I.1. $n \ln\left(\frac{3n+4}{3n-1}\right) = n \ln\left(\frac{5}{3n-1}+1\right) = n \ln\left[\left(1+\frac{5}{3n-1}\right)^{\frac{3n-1}{5}}\right]$

$\infty \cdot e^{\lim_{n\to\infty}} \quad \frac{5}{3n-1} \to 0 \qquad \infty \cdot 1 = \infty$?

2. $\sqrt[n]{\frac{n!}{n^n}} \qquad \frac{a_{n+1}}{a_n} = \frac{(n+1)\cancel{n!}}{(n+1)^{n+1}} \cdot \frac{n^n}{\cancel{n!}} = \left(\frac{n}{n+1}\right)^n \to \boxed{e^{-1}}$

$a_n := \frac{n!}{n^n}$

$\left[\left(1+\frac{-1}{n+1}\right)^{\frac{n+1}{-1}}\right]^{\frac{-1}{n+1}\cdot n} = e^{\frac{-n}{n+1}} \to -1.$
$= e^{-1}.$ ✓

I 1	1,5 ✓
2	1,5 ✓
II 1.	2 ✓
2	2
III 1.	2 ✓

$1+\frac{n}{n+1}-1$

II. 1. $\frac{n+1}{n} = \frac{1}{n}+1.$

III. a) $\lim_{x\to\infty}\left(\frac{10x-1}{2+10x}\right)^{\frac{x^2-1}{x}} = \lim_{x\to\infty}\left[\left(1+\frac{-3}{2+10x}\right)^{\frac{2+10x}{-3}}\right]^{\frac{-3}{2+10x}\cdot\frac{x^2-1}{x}} =$

$= e^{\lim_{x\to\infty}\frac{-3x^2+3}{10x^2+2x}} = e^{\frac{-3}{10}}.$

$\frac{\ln(1+y_n)}{y_n} = 1.$

$y_n \to 0.$

b) $\sin\frac{1}{n\sqrt[3]{n}}$

$x_n := \sin\frac{1}{n\sqrt[3]{n}}$; $\quad \frac{(x_n)}{\frac{1}{n\sqrt[3]{n}}} \to 1$

$\frac{3n+4}{3n-1} = 1+\frac{5}{3n-1}$

$\sin\left|\frac{1}{n\sqrt[3]{n}}\right| < n$

$\frac{\ln\left(1+\frac{5}{3n-1}\right)}{\frac{5}{3n-1}} \cdot \frac{5}{3n-1} \cdot n$

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II. 1. $\sum_{n\ge 1} \sin \frac{1}{n\sqrt[3]{n}}$

$$\frac{\sin \frac{1}{n\sqrt[3]{n}}}{\frac{1}{n\sqrt[3]{n}}} \to 1 \quad \Rightarrow \sum_{n\ge 1} x_n \sim \sum_{n\ge 1} y_n$$

$$y_n := \frac{1}{n\sqrt[3]{n}} < \frac{1}{n} \xrightarrow{\text{Cr. Comp 1}} \text{C}$$

$$\frac{1}{n^{\frac{4}{3}}} < \frac{1}{n} \to$$