to+\infty}\left(\sqrt{3x+1}-\sqrt{x+2}\right)$	$+\infty$
192	$\lim_{x\to+\infty}\left(\sqrt{x^2-x+1}-\sqrt{x^2-4x-2}\right)$	$\frac{3}{2}$
193	$\lim_{x\to+\infty}\left(\sqrt{x^6-4x+11}-x^3\right)$	0
194	$\lim_{x\to-\infty}\left(\sqrt{x^2-3}-\sqrt{x^2+5x-6}\right)$	$\frac{5}{2}$
195	$\lim_{x\to+\infty}\left(\sqrt[3]{x+1}-\sqrt[3]{x-3}\right)$	0
196	$\lim_{x\to+\infty}\left(\sqrt{x^2-3x}-\sqrt{x^2-5x+1}\right)$	1

197	$\lim_{x\to+\infty} \frac{3x-2}{\sqrt{2x+1}}$	$+\infty$
198	$\lim_{x\to+\infty} \frac{3x-2}{\sqrt{2x^2+1}}$	$\frac{3\sqrt{2}}{2}$
199	$\lim_{x\to+\infty} \frac{\sqrt{x^2+2}}{3x-1}$	$\frac{1}{3}$
200	$\lim_{x\to+\infty} \frac{2x+3}{\sqrt{x^2+3}}$	2
201	$\lim_{x\to-\infty} \frac{1}{x+\sqrt{x^2+2}}$	$+\infty$
202	$\lim_{x\to+\infty} \frac{2}{\sqrt{x^2+3}-x}$	$+\infty$
203	$\lim_{x\to+\infty} \frac{\sqrt{3x^2-1}+2x}{-7x-2}$	$-\frac{\sqrt{3}+2}{7}$
204	$\lim_{x\to+\infty} \frac{x+\sqrt{x^2+5}}{\sqrt[3]{5x^3+4x+3}}$	$\frac{2\sqrt[3]{25}}{5}$
205	$\lim_{x\to+\infty} \frac{x+\sqrt{x^2+5}}{\sqrt[3]{20x^4+3}}$	0
206	$\lim_{x\to+\infty} \frac{\sqrt{x}+\sqrt[3]{x}}{2+\sqrt{x}}$	1
207	$\lim_{x\to+\infty} \frac{2x+\frac{3}{5}}{\sqrt{2x^2+1}}$	$\sqrt{2}$

208	$\lim_{x\to 0} \frac{\sqrt{x+9}-3}{4x}$	$\frac{1}{24}$
209	$\lim_{x\to -3} \frac{x^2-9}{\sqrt{9+x}}$	0
210	$\lim_{x\to -3} \frac{\sqrt{9-x^2}}{\sqrt{1-x}-2}$	$-\infty$
211	$\lim_{x\to 1} \frac{\sqrt{x^2+2x+6}-3x}{x^2-5x+4}$	$\frac{7}{9}$
212	$\lim_{x\to 2} \frac{5-\sqrt{8x+9}}{x^2-3x+2}$	$-\frac{4}{5}$
213	$\lim_{x\to 1^+} \frac{\sqrt{x^2-1}}{\sqrt{x}-1}$	$+\infty$
214	$\lim_{x\to 0} \frac{\sqrt{2x+1}-\sqrt{3x+1}}{\sqrt{x^2+16}-2\sqrt{x+4}}$	1
215	$\lim_{x\to 0} \frac{\sqrt{1+x}-\sqrt{1-x}}{x}$	1
216	$\lim_{x\to 4} \frac{\sqrt{x}-2}{x^3-64}$	$\frac{1}{192}$
217	$\lim_{x\to 1} \frac{\sqrt{x+1}-\sqrt{2}}{\sqrt{x+8}-3}$	$\frac{3\sqrt{2}}{2}$
218	$\lim_{x\to 1} \frac{\sqrt{x^2-x+9}-\sqrt{x^2+3x+5}}{x^2+3x-4}$	$-\frac{2}{15}$
219	$\lim_{x\to 2} \frac{\sqrt{x^2+2x-4}-\sqrt{x^2+3x-6}}{x^2-4}$	$-\frac{1}{16}$

esercizi di riepilogo di limiti di funzioni che si possono risolvere senza far uso dei limiti notevoli

220	$\lim_{x\to+\infty}(x^2+2x+3)$	$+\infty$
221	$\lim_{x\to-9}\sqrt{\lvert x\rvert}$	3
222	$\lim_{x\to-4}\sqrt{\lvert x\rvert}$	2
223	$\lim_{x\to-\infty}(4x^4-3x^2+5x-5)$	$+\infty$
224	$\lim_{x\to0}\lvert x-1\rvert$	1
225	$\lim_{x\to-\infty}\frac{\sqrt{4x^2+1}}{3x-5}$	$-\frac{2}{3}$
226	$\lim_{x\to+\infty}(2x^2-4x^3-x+22)$	$-\infty$
227	$\lim_{x\to3}\frac{2x^2-5x-3}{x^3-3x^2+x-3}$	$\frac{7}{10}$
228	$\lim_{x\to1}\frac{x^2-1}{x^3-1}$	$\frac{2}{3}$
229	$\lim_{x\to2}(5x^2+2x-20)^2$	16
230	$\lim_{x\to-\infty}e^x$	0
231	$\lim_{x\to1}\frac{2x+3}{3x+4}$	$\frac{5}{7}$

