# Analisi Matematica 1 - Lista n. 8

Limiti su Confronti tra Infiniti

www.problemisvolti.it

I seguenti limiti possono essere calcolati senza usare teoremi non ancora disponibili nelle prime settimane del corso di Analisi Matematica 1, in particolare **SENZA** gli sviluppi di **TAYLOR** e **SENZA** la formula di **STIRLING**.

1) $$\lim_{n\to+\infty} \sqrt[n]{8^n+3^n} = 8$$

2) $$\lim_{n\to+\infty} \sqrt[n]{n^n+1} = +\infty$$

3) $$\lim_{n\to+\infty} \left(\frac{1}{\sqrt[n]{8}} + \frac{1}{\sqrt[n]{3}}\right)^n = +\infty$$

4) $$\lim_{n\to+\infty} \left(\sqrt[n]{8} - \sqrt[n]{3}\right)^n = 0$$

5) $$\lim_{n\to+\infty} \frac{2^{n+\sin n}+3^{n-1}}{100^{\sqrt{n}}+\left(3+\frac{1}{n}\right)^n} = \frac{1}{3}e^{-\frac{1}{3}}$$

6) $$\lim_{n\to+\infty} \frac{8^{\sqrt{n}}+\sqrt{4^n-1}}{2^n-3^{\frac{n+\sin n}{2}}} = 1$$

7) $$\lim_{n\to+\infty} \frac{2^{n+1}+n^2 4^{\ln n}-2^{n-3}}{\sqrt{4^n+3}+\sqrt{3^n+4}} = \frac{15}{8}$$

8) $$\lim_{n\to+\infty} \frac{(n+\sin n)^{10}+n^9\ln n}{n^{10}+\sqrt{n^{20}+1}+\ln(1+n^{100})} = \frac{1}{2}$$

9) $$\lim_{n\to+\infty} \frac{2\cdot n^{3n}+7n\cdot(2n)!+1000^n}{10^{3n}-(2n+1)!+(n+1)^{3n}} = \frac{2}{e^3}$$

10) $$\lim_{n\to+\infty} \frac{(n^2+1)\sqrt{n}+3n^2-\sqrt{n^5+1}}{\ln^2(n+e^n)+\sqrt[n]{n!+1}} = 3$$

11) $$\lim_{n\to+\infty} \frac{(n+1)^{n+\frac{1}{n}}+n!}{(n+2)^n-n^n} = \frac{e}{e^2-1}$$

12) $$\lim_{n\to+\infty} \frac{\left(\sqrt{n^n}+n^{\sqrt{n}}+(\sqrt{n})^n\right)^2}{(n+1)^n} = \frac{4}{e}$$

13) $$\lim_{n\to+\infty} \frac{(2^n\cdot n!+n^n)^2}{(2n)!+(n+1)^{2n}} = \frac{1}{e^2}$$

14) $$\lim_{n\to+\infty} \left(\frac{n^{n+1}+n}{n^{n+1}+\sqrt{n}}\right)^{(n+1)^n} = e^e$$

15) $$\lim_{n\to+\infty} \frac{\left(1+\frac{1}{n}\right)^{n!}+2^{n!}}{\left(2-\frac{1}{n^2}\right)^{n!}+\left(2+\frac{1}{n!}\right)^{n!}} = \frac{1}{\sqrt{e}}$$

16) $$\lim_{n\to+\infty} \frac{(n!)^{n+1}+((n+1)!)^n}{((n+1)!)^{n+\frac{1}{n}}+((n-1)!)^{n+2}} = 0$$

17) $$\lim_{n\to+\infty} \left(\left((n+9)^{100}+n^{98}\ln(n!)-n^{100}\right)\cdot\left(\sqrt{n^{199}+1}-\sqrt{n^{199}-1}\right)\right) = 0$$