232	$\lim_{x\to+\infty} \frac{x^3-1}{1-2x^2}$	$+\infty$
233	$\lim_{x\to1} \frac{x^2-5x+4}{x^2-3x+2}$	3
234	$\lim_{x\to3} \sqrt{5x+10}$	5
235	$\lim_{x\to-\infty} \frac{x^3+2x^2-3x}{2x^2-3x+1}$	$-\infty$
236	$\lim_{x\to5} \frac{2x-1-\sqrt{4x^2-2x-9}}{x-5}$	$-\frac{1}{9}$
237	$\lim_{x\to-\infty} \left(\sqrt{x^2-x-2}-\sqrt{x^2-2x+3}\right)$	$-\frac{1}{2}$
238	$\lim_{x\to\frac{1}{4}^+} log_{\frac{1}{3}} \frac{2x+1}{4x-1}$	$-\infty$
239	$\lim_{x\to+\infty} \frac{2x^2-3x-2}{-3x^2+5x+6}$	$-\frac{2}{3}$
240	$\lim_{x\to\pi} \frac{\sin x}{x}$	0
241	$\lim_{x\to+\infty} \left(\sqrt{x+5}-\sqrt{x-3}\right)$	0
242	$\lim_{x\to+\infty} \frac{4x^2+x-14}{2x^2+11x-2}$	2
243	$\lim_{x\to2} \frac{2x^2-3x-2}{ln\,(2x-3)}$	$\frac{5}{2}$

244	$\lim_{x\to+\infty} \left(\sqrt[3]{x-1} - \sqrt[3]{2x}\right)$	$-\infty$
245	$\lim_{x\to-\infty} (-2x^5 - x^4 + 2x - 10)^3$	$+\infty$
246	$\lim_{x\to1^-} e^{\frac{1}{x-1}}$	0
247	$\lim_{x\to+\infty} \frac{1}{\sqrt{x^2-x-2} - \sqrt{x^2-2x-3}}$	2
248	$\lim_{x\to2} \frac{\sqrt[3]{10-x} - 2}{x-2}$	$-\frac{1}{12}$
249	$\lim_{x\to0^-} \frac{2x+3}{\sin x}$	$-\infty$
250	$\lim_{x\to-\infty} \arctan \frac{x^3+5}{x^2-2x}$	$-\frac{\pi}{2}$
251	$\lim_{x\to0} \tan\lvert -3x \rvert$	0
252	$\lim_{x\to2} \log_{\frac{1}{4}} \log_3(x-1)$	$+\infty$
253	$\lim_{x\to+\infty} \sqrt{6x-35}$	$+\infty$
254	$\lim_{x\to+\infty} e^{x+2} + 2$	$+\infty$
255	$\lim_{x\to+\infty} \arctan \frac{2x^3+1}{x^2}$	$\frac{\pi}{2}$
256	$\lim_{x\to1} \frac{\sqrt[3]{x} - 1}{x-1}$	$\frac{1}{3}$
257	$\lim_{x\to+\infty} \left(\sqrt{3+2x} - \sqrt{4+2x}\right)$	0

calcola i seguenti limiti utilizzando i limiti notevoli delle funzioni goniometriche

258	$\lim_{x\to 0} \frac{\sin 5x}{\sin 2x}$	$\frac{5}{2}$
259	$\lim_{x\to 0} \frac{2x+\sin 3x}{4x+\sin 7x}$	$\frac{5}{11}$
260	$\lim_{x\to 0} \frac{\sin(x^2-5x)}{\sin 3x}$	$-\frac{5}{3}$
261	$\lim_{x\to 0} \frac{1-\cos^3 x}{5x \sin x}$	$\frac{3}{10}$
262	$\lim_{x\to 0} \frac{1-\cos x}{4 \sin\frac{x}{2}\ tanx}$	$\frac{1}{4}$
263	$\lim_{x\to 0} \frac{1-\cos 3x}{\sin^2 2x}$	$\frac{9}{8}$
264	$\lim_{x\to 0} \frac{\tan^2 3x}{1-\cos x}$	18
265	$\lim_{x\to 0^+} \frac{\sqrt{1-\cos x}}{5x}$	$\frac{\sqrt{2}}{10}$
266	$\lim_{x\to 0} \frac{1-\cos 3x}{x \sin x}$	$\frac{9}{2}$
267	$\lim_{x\to 0} \frac{\sin^2 x}{5x\ tanx}$	$\frac{1}{5}$
268	$\lim_{x\to 0} \frac{2x^2}{1-\cos^3 x}$	$\frac{4}{3}$
269	$\lim_{x\to 0} \frac{7\sin x}{x+tanx}$	$\frac{7}{2}$

270	$\lim_{x\to 0} \frac{\cos x - 1}{4\tan^2 x}$	$-\frac{1}{8}$
271	$\lim_{x\to 4} \frac{\sin(4-x)}{16-x^2}$	$\frac{1}{8}$
272	$\lim_{x\to 0} \frac{\sin\frac{x}{2}}{x}$	$\frac{1}{2}$
273	$\lim_{x\to 0} \frac{\tan x}{3x}$	$\frac{1}{3}$
274	$\lim_{x\to 0} \frac{1-\cos x}{x}$	0
275	$\lim_{x\to 0} \frac{\sin 2x}{x\cos x}$	2
276	$\lim_{x\to 0} \frac{3\sin x + 2x}{x}$	5
277	$\lim_{x\to 0} \frac{\sin 3x}{\sin 5x}$	$\frac{3}{5}$
278	$\lim_{x\to 0} \frac{\sin^2 x}{1-\cos x}$	2
279	$\lim_{x\to 0} \frac{2\sin x + 3x - 4x^2}{3\sin x - x}$	$\frac{5}{2}$
280	$\lim_{x\to 0^+} \frac{\sqrt{1-\cos x}}{x}$	$\frac{\sqrt{2}}{2}$

281	$\lim_{x\to 0} \frac{1-\cos^3 x}{x \sin x}$	$\frac{3}{2}$
282	$\lim_{x\to 0} \frac{arcsin\, 6x}{arctan\, 5x}$	$\frac{6}{5}$
283	$\lim_{x\to 0} \frac{x\, arctan\, 2x}{1-cos\, 3x}$	$\frac{4}{9}$
284	$\lim_{x\to 0} \frac{3arcsinx + 2arctanx}{sinx + 5x}$	$\frac{5}{6}$
	calcola i seguenti limiti effettuando un cambio di variabile	
285	$\lim_{x\to -4} \frac{tan\, \pi x}{x+4}$	π
286	$\lim_{x\to \frac{\pi}{2}} \frac{1-sin\, x}{cos\, x}$	0
287	$\lim_{x\to -\frac{\pi}{4}} \frac{sin\, x + cos\, x}{cos\, 2x}$	$\frac{\sqrt{2}}{2}$
288	$\lim_{x\to \pi} \frac{1+\cos^3 x}{2\, cos^2 \frac{x}{2}}$	3
289	$\lim_{x\to \pi} \frac{sin\, x + sin^3 x}{x-\pi}$	-1
290	$\lim_{x\to \frac{\pi}{2}} \frac{5\, sin^2 x + sin\, x\ -6}{\left(x-\frac{\pi}{2}\right)}$	0
291	$\lim_{x\to \frac{\pi}{4}} \frac{sin\, x - cos\, x}{tan\left(\frac{\pi}{8}-\frac{x}{2}\right)}$	$-2\sqrt{2}$

calcola i seguenti limiti utilizzando i limiti notevoli delle funzioni esponenziali e logaritmiche

292	$\lim_{x\to\infty}\left(1+\frac{1}{x}\right)^{3x}$	e^3
293	$\lim_{x\to\infty}\left(1+\frac{1}{2x}\right)^{x}$	$\sqrt{e}$
294	$\lim_{x\to 0}\left(1-\frac{x}{3}\right)^{-\frac{5}{x}}$	$\sqrt[3]{e^5}$
295	$\lim_{x\to\infty}\left(1+\frac{1}{x}\right)^{3x-2}$	e^3
296	$\lim_{x\to\infty}\left(1-\frac{2}{x}\right)^{x}$	$\frac{1}{e^2}$
297	$\lim_{x\to 0}\left(1-\frac{2x}{3}\right)^{-\frac{1}{x}}$	$e^{\frac{2}{3}}$
298	$\lim_{x\to+\infty}\left(\frac{x+3}{x+2}\right)^{x}$	e
299	$\lim_{x\to 0}(1+x)^{\frac{7}{x}}$	e^7
300	$\lim_{x\to 0}(1+2x)^{\frac{1}{x}}$	e^2
301	$\lim_{x\to 0}(1+x)^{\frac{1}{3x}}$	$e^{\frac{1}{3}}$
302	$\lim_{x\to+\infty}(x+1)^{-\frac{1}{\ln x}}$	$\frac{1}{e}$
303	$\lim_{x\to 0}(1+2x)^{\frac{3}{x}}$	e^6

304	$\lim_{x\to 2} \frac{e^x - e^2}{x-2}$	e^2
305	$\lim_{x\to 0} \frac{x}{1-e^{3x}}$	$-\frac{1}{3}$
306	$\lim_{x\to 0} \frac{1-e^{4x}}{7x}$	$-\frac{4}{7}$
307	$\lim_{x\to 0} \frac{e^{3x}-1}{5x}$	$\frac{3}{5}$
308	$\lim_{x\to 0} \frac{4^x-1}{5^x-1}$	$\frac{ln4}{ln5}$
309	$\lim_{x\to 0} \frac{e^{3x}-1}{2^{5x}-1}$	$\frac{3}{5ln2}$
310	$\lim_{x\to 0} \frac{e^x - e^{-x}}{e^{2x}-e^{-2x}}$	$\frac{1}{2}$
311	$\lim_{x\to 0} \frac{5^{2x}-1}{x}$	$ln\,25$
312	$\lim_{x\to 0} \frac{2^{2x}-1}{3^x-1}$	$2\frac{ln\,2}{ln\,3}$
313	$\lim_{x\to 0} \frac{(1+2x)^4-1}{x}$	8
314	$\lim_{x\to 1} \frac{x-1}{e^x-e}$	$\frac{1}{e}$
315	$\lim_{x\to -2} \frac{e^{x+2}-1}{x+2}$	1

316	$\lim_{x\to 3} \frac{x-3}{lnx - ln3}$	3
317	$\lim_{x\to +\infty} \frac{5}{x}[ln(1+x) - lnx]$	0
318	$\lim_{x\to 0} \frac{ln(1+3x)}{x}$	3
319	$\lim_{x\to 0} \frac{ln(1+2x)}{ln(1+x)}$	2
320	$\lim_{x\to 0} \frac{log_3(1+x)}{2x}$	$\frac{1}{2} log_3 e$
321	$\lim_{x\to +\infty} \left(\frac{1}{2x}\right)^{\frac{1}{ln\,3x}}$	$\frac{1}{e}$
322	$\lim_{x\to 0} \frac{log_2(1+x)}{3^x - 1}$	$\frac{1}{ln\,2\,ln\,3}$
323	$\lim_{x\to 0} \frac{ln(1+x)}{3^x - 1}$	$\frac{1}{ln3}$
324	$\lim_{x\to +\infty} x\left(3^{\frac{1}{x}} - 1\right)$	$ln3$
325	$\lim_{x\to 0^+} \frac{(1+5x^2)^{\frac{3}{x^2}}}{5x+3}$	$\frac{e^{15}}{3}$
326	$\lim_{x\to \infty} \frac{1 - e^{\frac{1}{x}}}{ln\left(1+\frac{1}{5x}\right)}$	-5
327	$\lim_{x\to 0} \frac{ln(1+3x^2)}{2^{x^2} - 1}$	$\frac{3}{ln2}$
328	$\lim_{x\to 3} \frac{ln\,(x-2)}{e^x - e^3}$	$\frac{1}{e^3}$

esercizi di riepilogo di varie tipologie

329	$\lim_{x\to+\infty}(x^2-4x+1)$	$+\infty$
330	$\lim_{x\to0}\frac{\sin 3x}{3x}$	1
331	$\lim_{x\to-\infty}\frac{2x^3+4x^2-3x+5}{-2x^3+9x^2+3x-1}$	-1
332	$\lim_{x\to1}\frac{\ln x}{e^x-e}$	e^{-1}
333	$\lim_{x\to0}\frac{\tan x}{x}$	1
334	$\lim_{x\to0}\frac{5-5e^{3x}}{x}$	-15
335	$\lim_{x\to0}\frac{\sin 4x}{x}$	4
336	$\lim_{x\to+\infty}\frac{5}{2}\,x\sin\frac{1}{x}$	$\frac{5}{2}$
337	$\lim_{x\to0^+}\frac{\ln x}{x}$	$-\infty$
338	$\lim_{x\to+\infty}(-2x^2-2x+5)$	$-\infty$

339	$\lim_{x\to 0} \frac{\sin 5x}{x}$	5
340	$\lim_{x\to +\infty} \frac{x^2-3x^3+2x-1}{3x^2-4x^3+2x+8}$	$\frac{3}{4}$
341	$\lim_{x\to -\infty} (x+\sin x)$	$-\infty$
342	$\lim_{x\to +\infty} \left(\sqrt[5]{x}+2^{-x}\right)$	$+\infty$
343	$\lim_{x\to \infty} x \sin\frac{1}{x}$	1
344	$\lim_{x\to 0} \frac{\sin 4x}{7x}$	$\frac{4}{7}$
345	$\lim_{x\to +\infty} \frac{2x+\cos x}{3x-\sin x}$	$\frac{2}{3}$
346	$\lim_{x\to 0} \frac{\tan 3x}{x}$	3
347	$\lim_{x\to 2} \frac{2x^3-9x^2+12x-4}{x^3-x^2-8x+12}$	$\frac{3}{5}$
348	$\lim_{x\to 3^+} \frac{\log_2(x-3)}{5^{\arcsin(4-x)}}$	$-\infty$
349	$\lim_{x\to 0} \frac{\sin 120x}{6x}$	20

350	$\lim_{x\to 0}(3x\ cotx)$	3
351	$\lim_{x\to 0}\frac{sin\,8x}{tan\,2x}$	4
352	$\lim_{x\to 0}\frac{tan\,3x}{sin\,x}$	3
353	$\lim_{x\to 0}\frac{e^{sin\,x}-1}{2x}$	$\frac{1}{2}$
354	$\lim_{x\to+\infty}\frac{ln\,x+3)}{3\,ln\,x\ -1}$	$\frac{1}{3}$
355	$\lim_{x\to 0}\frac{e^{2x}-1}{x}$	2
356	$\lim_{x\to 0}\frac{e^{3x}-1}{sin\,5x}$	$\frac{3}{5}$
357	$\lim_{x\to 0}\frac{1-cos\,x}{x^2}$	$\frac{1}{2}$
358	$\lim_{x\to 0}\frac{e^{3x}-1}{sin\,5x}$	$\frac{3}{5}$
359	$\lim_{x\to 0}\frac{2x+sin\,x}{x}$	3
360	$\lim_{x\to 0}\frac{x\,tan\,x}{1-cos\,x}$	2
361	$\lim_{x\to 0}\frac{sin\,15x}{5x}$	3
362	$\lim_{x\to 0}\frac{x^2-x}{sin\,4x}$	$-\frac{1}{4}$

363	$\lim_{x\to 0} \frac{\sin\frac{x}{5}}{\log_3(1+x)}$	$\frac{\ln 3}{5}$
364	$\lim_{x\to 3^+} \arctan\frac{4}{3-x}$	$-\frac{\pi}{2}$
365	$\lim_{x\to 0^+} \ln 3x - \ln(\sin 5x)$	$-\ln\frac{5}{3}$
366	$\lim_{x\to 0} \frac{2}{3}\frac{\sin x\cos x - \sin x}{x^2}$	0
367	$\lim_{x\to 0} \frac{1-\cos(x^2)}{3x^2\sin^2 x}$	$\frac{1}{6}$
368	$\lim_{x\to 0} \frac{\ln(1-2x)}{\ln(1+5x)}$	$-\frac{2}{5}$
369	$\lim_{x\to 0} \frac{\ln(2-\cos x)}{3\sin^2 x}$	$\frac{1}{6}$
370	$\lim_{x\to 0} \frac{\tan x - \sin x}{2x^3}$	$\frac{1}{4}$
371	$\lim_{x\to 0} \frac{\sin x^3}{\sin^3 x}$	1
372	$\lim_{x\to 0} \frac{\sin 3\pi x}{\sin 2\pi x}$	$\frac{3}{2}$
373	$\lim_{x\to 0} \frac{x-2\sin x}{x+\tan x}$	$-\frac{1}{2}$
374	$\lim_{x\to 0} \frac{3\sin x}{x+\tan x}$	$\frac{3}{2}$

375	$\lim_{x\to+\infty} 2x[log_2(x+1) - log_2 x]$	$2\,log_2 e$
376	$\lim_{x\to2^+} arccos\frac{\sqrt{x-2}}{x+1}$	$\frac{\pi}{2}$
377	$\lim_{x\to2^-} arctan\frac{3}{x-2}$	$-\frac{\pi}{2}$
378	$\lim_{x\to+\infty} \frac{\sqrt{x+1}-\sqrt{x}}{\sqrt{x+3}-\sqrt{x+2}}$	1
379	$\lim_{x\to\infty} \left(1+\frac{1}{3x}\right)^{5x}$	$e\sqrt[3]{e^2}$
380	$\lim_{x\to0} \frac{ln(3+x) - ln\,3}{4x}$	$\frac{1}{12}$
381	$\lim_{x\to0} arcsin\frac{2x^2+3x+1}{x-1}$	$-\frac{\pi}{2}$
382	$\lim_{x\to+\infty} \left(1-\frac{2e}{x}\right)^{x}$	e^{-2e}
383	$\lim_{x\to0} \frac{-3\,sin\,x}{log_5(1+3x)}$	$-ln5$
384	$\lim_{x\to1} \frac{arcsin(1-x)}{\sqrt{e^x}}$	0
385	$\lim_{x\to0} \frac{1-cos\,6x}{5x^2}$	$\frac{18}{5}$
386	$\lim_{x\to0} \frac{sin^2\,x}{x}$	0
387	$\lim_{x\to+\infty} \frac{2\,ln^2x - 3lnx + 3}{5\,ln^2x - 6lnx + 1}$	$\frac{2}{5}$

388	$\lim_{x\to+\infty}\left(\frac{2x+1}{2x-5}\right)^{3x-1}$	e^9
389	$\lim_{x\to0}\frac{3\,sin^3x+x^3}{tan\,x-sin\,x}$	8
390	$\lim_{x\to0}\frac{sin\,x-x}{x^3}$	$-\frac{1}{6}$
391	$\lim_{x\to0}\frac{e^x-x-1}{x^2}$	$\frac{1}{2}$
392	$\lim_{x\to\infty}\left(1+\frac{5}{x}\right)^x$	e^5
393	$\lim_{x\to\infty}\left(1+\frac{1}{x}\right)^{2x}$	e^2
394	$\lim_{x\to-6^+}\frac{2x^2+8x-24}{72-2x^2}$	$-\frac{2}{3}$
395	$\lim_{x\to0}\frac{5\,cos\,x-5\,cos^2x}{4\,sin^2x}$	$\frac{5}{8}$
396	$\lim_{x\to0}\frac{tan\,x+sin\,x}{3x}$	$\frac{2}{3}$
397	$\lim_{x\to0}\frac{x\,arcsin\,7x}{1-cos\,4x}$	$\frac{7}{8}$
398	$\lim_{x\to0}\frac{\sqrt[5]{x+1}-1}{5x}$	$\frac{1}{25}$
399	$\lim_{x\to0}\frac{x^3}{sin^2\,x}$	0
400	$\lim_{x\to-5^+}\frac{x+5}{x^2+x-20}$	$-\frac{1}{9}$

401	$\lim_{x\to 0} \frac{x^2}{1-\cos x}$	2
402	$\lim_{x\to \infty} \left(1-\frac{1}{x}\right)^x$	$\frac{1}{e}$
403	$\lim_{x\to 0} \frac{3\sin x + 4x\cos x}{2\sin x - 3x\cos x}$	-7
404	$\lim_{x\to 0} \frac{\sin^2 x}{1-\cos^3 x}$	$\frac{2}{3}$
405	$\lim_{x\to +\infty} \left(1-\frac{3}{2x}\right)^x$	$e^{-\frac{3}{2}}$
406	$\lim_{x\to +\infty} \arccos \frac{5}{x+2}$	$\frac{\pi}{2}$
407	$\lim_{x\to 0^+} \frac{8}{\operatorname{arccot} x - \frac{\pi}{2}}$	$-\infty$
408	$\lim_{x\to 0} \frac{(1+x)^5 - 1}{x}$	5
409	$\lim_{x\to 0} \frac{2x + 3\sin x}{5\tan x}$	1
410	$\lim_{x\to \infty} \left(1+\frac{1}{2x}\right)^{2x}$	e
411	$\lim_{x\to 0} \frac{\sin 5x}{\sqrt[5]{x+1}-1}$	25
412	$\lim_{x\to +\infty} \left(\sqrt{x^3-3} - \sqrt{x^3+5}\right)$	0

413	$\lim_{x\to\infty}\left(1+\frac{3}{x}\right)^{x}$	e^3
414	$\lim_{x\to 0}\frac{\sqrt[3]{x+1}-1}{e^{2x}-1}$	$\frac{1}{6}$
415	$\lim_{x\to 0} x^{\frac{2}{\ln x}}$	e^2
416	$\lim_{x\to+\infty}\left(\sqrt{x^4-3x+1}-x^2\right)$	0
417	$\lim_{x\to 0}\frac{sin^2\,x+2x^2+x^3}{4\,x^2+5\,sin^2\,x}$	$\frac{1}{3}$
418	$\lim_{x\to-\infty}\frac{\sqrt{8x^{14}-3x^5+x^3-x^2+2}}{5x^4-x^2+x-5}$	$+\infty$
419	$\lim_{x\to\frac{\pi}{2}}\frac{1-cos^3\,x}{2\,sin^2\frac{x}{2}}$	1
420	$\lim_{x\to 1}\frac{2^{3x-3}-1}{3x^2+x-4}$	$\frac{3}{7}ln\,2$
421	$\lim_{x\to 0}\frac{x\,tan\,x}{ln(1+3x^2)}$	$\frac{1}{3}$
422	$\lim_{x\to 3}\frac{2^{x-3}-1}{x-3}$	$ln\,2$
423	$\lim_{x\to\frac{\pi}{2}}\frac{1-sin\,x}{2cos\,x}$	0
424	$\lim_{x\to+\infty}\frac{3x-2}{\sqrt{4x-1}+\sqrt{x+1}}$	$+\infty$

425	$\lim_{x\to 0} \frac{\pi^x - 3^x}{x}$	$ln\frac{\pi}{3}$
426	$\lim_{x\to -\infty} \left(\frac{x^3}{3x^2-4} - \frac{x^2}{3x+9}\right)$	1
427	$\lim_{x\to +\infty} \frac{x+\cos x}{\sqrt{x}-1}$	$+\infty$
428	$\lim_{x\to 3} \frac{2^{x-3}-1}{x-3}$	$ln\,2$
429	$\lim_{x\to +\infty} \frac{ln(3+\sin x)}{x^3}$	0
430	$\lim_{x\to 0} \frac{e^x - e^{-x}}{\sin x}$	2
431	$\lim_{x\to 0} \frac{ln(1+5x)}{e^{2x}-1}$	$\frac{5}{2}$
432	$\lim_{x\to 0^+} \frac{\sin 2x}{x\tan x}$	$+\infty$
433	$\lim_{x\to +\infty} \sqrt{x}\left(\sqrt{x+1}-\sqrt{x}\right)$	$\frac{1}{2}$
434	$\lim_{x\to 0^+} x^x$	1
435	$\lim_{x\to 0} \frac{e^{5x} - ln(ex+e)}{x}$	4
436	$\lim_{x\to 2} \frac{2x^3-5x^2-4x+12}{x^4-4x^3+5x^2-4x+4}$	$\frac{7}{5}$

limiti più impegnativi

437	$\lim_{x\to 0} \frac{(e^x-1)x\sin x}{(1-\cos x)\ln(1+x)}$	2
438	$\lim_{x\to 0^+} (\ln^2 x)^{\sin x}$	1
439	$\lim_{x\to +\infty} \frac{\ln x}{\ln \ln x}$	$+\infty$
440	$\lim_{x\to -\infty} (8x + x\sin^2 x)$	$-\infty$
441	$\lim_{x\to 0^+} \left(1+e^{\frac{1}{x^3}}\right)^{\sin x}$	$+\infty$
442	$\lim_{x\to 0^+} \frac{x\ln^5 x + \sqrt[4]{x}\ln x}{\sqrt{x}}$	$-\infty$
443	$\lim_{x\to +\infty} \frac{x^2-5x}{x+1}\left(e-2^{\sin x}\right)$	$+\infty$
444	$\lim_{x\to 0^+} x\ln^2 x$	0
445	$\lim_{x\to 0} \frac{\sqrt{2x^3}-x^6}{4x^6-\sqrt{x^4+x^3}}$	$-\sqrt{2}$
446	$\lim_{x\to +\infty} \left(3^{(x^2)}-(3^x)^2\right)$	$+\infty$
447	$\lim_{x\to 0^+} (1+\ln^2 x)^{\sin x}$	$+\infty$
448	$\lim_{x\to \pi} \frac{\cos x+1}{\cos 3x+1}$	$\frac{1}{9}$

449	$\lim_{x\to\frac{\pi}{3}} \frac{\tan x - \sqrt{3}}{1-\sqrt{3}\cot x}$	$\sqrt{3}$
450	$\lim_{x\to 0^+} \left(x^x + x^{-\frac{1}{x}}\right)$	$+\infty$
451	$\lim_{x\to 1} \frac{2^{3x-3}-1}{3x^2+x-4}$	$\frac{3}{7}\ln 2$
452	$\lim_{x\to 0} (1+\sin x)^{\csc x}$	e
453	$\lim_{x\to\infty} \left(1+\frac{4}{5x}\right)^{5x+1}$	e^4
454	$\lim_{x\to\frac{\pi}{2}} \frac{3\,sen^2x + senx - 4}{\left(x-\frac{\pi}{2}\right)^2}$	$-\frac{7}{2}$
455	$\lim_{x\to+\infty} \left(\sqrt[3]{x+1} - \sqrt[3]{x}\right)$	0
456	$\lim_{x\to 0} \frac{\ln(1+x^3)}{\sin x^2 \cdot (1+e^{2x})}$	0
457	$\lim_{x\to 0} \frac{\ln(1+5x) - \ln(1+x)}{\ln(1-x) - \ln(1-2x)}$	4
458	$\lim_{x\to\frac{\pi}{2}} \frac{(2x-\pi)\cos x}{x(1-\sin x)}$	$-\frac{8}{\pi}$
459	$\lim_{x\to\infty} \left(\frac{x^2}{x^2-2}\right)^{x^2-2}$	e^2
460	$\lim_{x\to 0} \frac{e^{2x^2} - \cos x}{\ln(1+9x^2)}$	$\frac{5}{18}$

461	$\lim_{x\to 1} \frac{e^{5x}-e^5}{sin(3\,ln\,x)}$	$\frac{5}{3}e^5$
462	$\lim_{x\to 0^+} x^{\frac{1}{ln^2 x}}$	1
463	$\lim_{x\to+\infty} \left(\frac{x-3}{x+4}\right)^{\frac{x^2-1}{2x}}$	$e^{-\frac{7}{2}}$
464	$\lim_{x\to 0} \frac{ln\,(1+3x)}{sin\,sin\,x}$	3
465	$\lim_{x\to 0} \frac{e^{sin\,2x}-e^{sin\,x}}{tan\,x}$	1
466	$\lim_{x\to 0} (1+tan^2 x)^{\frac{1}{x\,ln(x+1)}}$	e
467	$\lim_{x\to 0} \frac{sin\,x^2}{\sqrt[6]{1+x^2}-1}$	6
468	$\lim_{x\to+\infty} \left(\frac{1}{x}\right)^{-\frac{1}{1+ln\,x}}$	e
469	$\lim_{x\to\infty} \left(\frac{2x+1}{3+2x}\right)^{x-1}$	$\frac{1}{e}$
470	$\lim_{x\to\infty} \lvert x\rvert^{\frac{1}{ln\lvert x\rvert}}$	e
471	$\lim_{x\to+\infty} \left(\sqrt[3]{x^3+6x^2-3x+2}-x\right)$	2
472	$\lim_{x\to 0} \frac{\sqrt[4]{x+1}-1}{\sqrt[6]{x+1}-1}$	$\frac{3}{2}$

verifica i seguenti limiti del tipo $\lim_{x\to x_0} f(x) = l$ utilizzando la definizione

473	$\lim_{x\to 0}(4x+2)=2$
474	$\lim_{x\to 2}(2x-1)=3$
475	$\lim_{x\to 5}(2x-1)=9$
476	$\lim_{x\to 1}(3x^2-2)=1$
477	$\lim_{x\to 2}\frac{x}{4x-3}=\frac{2}{5}$
478	$\lim_{x\to 2}\frac{9x}{4x+1}=2$
479	$\lim_{x\to 1}\frac{2x+4}{2x-1}=6$
480	$\lim_{x\to 2}\left(\frac{x}{3}+2\right)=\frac{8}{3}$
481	$\lim_{x\to 2}\frac{x^2-4}{x+2}=0$
482	$\lim_{x\to 1^-}\sqrt{1-x}=0$
483	$\lim_{x\to 0}(2-\lvert 3x+2\rvert)=0$
484	$\lim_{x\to 2} log_3(2x-1)=1$
485	$\lim_{x\to \frac{\pi}{6}}(4\,sin\,x+1)=3$
486	$\lim_{x\to 0}(2-tanx)=2$

$-\frac{8}{\pi}$

verifica i seguenti limiti del tipo $\lim_{x\to\infty} f(x) = l$ utilizzando la definizione

487	$\lim_{x\to+\infty} \frac{x+4}{x+3} = 1$
488	$\lim_{x\to\infty} \frac{3x+1}{2x-3} = \frac{3}{2}$
489	$\lim_{x\to+\infty} \sqrt{\frac{3}{1+x}} = 0$
490	$\lim_{x\to-\infty} (3^x + 1) = 1$
491	$\lim_{x\to-\infty} \left(2 - e^{-x^2}\right) = 2$
492	$\lim_{x\to+\infty} sin\frac{1}{x} = 0$
493	$\lim_{x\to+\infty} sin\left(\frac{3}{1-x}\right) = 0$
494	$\lim_{x\to+\infty} \left[cos\left(\frac{5}{x}\right) + 1\right] = 2$
495	$\lim_{x\to-\infty} 2\, tan\frac{x+1}{x^2} = 0$
496	$\lim_{x\to-\infty} arctanx = -\frac{\pi}{2}$

verifica i seguenti limiti del tipo $\lim_{x\to x_0} f(x) = \infty$ utilizzando la definizione

497	$\lim_{x\to 3^+} \frac{6}{3-x} = -\infty$
498	$\lim_{x\to 2^-} \frac{x+4}{x-2} = -\infty$
499	$\lim_{x\to 2^+} \frac{3}{x-2} = +\infty$
500	$\lim_{x\to 0} \frac{1}{x^2} = +\infty$
501	$\lim_{x\to 2^+} \frac{7}{4-2^x} = -\infty$
502	$\lim_{x\to 0^+} \frac{2}{1-e^{2x}} = -\infty$
503	$\lim_{x\to 0^+} ln\ x = -\infty$
504	$\lim_{x\to -2^+} log_5(x+2) = -\infty$
505	$\lim_{x\to 0^+} ln(x+2x^2) = -\infty$
506	$\lim_{x\to 2^-} \frac{5}{2-x} = +\infty$
507	$\lim_{x\to 0^-} \frac{1}{x} = -\infty$
508	$\lim_{x\to 1^+} \frac{1}{x-1} = +\infty$
509	$\lim_{x\to 1^-} \frac{3x-2}{arcos\ x} = +\infty$
510	$\lim_{x\to \frac{\pi}{2}^+} tan\ x = -\infty$

verifica i seguenti limiti del tipo $\lim_{x\to\infty} f(x) = \infty$ utilizzando la definizione

511	$\lim_{x\to+\infty} (2x-1) = +\infty$
512	$\lim_{x\to-\infty} (5-x) = +\infty$
513	$\lim_{x\to+\infty} (3x^2-2) = +\infty$
514	$\lim_{x\to+\infty} (2x-3x^2) = -\infty$
515	$\lim_{x\to+\infty} (x^2-3x-1) = +\infty$
516	$\lim_{x\to+\infty} \sqrt{x+2} = +\infty$
517	$\lim_{x\to-\infty} \sqrt{2-4x} = +\infty$
518	$\lim_{x\to+\infty} \sqrt{3x^2+1} = +\infty$
519	$\lim_{x\to-\infty} \sqrt[3]{x-11} = -\infty$
520	$\lim_{x\to-\infty} log_{\frac{1}{5}}(1-x) = -\infty$
521	$\lim_{x\to-\infty} log_2(2x^2+1) = +\infty$
522	$\lim_{x\to+\infty} 2^{x+1} = +\infty$
523	$\lim_{x\to-\infty} \left(\frac{1}{2}\right)^{x-2} = +\infty$
524	$\lim_{x\to-\infty} 3^{3-x} = +\infty$